NATURAL RESOURCE TECHNOLOGY
ENVIRONMENTAL CONSULTANTS

23713 W. PAUL ROAD, SUITE D
PEWAUKEE, WI 53072
(P) 262.523.9000
(F) 262.523.9001

Mr. Ross del Rosario
USEPA Region 5 – SR-6J
77 W. Jackson Boulevard
Chicago, Illinois 60604-3590

November 29, 2011
(1986)

RE: Site-Specific Work Plan – Revision 2 and
Response to USEPA Site-Specific Work Plan – Revision 1 Comments,
North Plant Site Former MGP Upland OU, Waukegan, Lake County, Illinois
North Shore Gas Company

CERCLA Docket No. V-W-'07-C-877
CERCLIS ID – ILD984807990

Dear Mr. del Rosario:

On behalf of Integrys Business Support, LLC (IBS), which manages the former North Plant Manufactured Gas Plant (MGP) site on behalf of North Shore Gas Company, Natural Resource Technology, Inc. (NRT) is submitting the Site-Specific Work Plan (SSWP) - Revision 2 for the above referenced site in Waukegan, Illinois. SSWP - Revision 2 incorporates responses to comments received from the United States Environmental Protection Agency (USEPA) regarding the June 30, 2011 SSWP - Revision 1.

This letter also provides specific responses to the September 21, 2011 USEPA comments on SSWP - Revision 1. The September 21, 2011 comment letter summarized USEPA's November 9, 2010 comments and NRT's December 22, 2010 responses as well. For ease of review, all USEPA comments are italicized and indented. The previous IBS response is not indented and the November 21, 2011 response is noted.

In addition to the comment responses below, USEPA has recently provided comments on other sites in the Multi-Site Program (e.g., Stevens Point, Marinette, North Station) regarding the use of the carcinogenic Regional Screening Level (RSL) for naphthalene and ethylbenzene. This is a significant programmatic change which is also included in SSWP – Revision 2. Thus, Figure 7 and the discussion in Sections 2.3.7 and 3.6.1 have been modified to reflect this change from SSWP – Revision 1.

General Comments:

1. *USEPA previously commented on November 9, 2010 that "Numerous documents that are referenced in the text are not included in the references section, such as NYSDEC, 2006; Morgan, 1931; Findlay, 1917; Lunge, 1916; United States Army Corps of Engineers, 1993; City of Waukegan, 2004. Please check all references throughout the document and include missing references in the reference section. "*

IBS responded on December 22, 2010 that "the references will be checked and included as appropriate"

Response: It does not appear that any of the requested references were added to the Revision 1 document. These references should be provided.

IBS November 2011 Response: The December 22, 2010 response to comments was developed assuming all of the references would be located. However, four of the six references could not be located. These references included: Morgan, 1931; Findlay, 1917; Lunge, 1916; and United States Army Corps of Engineers, 1993. Thus, statements attributed to these authors were confirmed by the use of other cited references, and these original references were removed.

The references for the New York State Department of Environmental Conservation (2006) and the City of Waukegan (2006) were both updated to 2011 and 2007, respectively. These modifications are reflected in SSWP – Revision 2 Sections 2 and 10.

2. *USEPA previously commented on November 9, 2010 to "Please number the tables within the text for ease in discussion".*

IBS responded on December 22,2010 that 'The tables will be numbered and identified to clarify the discussion in the text"

Response: It does not appear that any of the tables within the text were numbered and identified. For example Pages 32, 34, and 59 have tables but were not numbered and identified. This issue is not technically significant, but was noted as an item that was identified by ms as a revision, but was not subsequently modified •

IBS November 2011 Response: The four tables presented within the text have been referenced as Tables A through C (Section 3) and Table D (Section 6). These tables have not been referenced numerically to avoid confusion with the data tables presented as a separate section of SSWP – Revision 2.

Specific Comments:

1. *USEPA previously commented on November 9, 2010: "Section 3.1 - Please note the ditch that had 25,000 tons of impacted soil removed in 1968 and the location of the North Ditch that is referenced in Section 2.1 in one of the figures".*

IBS responded on December 22,2010 that 'There was a former ditch in the central portion of the site that was excavated as noted in Comment #9, and this ditch will be added to site drawings."

Response: It does not appear that the location of the former ditch/excavation area was added to any figures. This area should be added to a proper figure.

IBS November 2011 Response: The location of the former ditch in the central portion of the site has been identified through discussion with IBS personnel, and is shown on Figures 4, 6, and 12.

2. *It is noted that the inclusion of screening criteria in the new data tables has markedly improved the clarity of the report as it relates to an understanding of the nature and extent of contaminants at the site. This significant effort is appreciated.*

IBS November 2011 Response: As noted above, the screening levels have been updated to include the carcinogenic values for naphthalene and ethylbenzene.

3. *USEPA previously commented on November 9, 2010: "Section 3.2.2, Paragraph 8 states that two dewatering wells are located immediately east of the site, and that these wells could have an impact on the site. Please identify the locations of these wells on a map. Given this information please determine the specific depth of these wells, as well as pumping rates, pumping frequency, and other information that will help determine what effect dewatering efforts could have on the site groundwater contaminants. An additional evaluation of site groundwater flow during pumping periods and nonpumping periods might be necessary over an extended period (i.e. 30 days using pressure transducers and data loggers). If there is*

a potential for the dewatering wells to be remove contaminated groundwater from the site, please determine the location of the dewatering well discharge, and obtain results from well sampling activities, if possible".

IBS responded on December 22,2010 that "Information (well depth, operation, pumping rates/frequency, etc.) pertaining to the two dewatering wells has been requested from NSSD and will be included in the revised SSWP"

Response: A review of the last section of Section 3.2.2 in Revision 1 indicates that several wells are used for water level gauging at the NSSD facility, and one well (MW-2) is used for dewatering purposes. However, water level and pumping data are not recorded by NSSD, nor is there analytical data available for the wells. If future investigations at the site confirm that contaminants are migrating onto the NSSD facility, as is indicated on Figure 15, additional evaluation of the NSSD dewatering wells will be necessary, including determining the locations, pumping frequency and volume, and water quality.

IBS November 2011 Response: Available data received from the NSSD through a FOIA request was summarized in Section 3.2.2 of the SSWP-Revision 1. In SSWP – Revision 2 IBS has proposed pursuing additional information if groundwater impacts appear to extend to these wells.

4. *USEPA previously commented on November 9, 2010 that "Cyanide is listed as an analyte in the first row (of the table in section 3.7), but "total cyanide" is listed in rows below this. Are different cyanide analyses proposed?*

IBS responded on December 22,2010 that "The table will be clarified with respect to cyanide. Total cyanide will be analyzed in soil and sediment and available cyanide will be analyzed in surface water and groundwater"

Response: A review of the Revision 1 document did not identify any references to total or available cyanide in the unnamed table in Section 3.7, or elsewhere in the document. These analyses should be specified as indicated above.

IBS November 2011 Response: Total cyanide will be analyzed in soil (solid) samples and amenable cyanide will be analyzed in water (liquid) samples. This distinction has been clarified in Table B, Section 3.7.

5. *USEPA previously commented on November 9,2010 that "The CSM in Figure 13 lists "air" as a medium of concern with human inhalation potential, but air is not included in the list of media of concern. Given that there is visible tar on the surface of the site and contaminant volatilization is possible, please add air to the list of media of concern, and evaluate air from a risk perspective".*

IBS responded on December 22, 2010 that "Air will be added to the list of media of potential concern, consistent with the CSM Figure 13"

Response: A review of the Revision 1 CSM indicates that "air" was actually removed from the CSM Figure 16, and not specifically added into the text in Section 4.2 as its own media of potential concern. However, the text was modified to state "Soil Vapor (as it effects air quality)". This deviation from the December 22, 2010 response should be explained, as well as the removal of air as a secondary media of concern in the CSM. Please describe how potential air issues will be evaluated from a risk perspective. This comment also applies to the next item #6.

IBS November 2011 Response: Additional discussion has been included in Section 4.2 to clarify that the risk associated with ambient air quality will be assessed as discussed in Section 4.3. Within Section 4.3 of SSWP Revision 1 the pertinent exposure pathways related to ambient air quality for each of the human receptors were incorporated to address soil and groundwater contamination. Air has been included explicitly as a secondary media in the CSM figure again by including a box for this media as was done in Revision 0. The rows incorporated into the Revision 1 version of the CSM figure that were added to refer to the inhalation pathway associated with surface soil, subsurface soil, and groundwater have been retained. Removing air as a secondary media in the Revision 1 version of the CSM figure was not intended to indicate the media would not be evaluated in the risk assessment. The soil and groundwater RSLs that will be used in the human health risk assessment are developed incorporating the inhalation route of exposure. Therefore by using the soil and groundwater RSLs for the screening level human health risk assessment, the inhalation of chemical vapors and chemicals adhered to particulate matter in ambient air will be addressed in the risk assessment.

6. *6. USEPA previously commented on November 9, 2010 that "Section 4.3.1, Paragraph 2- This paragraph identified inhalation of soil as a potential exposure pathway for industrial/commercial workers. Particulate exposure via fugitive dust generation and volatilization from surface and subsurface impacts might occur and must be included on the CSM and in the HHRA. Please add the inhalation pathway to Figure 13 for surface and subsurface soil to accurately reflect the site specific exposure pathways. Both particulate and volatilization exposures must be added to inhalation for the •construction worker and recreational receptors under Sections 4.3.2 and 4.3.3".*

IBS responded on December 22,2010 that "The CSM, Figure 13, includes both surface and subsurface soil as a primary media with arrows to air as a secondary media, and inhalation marked as a complete pathway for industrial/commercial worker, construction worker, and recreational visitor. The figure correctly incorporates the pathways and exposures specified. As noted in Figure 13, the level of evaluation for each pathway will be dependent on site conditions."

Response: A review of the Revision 1 CSM indicates that "air" was actually removed from the CSM Figure 16, despite the response that stated that the Figure 13 "correctly incorporates the pathways and exposures specified." However, the CSM table was modified to show an inhalation pathway for soil and subsurface soil receptors. As noted above, this deviation from the December 22, 2010 response should be explained, as well as the removal of air as a secondary media of concern in the CSM.

IBS November 2011 Response: Please refer to the Response for Comment 5.

7. *USEPA previously commented on November 9, 2010 that "Section 4.4.3, Paragraph 1, Sentence 2 - Please specify the approximate depth of the pond. Note that the presence of a high-density polyethylene (HDPE) liner that prohibits connection with shallow groundwater does not have a bearing on whether fish might be present in the pond. If the pond will remain as a site feature after any future remedial efforts, please evaluate aquatic pathways including fish and benthic organisms from an ecological risk perspective. If any fish are found to be of edible size, please include them in the HHRA ".*

IBS responded on December 22,2010 that "This section will include further discussion of the water depth on the former Waukegan Tar Pit, reference to the biological habitat assessment (Appendix D of the SSWP), and rationale that the pond is not expected to support fish. The screening level ecological risk assessment will provide a clear rationale of the aquatic pathways to be evaluated and potential ecological receptors exposed to the surface water and sediments of the former Waukegan Tar Pit."

Response: A review of the newly revised Section 4.4.4 (formerly Section 4.4.3) does not indicate that the depth of the pond has been (or will be) evaluated or that any changes have been made to this section. Please describe how pond depth and aquatic pathways will be evaluated from a risk perspective.

IBS November 2011 Response: Recent evaluation of the pond indicates a thin layer of solids (soil and air-borne particles) have accumulated on the top of the Waukegan Tar Pit liner. This material appears to range from approximately 1/8 inch to three inches thick near the edges and in the center of the pond, respectively. Based on the apparent deposition of this material and the pit liner, sediment samples cannot be collected using conventional sediment sampling methods (due to the apparent lack of cohesion and the presence of the liner, which cannot be punctured). Water depths in the pond were estimated at 4 to 6 feet deep during the November 18, 2008 Habitat Assessment (Appendix D of the SSWP). The recent evaluation estimated water depths range between three and four feet in the center. Sections 4.2.3 and 6.6 include a discussion of the pond and sediment issues and an assessment to further evaluate the presence of fish.

8. *A review of the newly revised Section 6.5.2 (formerly Section 6.7.2) indicates that water table and deeper piezometer wells (at the sand/clay interface) are proposed to be installed in well nests. However, page 61 of the SSWP (two paragraphs at top of page) describes possible circumstances when either the water table or deeper piezometer will not be installed based on observations made during drilling. This approach does not account for the potential for changing conditions and future migration of site contaminants to new locations. Based on the occurrence of various contaminants in groundwater across the site (as shown on Figure 15), it is recommended that the water table and piezometer well network proposed in the SSWP be installed regardless of whether impacts are noted at the time of drilling. This will provide a perimeter well network (on the north, west, and east sides of the former MGP site), that will more effectively monitor possible groundwater quality changes over time. A discussion of the south side of the former MGP site is included in the next comment.*

IBS November 2011 Response: Monitoring well nests (consisting of a water well and piezometer) will be installed in all identified well locations (Figure 17). This approach eliminates the need to determine whether a monitoring well or piezometer is appropriate at a particular location based on field observations. Language referring to installation of either a monitoring well or piezometer has been removed from Section 6.5.2.

9. *It is noted that Revision #1 of the SSWP contains ten fewer permanent monitoring well installations (5 fewer nested pairs) than were proposed in Revision #0, with an alternate approach to collect groundwater screening samples on Parcel #3 at 3 locations as shown on Figure 17. The groundwater screening approach may be applicable to some areas of Parcel #3. However, an evaluation of the existing groundwater quality data on Figure 15 indicates that there are known exceedances of screening criteria at the southeast comer of Parcel #1 for metals, SVOCs, and benzene in the existing MW -15 well nest. Therefore, it is recommended that at least one permanent monitoring well nest be installed to the south of Parcels #1 and #2 to attempt to define the plume limits. The decision to select the permanent monitoring well nest location may be made after collecting and analyzing the groundwater screening samples on Parcel #3. However, at least one permanent monitoring well nest is recommended to be installed to the south of Parcels #1 and #2 for plume delineation purposes. In addition, based on the easterly groundwater flow and the known impacts at location MW -15, it is suggested that a permanent monitoring well nest location be installed to the east/southeast of location MW •15 (on EJ &E or NSSD property). Please provide a revised groundwater monitoring approach based on the comments provided in items #8 and #9.*

IBS November 2011 Response: A proposed well nest has been included in the northeast corner of Parcel 3, and Figure 17 has been modified to include this location.

The number of monitoring wells and soil borings has been reduced from SSWP – Revision 0. Reduction in the overall number of monitoring wells and soil borings had been discussed with the previous USEPA RPM. Reduction of the soil samples is discussed in the December 22, 2010 response to comment 18. The determination to reduce the overall number of wells was based on a review of the groundwater data. Only one round of sampling (August 2004) has been completed, and site conditions may differ significantly from those documented in the report. As discussed in Section 6.5.3, low flow sampling methods will be used to provide representative groundwater quality data. These data will be reviewed and additional groundwater monitoring wells may be installed as discussed in Section 6.5.5 to define the groundwater plume, if necessary. .

10. *It is noted that Revision #1 of the SSWP contains significantly fewer surface soil samples than Revision #0. In particular, there are no surface soil samples proposed for Parcel #3 in revision #1, while Revision #0 had 28 surface soil samples proposed for Parcel #3. Section 3.6.1 of Revision #0 (second paragraph) stated that "Although it is unlikely that tar is present on Parcel 3, surface and subsurface soil should be investigated to demonstrate that response actions may not be necessary". Please describe the rationale for removing surface soil sampling from Parcel #3 in Revision #1, and describe how potential surficial impacts from former MGP operations on Parcel #3 will be evaluated.*

IBS November 2011 Response: Please refer to the response for comment 9 regarding the quantity of surface soil samples. Surface soil samples will be collected from Parcel 3 as discussed in Section 6.4.1 and shown on Figure 17. Sample locations identified as “surface soil” on-site (Parcels 1, 2, and 4) only extend to a depth of one foot (1’) below ground surface (bgs). However, all other soil borings to be completed on or around the site include soil samples from the 0-1 foot depth interval (thus, a “surface soil” sample). In summary, there will be seven surface soil samples collected from Parcel 3 and the area to the east (EJ&J property), as shown on Figure 17. This is an appropriate sample quantity to evaluate surface soil quality on this parcel given the lack of MGP residuals or structures identified on Parcel 3 (Section 6.4.1). In addition, the majority of Parcel 3 surface soil is not accessible because the City uses the parcel for managing community yard waste (i.e., there are large piles of mulch/compost). .

Please contact Mr. Naren Prasad of IBS at 312.240.4569 if you should have any questions regarding the responses to these comments or revisions in SSWP – Revision 1.

Sincerely,

NATURAL RESOURCE TECHNOLOGY, INC.

Eric P. Kovatch PG
Senior Hydrogeologist

Jennifer M. Kahler, PE
Senior Engineer

Enclosures: SSWP – Revision 2, November 29, 2011 (2 hard copies w/ CDs)

cc: Mr. Doyle Wilson, IEPA (1 hard copy w/ CD)
Mr. David Klatt, CH2M Hill (1 hard copy w/CD)
Mr. Brian Bartoszek, Integrys Business Support, LLC (1 CD copy)
Mr. Naren Prasad, Integrys Business Support, LLC (1 CD copy)

[File:\1986_SSWP Rev2_Response to USEPA SSWP Rev 1 comments 111129.doc]

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Site-Specific Work Plan

North Plant Site
Waukegan, Illinois

Project No: 1986

Revision 2
November 29, 2011

NATURAL RESOURCE TECHNOLOGY

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23713 W. PAUL ROAD, SUITE D
PEWAUKEE, WI 53072
(P) 262.523.9000
(F) 262.523.9001

SITE-SPECIFIC WORK PLAN

NORTH PLANT SITE
WAUKEGAN, ILLINOIS

Project No. 1986

Prepared For:

North Shore Gas Company
130 East Randolph Drive
Chicago, Illinois 60601

Prepared By:

Natural Resource Technology, Inc.
23713 West Paul Road, Suite D
Pewaukee, WI 53072

Revision 2
November 29, 2011

Eric P. Kovatch, PG, PH
Senior Hydrogeologist

Jennifer M. Kahler, PE
Senior Engineer/Project Manager

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FIGURES

TABLES

APPENDICES (INCLUDED ON ENCLOSED CD)

ACRONYMS

AOC	Administrative Order On Consent
ARARs	Applicable or Relevant and Appropriate Requirements
ASTM	American Society for Testing and Materials
Barr	Barr Engineering Company
Bgs	Below Ground Surface
BERA	Baseline Ecological Risk Assessment
BLRA	Baseline Risk Assessment
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CFR	Code of Federal Regulations
cm/sec	Centimeter per second
COCs	Constituents of Concern
COPCs	Contaminants of Potential Concern
CSM	Conceptual Site Model
DLs	Detection Limits
DNAPL	Dense Non-Aqueous Phase Liquid
DOT	Department of Transportation
DQOs	Data Quality Objectives
EDR	Environmental Data Research Inc.
EJ&E	Elgin, Joliet and Eastern
ERAGS	Ecological Risk Assessment Guidance For Superfund
ft^3	Cubic Feet
FEMA	Federal Emergency Management Administration
FS	Feasibility Study
FSP	Field Sampling Plan
GIS	Geographic Information System
HASP	Health and Safety Plan
HSA	Hollow-Stem Auger
IAC	Illinois Administrative Code
ID	Inside Diameter
Illinois EPA	Illinois Environmental Protection Agency
LNAPL	Light Non-Aqueous Phase Liquid
mg/kg	Milligrams per Kilogram
mg/L	Milligram per liter
MGP	Manufactured Gas Plant
MNA	Monitored Natural Attenuation
MSL	Mean Sea Level
NAPL	Non-Aqueous Phase Liquid
NCP	National Contingency Plan
NFR	No Further Remediation
NSSD	North Shore Sanitary District

OSI	Off-site Investigation
OSR	Off-site Rule
O&M	Operation and Maintenance
PAHs	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
POTW	Publicly Owned Treatment Works
PQLs	Practical Quantitation Limits
PVOCs	Petroleum Volatile Organic Compounds
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RACR	Remedial Action Completion Report
RAF	Risk Assessment Framework
RAO	Remedial Action Objective
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation and Feasibility Study
RLs	Reporting Limits
ROD	Record of Decision
ROR	Remediation Objectives Report
SARA	Superfund Amendments and Reauthorization Act
SI	Site Investigation
SLERA	Screening Level Ecological Risk Assessment
SOP	Standard Operating Procedure
SOSI	Supplemental Off-site Investigation
SOW	Statement of Work
SRP	Site Remediation Program
SSI	Supplemental Site Investigation
SSLs	Soil Screening Levels
SSWP	Site Specific Work Plan
STAT	STAT Analysis Corporation
SVOC	Semi-Volatile Organic Compounds
TACO	Tiered Approach to Corrective Action Objectives
TBC	To Be Considered
TCL	Target Compound List
TICs	Tentatively Identified Compounds
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbon
TRIS	Toxic Chemical Release Inventory System
UCL	Upper Confidence Limit
USACOE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
VOCs	Volatile Organic Compounds

1 INTRODUCTION

1.1 Purpose

This Site-Specific Work Plan (SSWP) describes the procedures to be followed and tasks necessary to complete the Remedial Investigation and Feasibility Study (RI/FS) at the North Plant Site, pursuant to the Administrative Order on Consent (AOC) and Statement of Work (SOW), Comprehensive Environmental Response Compensation and Liability Act (CERCLA) Docket No. V-W-'07-C-877, effective July 23, 2007. The AOC/SOW addresses two North Shore Gas Company (North Shore Gas) former manufactured gas plant (MGP) Sites. This SSWP addresses the North Plant Site. The North Plant Site (the 'Site') is comprised of three Parcels (Parcels 1, 2, and 4). North Shore Gas currently owns Parcels 1 and 2, the City of Waukegan currently owns Parcel 3, and the EJ&E Railroad currently owns Parcel 4. Under the AOC/SOW, a generic approach to addressing the two sites is to be developed (the Multi-Site approach), which, in turn, has and will be modified to account for site-specific differences that may exist at a particular location.

As discussed in this SSWP, substantial investigation activities were previously performed at the Site. This SSWP builds upon previously collected data and information, as well as other information contained in various reports and documents obtained. This SSWP was prepared in accordance with applicable federal statutes and regulations, including CERCLA (or Superfund) as amended by the Superfund Amendment and Reauthorization Act (SARA), 42 U.S.C. § 9601, et.seq. and the National Contingency Plan (NCP), contained in Title 40 of the Code of Federal Regulations, Part 300 (40 CFR 300).

1.2 Objectives

MGP-residual non-aqueous phase liquids (NAPL) or solids were identified in many areas on the Site during several Site investigations (SIs). Limited actions have occurred as well. Many of the SI activities were conducted pursuant to the Illinois Environmental Protection Agency (Illinois EPA) Site Remediation Program (SRP). A removal action was conducted pursuant to a United States Environmental Protection Agency (USEPA)-issued Administrative Order. This SSWP specifies the procedures to be used for identifying and evaluating the nature and extent of MGP residuals in surface and subsurface soil as well as groundwater for use in a Baseline Risk Assessment and FS. The BLRA will evaluate if the Site presents a risk to human health and/or the environment. The SSWP also sets forth the process to be used to develop and evaluate remedial alternatives.

Previous investigators have used “tar” to describe both MGP-residual NAPL and solids. Thus, the term tar may indicate a light or dense NAPL (LNAPL or DNAPL) that is present in the water column, a desiccated material similar to road-tar that cannot flow and has little potential to migrate, or even staining present in subsurface soils, whether above or below the water table. Investigation activities described herein will use a methodology to describe the MGP-residual NAPL and solids in a consistent manner that better conveys the physical state of the material and overall potential for contaminant migration.

2 SITE BACKGROUND AND SETTING

For the purposes of this document, the following definitions are used herein:

- North Plant Parcel 1 – Property formerly occupied by all the MGP structures and is currently owned by North Shore Gas. Parcel 1 is bounded by Dahringer Road to the north, Pershing Road to the west, North Plant Parcel 2 (defined below and also owned by North Shore Gas) to the east, and North Plant Parcel 3 (defined below and owned by the City of Waukegan) to the south. North Plant Parcel 1 is currently vacant.

- North Plant Parcel 2 – Property owned by North Shore Gas that was never occupied by MGP structures. Parcel 2 is bounded by Dahringer Road to the north, Parcel 1 to the west, Parcel 4 and the Elgin, Joliet & Eastern (EJ&E) Railroad to the east, and EJ&E Railroad property to the south. The majority of the Waukegan Tar Pit lies on Parcel 2 and wetlands have been identified. Parcel 2 is currently vacant.

- North Plant Parcel 3 – Property formerly owned by North Shore Gas (currently owned by the City of Waukegan) that was never occupied by MGP structures. Parcel 3 is bounded on of the north by Parcel 1, Pershing Road to the west, property owned by A. L. Hansen Manufacturing to the south, and EJ&E Railroad property to the east. The property is currently used by the City of Waukegan for stockpiling yard waste and asphalt grindings.

- North Plant Parcel 4 – Property owned by EJ&E Railroad that contains the remainder of the Waukegan Tar Pit and was never occupied by MGP structures. North Plant Parcel 4 is bounded by Dahringer Road to the north, Parcel 2 to the west and EJ&E Railroad tracks to the east. Beyond the tracks lies the North Shore Sanitary District (NSSD) Facility. The property is in the shape of a triangle and is currently vacant.

- EJ&E Railroad – Refers to the active EJ&E Railroad tracks located east of the Former North Plant MGP and west of the NSSD Treatment Facility.

- North Shore Sanitary District (NSSD) – Refers to the active wastewater treatment facility east of the former North Plant MGP and EJ&E Railroad.

- Site – Areas where impacts to environmental media associated with the Former North Plant MGP are present. At this time these areas include Parcels 1, 2 and 4. No known SI activities have been conducted on Parcel 3 to date.

2.1 Site Description and Current Conditions

The North Plant Site is located at 849 Pershing Road, southeast of the intersection of Pershing Road and Dahringer Road in Waukegan, Lake County, Illinois. Figure 1 is a Site Location Map. The North Plant Site, comprised of four parcels, is bounded to the north by Dahringer Road, to the west by Pershing Road, to the east by property owned by the EJ&E Railroad and to the south by property owned by A.L. Hansen Manufacturing Company.

Figure 2 shows the current Site layout and shows the boundaries of the four parcels. The Site encompasses between 20 and 21 acres. Zoning information for the Site and surrounding area is presented on Figure 3. According to the City of Waukegan Zoning District Map[1], property east of Pershing Road is zoned "I2 – General Industrial" except for a strip of land along Lake Michigan. The Former North Plant MGP historical structures are shown on Figure 4. Locations of existing underground and overhead utilities on and near the property are presented in Figure 5.

As discussed previously, Parcels 1 and 2 are owned by North Shore Gas and are currently vacant and undeveloped. Parcel 1 is approximately 12 acres and Parcel 2 is approximately 4 acres and contains the majority of the Waukegan Tar Pit. Parcel 3 is approximately 4 acres and Parcel 4 is approximately 0.6 acres, owned by EJ&E Railroad and includes the remainder of the Waukegan Tar Pit. The City of Waukegan (2007) plans to develop the Site and surrounding areas into open space recreational use.

Off-site surface water bodies closest to the North Plant Site include the intermittent or seasonal North Ditch, which lies approximately 800 feet to the east-southeast, Waukegan Harbor, which lies approximately 2,000 feet southeast of the Site and Lake Michigan, which lies approximately 3,200 feet east of the Site.

Site location and identification information is summarized below.

Former MGP Operator:	The North Shore Gas Company Contact: Naren Prasad 130 East Randolph Drive, 22nd Floor Chicago, Illinois 60601-6207
Parcel 3 Property Owner:	The City of Waukegan Ron Laubach (City Engineer) 100 N. Martin Luther King Jr. Ave. Waukegan, IL 60085
Parcel 4 Property Owner:	EJ&E Railroad Andrew Thiros (Attorney – Environmental) U.S. Steel Corporation 600 Grant Street Suite 1500 Pittsburgh, PA 15219-2800

[1] http://www.waukeganweb.net/Web%20Page%20Revised/Zoning%20Map_2007

Facility Location:	T45N, R12E, Section 15 849 Pershing Road Waukegan, Illinois Lake County
USEPA ID:	ILD984807990
Illinois EPA ID:	0971900063

The majority of the Site is covered with vegetation and is relatively flat. Surface water runoff in some of the surrounding areas is collected in City of Waukegan combined sewer system storm sewers. Surface water on the North Plant Site that does not infiltrate into the ground generally flows to the east side of the Site. Natural surface water runoff is primarily influenced by local and Site topography. Based on recent Site reconnaissance activities on Parcels 1 and 2, no storm sewer catch basins were identified.

2.2 Site History

The following sections provide a general history of the operation of MGPs followed by information specific to the former North Plant MGP. The general history is presented to develop an understanding of the processes, input materials, by-products and output materials. It also explains the differences between the various gas production methods that were used.

2.2.1 History of MGPs

MGPs were industrial facilities that produced gas from coal, oil and other feedstock. MGPs began operating in the United States (US) in the early 1800s as settlement and population centers expanded throughout the country. Initially, manufactured gas was used for street lighting prior to the introduction of electricity. By 1900, production had greatly increased in urban centers and manufactured gas was widely used. Gas was produced and stored on the MGP property and then piped to the surrounding area for use in lighting, cooking and heating homes and businesses before electricity and natural gas were commercially available.

Following the end of World War II, MGPs were generally phased out as interstate pipelines provided natural gas distribution from the Midwest throughout the country. According to the web page titled G*eneral Information About MGPs,* (New York State Department of Environmental Conservation [NYSDEC], 2011), natural gas replaced manufactured gas as the fuel of choice because it was both cheaper to provide and cleaner to burn.

During this period of transition, MGPs were often converted to combine manufactured and natural gas into "reformed natural gas" before final decommissioning. Although good records were kept during plant operation, less information is available regarding the disposition of assets and structures after the plants were closed. In general, the structures were "abandoned in place," the sites were razed, and, in many instances, new facilities were built on top of the old ones.

2.2.2 Gas Production Methods

Gas was produced by various means including the coal carbonization (coal gasification), carbureted water gas, and oil gas processes. In general, a coal feedstock was heated in an airtight chamber, called a retort or beehive oven, which kept the coal from completely combusting by limiting the amount of air that could enter the retort. This caused the feedstock to decompose into gas, tar and coke. Volatile aromatic hydrocarbons were driven off the gas, which was then collected, cooled and purified before distribution (NYSDEC, 2011).

The coal carbonization (CC) process used coal as the feedstock. The carbureted water gas (CWG) method later became popular because it produced a gas mixture that burned hotter and brighter than gas produced using CC (NYSDEC, 2006). A variety of water gas processes were developed, but in general they shared these common process steps, including:

- Heating of the coal in a closed retort, similar to CC;
- During the heating process, steam was injected into the retort, and a chemical reaction occurred that produced a flammable gas mixture of methane and carbon monoxide; and
- Liquid petroleum hydrocarbons were sprayed into the hot gas mixture, and this created additional methane, as the hydrocarbon chains were "cracked" by the high temperature (a similar "cracking" procedure is used today to convert crude oil into the constituents that comprise gasoline). The "cracking" procedure increased the heating and lighting potential of the gas (NYSDEC, 2011).

Reformed gas was a mixture of either natural gas or refinery oil gas with coal gas, blue gas or carbureted blue gas (i.e., CWG). Due to the high British Thermal Unit (BTU) value of both refinery oil gas and natural gas relative to manufactured gases, reformed gas was produced to meet a variety of heating specifications. Reformed gas generated essentially no residuals or by-products and no waste products; however, if the process was carried out at a Site where CC or CWG was produced, the same products as mentioned above would remain as residuals.

2.2.3 Waste and By-Products

Production of manufactured gas created a number of different by-products and wastes such as coke, coal tar, ammonia and various light oils. The by-products would separate from the gas at various points in the cooling, purifying, storage and distribution processes; the materials were then collected and stored on the facility. Early MGP production recognized the use of coke in the iron smelting and metallurgical industries. Similarly, coal tar became a fundamental raw-material or additional ingredient in numerous industrial processes and products.

Other MGP by-products included purifier wastes, which were comprised of either lime or wood chips (treated with iron oxides) that were was used to remove cyanide and sulfur from the coal gas. Once the purifying material had become saturated with impurities, this material was either discarded on the property as fill or reprocessed to recover the sulfur. Purifier wastes may have contained complex cyanide compounds and could generate strong, objectionable odors when exposed at the ground surface (NYSDEC, 2011).

2.2.4 North Plant History

The history of the Site and surrounding areas was developed using a variety of tools including Sanborn® maps, aerial photos, database searches, facility records and historical information about the infrastructure in the area of the Site.

2.2.4.1 Sanborn Maps, Topographic Maps and Aerial Photos

Sanborn maps, historic topographic maps, and historic aerials were reviewed to develop Site history and provide insight into past activities that may have influenced current conditions both on-site and within the surrounding area. Available Sanborn maps from 1917 through 1969 showed numerous former MGP structures, as well as a variety of businesses and industrial operations in the surrounding area (Appendix A1, enclosed CD). Historic topographic maps are from 1908 through 1998 (Appendix A2, enclosed CD). Historical aerial photographs of the Site from 1939, 1946, 1958, 1964, 1970, 1974, 1975, 1980, 1985, 1990, 1995, 2000, 2002, 2004, 2005, 2006 and 2007 were reviewed (Appendix A3, enclosed CD). Based on review of these historic documents, former MGP structures are shown on Figure 4 and include:

- Two gas holders with capacities of 1.5 million cubic feet (ft^3) and 200,000 ft^3;
- Compressor plant;
- Concrete oxide pits;

- Three weak liquid steel tanks of unknown volume;
- Cement mixing area;
- Oil tank of unknown volume;
- Coke bins;
- Retorts;
- Two oil tanks of unknown volume;
- Two tar pits of unknown volume (the one on the northeast side is the former Waukegan Tar Pit while the one to the south was documented by Dames and Moore in 1995 and is unrelated to Waukegan Tar Pit site);
- Propane tanks of unknown volume;
- Locker room/machine shop;
- Boiler room;
- Purifying tanks of unknown volume;
- Generator house;
- Coke pile;
- Cooling coils;
- Regulator house; and
- Meter storage building/meter house.

The 1939 aerial shows an aboveground gas holder, boiler room, stack, generator house, purifier boxes and a locker room/machine shop in the northwest portion of the Site. In the central portion of the Site, an aboveground gas holder, purifier house, compressor plant, meter house, purifying room, coke bins, boiler room, and possible storage tanks are present. There is an aboveground oil tank present in the northeast portion of the Site. The 1946 aerial shows the same features as the 1939 aerial with the addition of retorts, storage and various aboveground tanks in the central portion of the Site. The aerial photographs from 1958 and 1964 show the following additional features: aboveground propane tanks in the central portion of the Site and whitish-gray fill located through much of Parcel 2, however, the retorts, boiler room and storage building in the central portion of the Site are no longer present. In addition, a historical ditch from which soils were excavated in 1968 appears on the 1958/1964 photographs, and this ditch is shown on Figure 4 and 6. The gas holder was removed between 1964 and 1970.

Also, according to other sources of historical property use in the area, the whitish-gray fill is believed to be gypsum that was reportedly dumped in the area by the EJ&E Railroad.

The 1970 aerial photograph shows no buildings on the Site, except for a small square building along the western boundary and several aboveground storage units in the southern portion of Parcel 1. The gypsum dumping area on Parcel 2 appears to have expanded but a non-vegetated area located in the approximate location of the Waukegan Tar Pit Site is present. The 1974 and 1975 aerial photographs do not show the storage units on the south portion of Parcel 1 or the building along the western Site boundary, but two storage units are located in the northwestern corner of the Site. The 1980 aerial photograph shows that the size of the non-vegetated area on Parcel 2 has been reduced and additional whitish-gray fill appears. The 1980 aerial photograph also shows storage units located in the southwestern portion of Parcel 1. The 1985 aerial photograph shows no significant change from the 1980 aerial photograph other than additional vegetation throughout the Site, and storage units are located further to the south on Parcel 3. The 1990 aerial photograph does not show any significant change from the 1985 aerial photograph. The 1995, 2000 and 2002 aerial photographs shows the current shape of the Waukegan Tar Pit and no above ground features other than vegetation are present. The 2004 aerial photograph shows no significant change from the 2002 aerial photograph except for the addition of gravel roads and gravel areas. The gravel area on Parcel 1 is related to a limited excavation conducted in 2003. Similarly, the 2005, 2006 and 2007 aerial photographs do not show significant change from the 2004 aerial photograph, except for the addition of a silt fence near the wetlands in Parcel 2, etchings of test pits across the Site, and a storage container near the northern gate.

Off-site historical uses of surrounding properties include the following:

- Griess-Pfleger Tanning Company formerly owned and operated on the property north of Dahringer Road between approximately 1917 through 1973. This property currently has no structures and is vacant. This property was the subject of an Illinois EPA Site Remediation Program (SRP) voluntary cleanup performed by Commonwealth Edison. The property received Section 4(y) and No Further Action letters.

- The American Polystyrene Company facility (formerly the Pacific Steel Boiler Corporation) was located on the adjacent property to the northeast. This property was used for industrial purposes from before 1939 until 1985, when the facility was destroyed by a fire. This property currently contains no structures and is vacant.

- The NSSD facility east of the Site was a landfill owned by Abbott Laboratories. The landfill materials were excavated and removed in 1972 during construction of the NSSD retention basins. The retention basins are used by NSSD for water treatment operations.

- Parcel 3, to the south, is owned and used by the City of Waukegan as a residential yard waste compost facility. Asphalt grindings have also been stockpiled on Parcel 3 in the past, and the current status of such stockpiling will be assessed during site activities, as PAHs are prevalent in asphalt.

- The property to the south of Parcel 3 has been occupied by the A.L. Hansen Manufacturing Company since 1950. The property was formerly used as a manufacturing plant and metal hardware production facility for heavy equipment and is currently used as a warehouse distribution center.

Based on their location relative to the Site and the eastward groundwater flow direction, impacts to Site soil or groundwater quality are likely to be minimal given the industrial land uses on the above properties. Chlorinated VOCs (CVOCs), which are not MGP related, were detected in groundwater (and soil below the water table) beneath Dahringer Road. If compounds not apparently MGP related are identified that exceed risk-based screening levels, the distribution and concentrations of these compounds will be further evaluated with respect to site-specific background and/or the potential impacts of off-Site sources. The area to the west of the site has been bounded by a road and railroad tracks since the MGP was developed. Between the railroad and nearby bluffs was a large, low-lying undeveloped area for much of the site history and there were no known structures or facilities. In the 1970s, this area was filled and the converted to interstate highway use. This area is situated upgradient of the Site and is not anticipated to impact soil or groundwater quality on the Site.

2.2.4.2 Database Searches

Database searches were completed to identify nearby historic or current facilities that have the potential to impact conditions on the subject property. These database searches identified the Site (North Shore Gas North Plant) on the Illinois EPA SRP Database and the EDR MGP Database. The Waukegan Tar Pit, located on the Site, was a tar disposal area used during MGP operations. The Waukegan Tar Pit appeared on the CERCLIS Database as well as the RCRA-NonGen and Illinois Category Lists. These databases and other facilities of interest occurring in the vicinity of the Site are discussed below.

Background information for this SSWP was also obtained from Environmental Data Research Inc. (EDR). The EDR Radius Map™ and Report and the Illinois Water Well Report are included in Appendices B1 and B2, respectively, on the enclosed CD. The EDR Radius Map report is a summary a state and federal databases searched to assist in the evaluation of environmental risk associated with a parcel of real estate. The following federal databases contain sites within 1 mile of the former North Plant MGP: NPL, CERCLIS, CORRACTS, RCRA-SQG, RCRA-NonGen, US Eng Controls, US Inst Controls, US Brownfields, Consent and ROD.

- The National Priority List (NPL) database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program and USEPA is the source of this database. Review of the NPL revealed Schuller International Inc. and Outboard Marine Corporation are the only sites within approximately 1 mile of the target property.

- The Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) contains data on potentially hazardous waste sites that have been reported to USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of CERCLA. CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL. Outboard Marine Corporation was the only CERCLIS site within approximately 0.5 miles of the target property.

- CORRACTS is a list of handlers with Resource Conservation and Recovery Act (RCRA) Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity. A review of CORRACTS indicated Outboard Marine Corporation is the only site within approximately 1 mile of the target property.

- RCRA-SQG is EPA's comprehensive information system, providing access to data supporting the RCRA of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the RCRA. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Review of the RCRA-SQG revealed BRP US Inc. and Hanson Al Mfg Co. are the only sites within approximately 0.25 miles of the target property.

- RCRA-NonGen is USEPA's comprehensive information system providing access to data supporting the 1976 RCRA and 1984 HSWA. The database includes selective information on sites that generate, transport, store, treat and/or dispose of hazardous waste as defined by RCRA. Non-Generators do not presently generate hazardous waste. Review of the RCRA-NonGen list revealed that Outboard Marine Corporation was the only site within approximately 0.25 miles of the target property.

- US Eng Controls is a listing of sites with engineering controls in place. Review of the US Eng Controls list revealed Outboard Marine Corporation there is only site within approximately 0.5 miles of the target property.

- US Inst Control is a listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use, construction, or property use restrictions as well as post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of institutional controls. Review of the US Inst Control list revealed Outboard Marine Corporation is the only site within approximately 0.5 miles of the target property.

- US Brownfields is the USEPA's listing of Brownfields properties addressed by Cooperative Agreement Recipients and Brownfields properties addressed by Targeted Brownfields Assessments. Review of the US Brownfields list revealed Waukegan Gas Station, Kyritsis II, Kyritsis I, Martinovich, and Jensen are the five sites within approximately 0.5 miles of the target property.

- Consent is a listing of major legal settlements that establish responsibility and standards for cleanup at NPL sites released periodically by US District Courts after settlement by parties to litigation matters. Outboard Marine Corporation is the only Consent site within approximately 1 mile of the target property.

- Record of Decision (ROD) documents the mandate for a permanent remedy at an NPL site containing technical and health information to aid the cleanup. Schuller International Inc. and Outboard Marine Corporation are the only two ROD sites within approximately 1 mile of the target property.

- The following state databases contained sites within 1 mile of the former North Plant MGP: SHWS, CAT, SWF/LF, IL NIPC, LUST, UST, Inst Control, SRP, IMPDMENT and Brownfields.

- The State Hazardous Waste Sites (SHWS) records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Illinois EPAs Category List. Review of the SHWS list revealed TK Disposal Inc., Diamond Scrap Yard, Waukegan Municipal Landfill 1 and Waukegan Coke Plant are the four SHWS sites within approximately 1 mile of the target property.

- Illinois Category List (CAT) indicated Schuller International Inc., Outboard Marine Corporation, and AKZO Nobel Aerospace Coatings are the three CAT sites within approximately 1 mile of the target property.

- The Solid Waste Facilities/Landfill Sites (SWF/LF) records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The Illinois EPAs list of Solid Waste Landfills Subject to State Surcharge indicates the Waukegan Landscape Waste Compost Facility is the only SWF/LF site within approximately 0.5 miles of the target property.

- Illinois Northern Illinois Planning Commission (IL NIPC) is an inventory of active and inactive solid waste disposal sites, based on state, local government and historical archive data. Included are numerous sites not previously identified because there was no obligation to register such sites prior to 1971. The IL NIPC list indicates Griess-Pfleger and GM Coke Plant are the only two IL NIPC sites within approximately 0.5 miles of the target property.

- The Leaking Underground Storage Tank (LUST) Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Illinois EPAs LUST Incident Report. The LUST list indicated there are seven LUST sites within approximately 0.5 miles of the target property; Outboard Marine Corporation, ComEd (General Boiler), North Shore Sanitary Dist., City of Waukegan (2), Waukegan Illinois Hosp Co LLC and Larsen Marine Service.

- The Underground Storage Tank (UST) database contains registered USTs. The data come from the Illinois Office of State Fire Marshal (OSFM) STC Facility List. The UST list revealed there are five UST sites within approximately 0.25 miles of the target property; General Boiler Property, Lincoln Center, Waukegan Waste Water Treatment, A.L. Hansen Manufacturing and Outboard Marine Corp.

- Inst Control is legal or administrative restrictions on land use and/or other activities (e.g., groundwater use restrictions) which effectively limit exposure to contamination may be employed as alternatives to removal or treatment of contamination. A review of the Inst Control list revealed that there is one Inst Control site within approximately 0.5 miles of the target property; General Boiler.

- Illinois EPA SRP Database. A review of the SRP list revealed that there are three SRP sites within approximately 0.5 miles of the target property; General Boiler, Outboard Marine Corporation and Griess-Pfleger.

- IMPDMENT is a statewide inventory of industrial, municipal, mining, oil and gas, and large agricultural impoundment. This study was conducted by the Illinois EPA to assess potential for contamination of shallow aquifers. This was a one-time study. Although many of the impoundments may no longer be present, the sites may be contaminated. A review of the IMPDMENT list revealed that there are two IMPDMENT sites within approximately 0.5 miles of the target property; Union Metal Corp and NSSD.

- The Illinois Municipal Brownfields Redevelopment Grant Program (MBRGP) offers grants to municipalities to assist in site investigation activities, development of cleanup, objectives and performance of cleanup activities. Brownfields are abandoned or underused industrial and/or commercial properties that are contaminated (or thought to be contaminated) and have an active potential for redevelopment. A review of the BROWNFIELDS list revealed that there are two BROWNFIELDS sites within approximately 0.5 miles of the target property; Waukegan Gas Station and Kyritsis North Property.

- The EDR MGP Database includes records of coal gas plants, and indicates there are four additional MGP sites within approximately 1 mile of the target property; North Shore Gas Spring Street, North Shore Gas Coke Plant, General Boiler, and North Shore Gas South Plant.

- The Illinois Water Well Report (Appendix B2, enclosed CD) was reviewed to confirm that no drinking water wells were located within one mile of the Site.

Previous North Plant and Waukegan Tar Pit investigations indicate groundwater flow is east toward Lake Michigan and thick sand layers underlie the site. None of the referenced sites is directly up gradient of the former MGP; rather; they are either side or down gradient of the former MGP site, so it is unlikely locations much further than 0.25 mile from the site would influence it significantly. Also, the lack of development west of the former MGP site suggests there may be few off-site impacts of concern. Even the former Abbott landfill, which was located to the east and previously excavated as part of the NSSD improvements, is unlikely to significantly impact the site, although there is the potential for groundwater plumes to be influenced by down gradient sources. This will be discussed in more detail below.

2.2.4.3 Other Sources Consulted

According to a report entitled *Preliminary Site Investigation, North Plant Site, Waukegan, Illinois,* prepared by Barr Engineering Co. (Barr), dated January 1993 (Barr 1993), the original parcel of land located at the southeast corner of Dahringer Road and Pershing Road (formerly Sand Street) was purchased by North Shore Gas in 1912 from Everett and Elizabeth Millard. According to a report entitled *Final Report and Supplemental Extent of Contamination Study, Docket No. V-W-'91-C-115 Waukegan Tar Pit Site (WTPS)*, prepared by Barr, dated February 1994 (included in Appendix C, enclosed CD), by the end of 1912, the former North Plant MGP was constructed and operational. In 1925, North Shore Gas sold a triangular parcel of land along the eastern property line to EJ&E Railroad, who in turn sold two parcels of land, one triangular parcel in the northeast corner of the property and one parcel near the southern property line, to North Shore Gas. North Shore Gas sold all of its property (inclusive of Parcels 1 and 3) to the City of Waukegan in 1975, who subsequently sold the northern two-thirds of its property (Parcels 1) to the NSSD in 1982. The NSSD also purchased a parcel of land located directly east of the former North Shore Gas property (Parcel 2) from EJ&E Railroad in 1982 (Barr 1994). In 2002, North Shore Gas re-purchased the portion of the former North Plant and the adjacent property that was owned by the NSSD (Parcels 1 and 2). The southern parcel (Parcel 3) of the former North Plant MGP is owned by the City of Waukegan. EJ&E has owned Parcel 4 since 1925.

The former North Plant MGP operations primarily occurred in the northern, central and western portions of Parcel 1. The MGP produced gas using a CC process from 1912 to 1927, when the plant was converted into a CWG facility. In 1951, the CWG equipment was converted to manufactured OG. Manufactured gas production using the OG process ceased by 1953. The former MGP also had propane air equipment on-site from 1940 through 1965 to meet peak energy demands. By 1965, operations ceased, and the former North Plant MGP was dismantled in stages between 1966 and 1968.

Many MGP facilities produced the power needed to drive ancillary equipment. In addition, most plants used steam. This was particularly true for CWG plants, where steam was a primary feed-stock for the gas making. During periods when CWG was produced at the MGP, there would most likely been wastewater generated and discharged from the plant. The wastewater would have been discharged from a "tar-water-separator" or a similar settling apparatus. Although no water discharge criteria existed during the period of plant operation, there is historical documentation that plant operators paid particular attention to these discharge streams and many used a coke filtering mechanism to ensure that discharge water was clean. Discharge that included excess levels of MGP residuals would have resulted from accidental spillage.

During plant demolition in the late 1960's, a relief holder ruptured and a mixture of water, tar, and tar emulsion were released to the soil. As a result, 25,000 tons of impacted soil was excavated from a ditch on the Site in 1968, and this ditch location is shown on Figures 4 and 6. Also, in 1992, the Waukegan Tar Pit was the subject of a removal action conducted pursuant to a Removal Order issued to North Shore Gas by USEPA. Visual tar was excavated and a high density polyethylene (HDPE) liner was installed overt the excavated pit. Since that time, water has collected on top of the HDPE liner (less than a few feet deep) and sediment is present on the liner as well.

A review of historical information from the City of Waukegan and NSSD indicates that if wastewater was generated from plant operations, it most likely would have been discharged onto Parcel 2 to the east. Historic sewer maps obtained from the NSSD (Appendix A4, enclosed CD) were reviewed and Figure 5 presents existing utilities in the area.

As with many operations, MGP operations generated various by-products and waste. Wastewater generation and management are described above. Tar was reclaimed and sold for profit. The Former North Plant MGP was surrounded by a variety of industries that also had wastewater discharges.

2.3 Previous Investigation Summary

Several SI actions have occurred on the North Plant Site since 1990. Some of the SI activities were conducted in accordance with the Illinois EPA SRP, as defined in Chapter 35 of the Illinois Administrative Code (IAC), Part 740 (35 IAC, Part 740). Soil and groundwater samples were collected and analyzed for a variety of constituents. In many cases the results were compared to Tiered Approach to Corrective Action Objectives (TACO) Tier 1 Remediation Objectives (ROs) contained in 35 IAC, Part 742. Furthermore, a contaminant source evaluation was conducted pursuant to TACO, 35 IAC Part 742.305, based on the results of soil samples submitted for chemical analyses. Test pits were also excavated and samples were collected and analyzed in some cases. Groundwater monitoring wells were also installed and sampled. Each individual report provides detailed information on specific activities; however a brief summary is presented below. The following is a summary of the SI activities:

2.3.1 Weston, 1990

Site Assessment for Waukegan Tar Pit; Weston, 1990

Report completed for USEPA following reconnaissance of the Waukegan Tar Pit by the USEPA Technical Assistance Team (TAT). The TAT observed unrestricted access to a pit of free tar, the surface of which was covered with water.

The presence of the surface water made the pit look like a natural pond, so birds and other animals became trapped by the tar if they came to feed in this area. Free tar and oil was also reported to be observed on the ground surrounding the tar pit.

The pit measured approximately 125 feet (north-south) by 60 feet (east-west). One water and two tar samples were analyzed, and the laboratory results indicated volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were present in the water and tar. The flash point for one of the tar samples was below acceptable levels, resulting in conditions that warranted an emergency removal action due to 1) actual or potential exposure to hazardous substances and 2) the threat of fire or explosion.

2.3.2 Illinois EPA, 1992

CERCLA Preliminary Assessment Report; Waukegan Tar Pit; Illinois EPA, 1992

A Preliminary Site Inspection was conducted from September through November 1990. Based on the inspection, USEPA recommended that the Waukegan Tar Pit be placed on the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list and be assigned a high priority status. During the PA/SI, evidence of the historical gypsum dumping alongside of the EJ&E tracks was noted in addition to other impacts. Other site observations included the following:

- No discernable surface water drainage patterns were evident, although any water that might flow along the surface would need to flow south along the EJ&E rail lines;
- Lake Michigan is approximately 3,000 feet east of the Waukegan Tar Pit;
- EJ&E railroad personnel indicated gypsum was cleaned from rail cars in the area immediately south of the pit;
- Surface water and soil contamination were confirmed, and because the pit extended below the surface it was speculated that groundwater was also contaminated in the immediate vicinity;
- The site is in unconsolidated glacial and fluvial deposits. Illinois State Geological Survey reports indicated the underlying Silurian dolomite is approximately 100 feet below ground surface (bgs) in this area, and Barr (1994) noted that bedrock was encountered at depths of 97 to 113 feet in wells located within one-half mile of the site; and
- The City of Waukegan obtains drinking water from Lake Michigan.

2.3.3 Barr, 1991

Extent of Contamination Study; Waukegan Tar Pit Site; Barr Engineering Company (Barr); May 1991

Barr conducted an Extent of Contamination (EOC) Study from February to March 1991 to laterally and vertically delineate the limits of the tar pit and to identify removal methods in response to the USEPA Preliminary Assessment.

Sixteen hand auger borings and 10 hand probes were advanced within the Waukegan Tar Pit limits to characterize soil and assess the depth of tar within the tar pit. Tar samples were collected from three locations in the tar pit and were composited together into one sample. The tar sample was analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs).

Twenty borings were advanced to further delineate the limits of the tar pit. Two composite soil samples were collected, one north and one south of the tar pit. The samples were analyzed for VOCs, SVOCs and metals. Additional testing included flashpoint, specific gravity and British Thermal Unit (BTU) content. Select samples were also analyzed for toxicity characteristic leaching procedure (TCLP) metals.

Based on the analytical results, “elevated” levels of VOCs, SVOCs and metals were present. Most of the free tar was present in the tar pit. Tar was found in many of the other borings, but was present as a mixture of tar and sand. Most of the tar/sand mixture was found within the upper 10 feet of the soil; however, there were a few locations where the tar/sand mixture was below 10 feet. A subsequent removal action was implemented and is discussed below and in Section 2.4. A copy of this Barr report is included in Appendix C1 (enclosed CD).

2.3.4 Barr, 1993

Preliminary Site Investigation; North Plant Site; North Shore Gas Company, Waukegan, Illinois; Barr, January 1993

Following the Waukegan Tar Pit removal action, Barr conducted a preliminary SI to determine if there was a potential for environmental impact at the Former North Plant MGP. The preliminary SI concluded that chemical constituents associated with past MGP operations may be present in surface soils. No sampling was conducted as part of this event.

2.3.5 Barr, 1994

Final Report and Supplemental Extent of Contamination Study, Docket No. V-W-'91-C-115, Waukegan Tar Pit Sit; North Shore Gas Company, Barr, January 1994

In August 1992, Barr conducted a Supplemental Extent of Contamination (SEOC) Study at the Waukegan Tar Pit under Administrative Order, Docket Number V-W-'91-C-115, pursuant to Section 106 of CERCLA (Section 106 Order) for the Waukegan Tar Pit. The Waukegan Tar Pit was excavated on January 10, 1992 and covered with an high-density polyethylene (HDPE) cover. The removal action was conducted to "remove all visible free tar" (tar that is not mixed with any soil or other foreign material) from the tar pit and important observations include the following:

- Removal activities included dewatering, tar excavation, solidification, transportation, and disposal, and installation of the HDPE cover and compacted clay berm;
- The depth of free tar within the pit ranged from 1 to 3.5 feet thick;
- Approximately 2,825 tons of solidified tar and miscellaneous material were disposed at the Adams Center Landfill in Fort Wayne, Indiana; and
- Approximately 1.27 million gallons of water were pumped from the tar pit and discharged to the sanitary sewer for treatment.

In addition to documenting the removal action specified in the Section 106 Order, 66 soil borings were advanced; five groundwater monitoring wells were installed; 54 soil samples were collected and analyzed for VOCs and polynuclear aromatic hydrocarbons (PAHs); and several rounds of groundwater samples were collected and analyzed for VOCs, PAHs and inorganics as part of the SEOC Study. Free tar was identified in the northeast portion of the Site (Parcels 1 and 2) based on visual observation and on the property immediately east. Four groundwater monitoring wells were installed on the Site and two wells were installed east of the Site. The SEOC Study report (Appendix C2, enclosed CD) was submitted to USEPA in February of 1994. Other pertinent observations from the SEOC study include the following:

- The only surface water observed at the site was limited to that which collected on the former tar pit.
- An estimated 67,000 cubic yards of soil (extending to a depth of 26 feet) that contain tar remain in the vicinity of the tar pit. Of this soil volume, approximately 46,000 cubic yards and 55,000 cubic yards are present to depths of 10 and 12 feet bgs, respectively.
- Chlorinated compounds (including trichloroethene [TCE], 1,1,1-trichloroethane [TCA], 1,2-dichloroethene [DCE], 1,1-dichloroethane [DCA], and vinyl chloride) were detected in soil samples along Dahringer Road (borings B47, B47A, and B48A) All these soil samples were collected between 8 and 16 feet bgs, which is below the water table. Chlorinated compounds

were not detected in samples from the tar pit so Barr concluded their presence was unrelated to tar migration. Further, because they could be groundwater impacts, it is likely they originate from and off-site source.

2.3.6 Dames & Moore, 1995

Site Investigation Report of the Waukegan Tar Pit and the North Shore Gas Company; Dames & Moore, September 1995

Dames & Moore conducted a SI of the Site including Parcels 1 and 2 in September 1995. Dames & Moore was retained by the EJ&E Railway. The Dames & Moore SI included a geophysical survey to locate former MGP structures and the advancement of 16 soil borings to collect soil samples for visual characterization, lithology, and chemical analyses. Fifteen (15) soil samples were collected and analyzed VOCs and SVOCs as part of the SI. Tar was identified based on visual characterization and laboratory analyses in the northeast portion of the Site, the northwest portion of the Site, and the central portion of the Site. Pertinent observations from the investigation included the following:

- The geophysical survey suggested there were anomalies that appeared to start on the MGP site and terminate at or near the Waukegan Tar Pit.
- Tar samples from a 5'x 5' pit on the northwest corner of the Site were compared to tar from the Waukegan Tar Pit area to assess constituents and concentrations.
- Four of 14 soil samples were collected from four to six feet bgs. The other 10 samples were collected deeper, which suggests they were collected below the water table.
- Samples indicated a dense non-aqueous phase liquid (DNAPL) was present in borings centrally located on the site, which correlates to the location of wells MW-9S/MW-9D, where more recent investigations noted tar to be present in the wells.

2.3.7 Burns & McDonnell, 2005

Comprehensive Site Investigation, Former North Plant Manufactured Gas Plant Operational Area and Adjacent Property, Waukegan, Illinois; North Shore Gas Company; Burns & McDonnell, November 2005, (CSI Report, Burns & McDonnell 2005)

Burns & McDonnell conducted a source delineation SI in July and August 2002 and a comprehensive SI on Parcels 1 and 2 from July through September 2004. The objectives of the SI were to delineate the extent of previously identified releases of tar and other contaminants and determine if there is a threat to human health and the environment.

Sixty-one soil borings and 16 test pits were advanced during the August 2002 SI. Twenty-seven soil borings, 54 soil probes and 23 test pits were advanced during SI field activities in 2004. Fourteen of the

soil borings were converted into groundwater monitoring well nests screened at varying depth intervals within the same unconfined water bearing unit. Soil samples were analyzed for target compound list (TCL) VOCs, TCL SVOCs, priority pollutant metals and total cyanide. Select samples were additionally analyzed for waste characterization purposes via TCLP RCRA metals, synthetic precipitate leaching procedure (SPLP) metals, PCBs, reactive cyanide, reactive sulfide, flashpoint, total petroleum hydrocarbons (TPH), and soil pH.

Groundwater samples were collected once from each of the 30 groundwater monitoring well. Samples were analyzed for TCL VOCs, TCL SVOCs, priority pollutant metals, and amenable cyanide.

Soil impacts were observed to varying degrees during the field activities. Contaminant source (MGP source material in the form of tar, tarry residue, or related sheen) were identified based on visual observation and analytical results (Figure 6). Several constituents were identified in soil and groundwater samples. Tar was identified on the surface in portions of the Site and in one groundwater monitoring well nest. Typical MGP constituents were identified. CVOCs, which are not associated with former MGP operations, were identified in the northeast portion of the Site and are believed to be associated with former industrial operations located north of the Site.

The general distribution of impacts, especially related to the presence of tar in surface and subsurface soils is shown on Figure 6. Locations where benzene, naphthalene, and ethylbenzene exceed the Illinois Residential screening levels are shown on Figure 7. The locations have been identified for three depth intervals; 0 to 3 feet bgs, 3 to 10 feet bgs, and deeper than 10 feet bgs. Five areas of concern that may require remediation were identified and include the following:

- The northeast portion of the Site near the Waukegan Tar Pit Site;
- The eastern and southeastern portions of the Site along the EJ&E railroad tracks;
- The northwest portion of the Site including the area of the former aboveground gas holder, tar wells, and generator house;
- The center of the Site, near the former purifying room, purifier house, aboveground tar tank, and coke bins; and
- The southwest portion of the Site north of a former tar pit structure (first noted by Barr in the Preliminary Site Investigation).

In addition to these results, the investigation concluded the following:

- No immediate response activities were warranted based on the results and observations; and
- No further investigation was needed on-site to formulate the remediation objectives in accordance with the SRP.

2.4 Previous Actions

Previous actions undertaken at the Site include the following:

- Activities associated with plant decommissioning in 1968. During plant decommissioning, a relief holder ruptured and released a mixture of water, tar emulsion and tar to the soil. Soil in the affected ditch was excavated from an area of approximately 300 feet by 10 feet, and an estimated 25,000 tons of tar was excavated. The ditch is shown on Figures 4 and 6. No other details regarding this rupture and excavation are available.
- Free tar removal from the Waukegan Tar Pit in 1991 pursuant to a CERCLA Removal Action Order. The objective of the removal action was to remove all visible tar from the Waukegan Tar Pit. Six inches of water covered the pit's surface. The water was removed, treated and discharged into a NSSD sanitary sewer. Excavation began on November 26, 1991. The depth of tar that was removed ranged approximately 3 to 6 feet below ground surface (bgs). A HDPE liner was installed after the boring advancement. Approximately 1,288,000 gallons of water was treated and 1,269,000 gallons for water was discharged into the NSSD sanitary sewer. The remaining 19,000 gallons of water was placed on top of the HDPE liner to hold it in place. A copy of the Free-Tar Removal Action Report is included in Appendix C3 (enclosed CD).
- Limited excavation activities occurred in the central portion of the Site in early 2003 in one of the five areas identified in 2002. Excavation was suspended because of potential litigation issues with other potentially responsible parties (PRPs). Excavation activities were conducted in the central portion of Parcel 1 in an area where several aboveground oil tanks were formerly located (Figure 7). Approximately 1,700 tons of excavated material was managed as non hazardous special waste. The excavation extended to the water table and the area was subsequently backfilled with imported, clean granular material.

3 SUMMARY OF CURRENT SITE CHARACTERISTICS

3.1 Site Topography and Drainage

Site According to the United States Geological Survey (USGS) 7.5-Minute Waukegan Quadrangle (1993), the Site is at an elevation of approximately 590 feet above mean sea level and is mostly flat. Regional surface waters generally flow southeasterly towards Lake Michigan, which is located approximately 3,200 feet east of the Site. Lake Michigan water levels can also change by several feet over a matter of hours, due to weather effects. Such transitory lake water level changes would not significantly influence groundwater levels measured on-site. Lake levels are generally highest in summer and lowest in winter (USEPA, 1995). Lake water level influences would be mediated by the groundwater between the site and the lake, as lake levels are generally 5 or more feet lower than site groundwater levels.

A portion of the Waukegan Tar Pit (in Parcel 2) and defined wetlands (in Parcels 1 and 2) are located on the Site. A Wetlands Delineation Report was prepared October 2003 (Burns & McDonnell, 2003). A Wetland Boundary Verification submittal was prepared by Burns & McDonnell in July 2004 to supplement the Wetlands Delineation Report. Four wetlands were identified at the Site. Three high quality wetlands were located on the eastern portion of the Site and one low quality wetland was located along the western Site boundary. According to the National Wetland Inventory map developed by the US Fish and Wildlife Service, a Palustrine Open Water/Unknown Bottom Semipermanently Flooded (POWF) wetland area is located on the northeast portion of the Site. Burns & McDonnell conducted further wetland delineation on the Site at the direction of the Lake County Stormwater Management Commission. Three wetland areas were delineated by Burns & McDonnell and were approved by a Wetland Specialist from the Lake County Stormwater Management Commission through correspondence addressed to Burns & McDonnell, dated August 16, 2004.

The closest surface water body to the Site is the North Ditch that lies approximately 800 feet to the east-southeast. Surface water bodies within close proximity to the Site include Waukegan Harbor, which lies approximately 2,000 feet southeast of the Site and Lake Michigan that lies approximately 3,000 feet east of the Site. Natural surface water runoff is primarily influenced by local and Site topography. There are no storm sewer inlets located on-site. The ground surface at the Site consists mainly of grass and gravel areas. A March 1935 NSSD drawing (Intercepting Sewer Plan & Profile – Sta.17+00 to 34+00) indicates two former sewer lines were located on the southern portion of the site (Appendix A4, enclosed CD).

A 48-inch line appears to end on the facility (just west of the main railroad lines) approximately 550 feet southeast of the former above ground gas holder. Review of the 1939 and 1946 aerial photographs and NSSD drawing, this line may have run beneath a former road (possibly vacated) or some other linear structure apparent on these photos (Appendix A3, enclosed CD). Based on the aerial photographs, it appears this line ran through the area where the current NSSD ponds are now located. A 36-inch line was located approximately 900 feet south of the gas holder and even further south of where the site railroad spur rejoined the main railroad tracks, which suggests this line was too far south to have been used as part of site operations.

City of Waukegan granted the NSSD a 33-foot wide easement along the southern property boundary of the Site for a 54-inch relief sewer and a 20-foot wide easement along the northern property boundary of the Site for a 54-inch sanitary sewer. There are no buildings or paved areas on the Site.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM), NWI and the Illinois Department of Conservation's Natural Heritage Database (IDC NHD) records were searched for the EDR report. According to the FEMA FIRM, the Site is not within the limits of the 100-year floodplain. The IDC NHD lists no federal or state threatened and endangered species or pristine natural areas located within the Site boundaries. A number of Illinois endangered species are listed in an area northeast of the Site and copies of these maps are included in Appendix B3 (enclosed CD).

3.2 Geology and Hydrogeology

The information provided below is based on literature research and previous investigations. This summary is an overview and will be modified, updated and refined based on forthcoming RI activities.

3.2.1 Regional Setting

Several published documents were reviewed to understand the regional geological setting in the area of the Site. *The Geologic Map of Illinois* (Willman 1967) indicates that bedrock beneath the Site is Silurian Dolomite. Based on this map, the approximate depth bgs to the bedrock surface is generally greater than 50 feet and bedrock is overlain by glacial deposits. *The Quaternary Deposits of Illinois* (Lineback 1979) map indicates that the surface soil at the Site is man-made land that was formerly covered by Lake Michigan, and is surrounded by the Dolton Member of the Equality Formation. The Dolton Member is described as largely shallow water, near shore lake sediments comprised predominately of medium-grained sand and some gravel (Willman 1975).

The publication entitled *Stack Unit Mapping of Geologic Materials in Illinois to a Depth of 15 Meters* (Berg and Kempton 1988) indicates that Site soils consist of man-made land greater than 20 feet thick. *Plate 1: Land Burial of Municipal Wastes* and *Plate 2: Surface and Near-Surface Waste Disposal* contained in the publication entitled *Potential for Contamination of Shallow Aquifers in Illinois* (Berg and Kempton 1984) rate the aquifer susceptibility for the Site as A2. For land burial of municipal wastes and surface and near-surface waste disposal, a rating of A2 indicates thick, permeable sand and gravel within 20 feet of the land surface. This aquifer rating suggests that near surface waste disposal and land burial of municipal waste exhibits a high likelihood of impacting shallow aquifers beneath the Site.

The *Summary of the Geology of the Chicago Area* (Willman 1971) describes shallow groundwater in the Chicago area, including Waukegan, as being limited to sand and gravel horizons in unconsolidated soil and fractured bedrock aquifers. The unconsolidated materials in this area consist primarily of clay with isolated lenses of sand material and are not considered aquifers. In the Chicago area, bedrock aquifers are found within Silurian, Ordovician and Cambrian formations, which are greater than 50 feet bgs. Precipitation and surface seepage recharges shallow groundwater aquifers in the Chicago area, including Waukegan. The Berg and Kempton publication (Berg and Kempton 1984) provides estimated hydraulic conductivities of typical geological materials in Illinois. Geological materials encountered at the Site include sand and gravel fill, sand, and silty clay. Estimated hydraulic conductivities for these soil types are as follows:

Sand and gravel	1×10^{-3} cm/sec
Sand	1×10^{-5} to 1×10^{-3} cm/sec
Silty Clay	1×10^{-9} to 1×10^{-7} cm/sec

The City of Waukegan obtains its municipal water supplies from Lake Michigan. Additionally, the Lake County Board of Health Ordinance Article XV regulates and limits the use of water wells within the county. Water wells are not permitted by Lake County in areas where a public water supply is available. Potable water wells may be permitted where a public water supply is not available with the approval of the Lake County Health Department (Lake County 2007). No municipal or private drinking water wells are located on the Site or within a one mile radius of the Site, as discussed in Section 2 of this SSWP.

3.2.2 Local Summary

During SI activities conducted by Burns & McDonnell, 81 soil probes/borings and 23 test pits were advanced at the Site. During the August 2002 investigation activities, 61 soil borings and 16 test pits were advanced at the Site. Surface and subsurface soil samples were collected and submitted for chemical analyses.

Site geology was characterized during advancement of soil probes/borings and test pits, and recorded on drilling logs or test pit logs. The boring and test pit logs are contained in the CSI Report (Burns & McDonnell 2005). The unconsolidated materials identified at the Site consist of silty clay overlain by sand and fill material. Bedrock was not encountered during the 2004 or August 2002 investigations. Geotechnical testing was conducted and soil classifications were made. The following paragraphs describe the unconsolidated material encountered.

Five geological cross-sections showing subsurface soil encountered at the Site were prepared from soil probe/boring logs: two cross-sections trending north to south across the length of the Site (A-A' and B-B') and three cross-sections trending west to east across the width of the Site (C-C', D-D', and E-E'). Figure 8 presents the locations of the geologic cross-sections and Figures 9 and 10 present the geological cross-sections. A contour map showing the surface of the underlying clay is shown on Figure 11

Fill Unit – The fill unit consists primarily of sand with smaller amounts of gravel, cinders, brick fragments and wood fragments. Material believed to be gypsum was encountered within the fill unit in several soil borings advanced on the eastern portion of the Site. As discussed previously in Section 2.2.4.1, visual evidence of gypsum dumping alongside of the EJ&E tracks was identified at the ground surface. Based on the proximity of the gypsum to the railroad and the presence of National Gypsum Company, which stockpiles and distributes gypsum, approximately 1 mile to the southeast, the gypsum identified at the Site is likely processed gypsum. A sample of the suspected gypsum was collected and submitted to a laboratory testing and the results confirmed that the material is gypsum based on USEPA Method 600/R-93/116 Section 2.5.5.1. The fill unit generally ranged from 3.5 feet to 11 feet thick, with an average thickness of approximately 7 feet.

Sand Unit - Underlying the fill unit is the sand unit that consists primarily of olive gray to light olive gray native medium to fine-grained sand. The top of the sand unit was generally encountered at depths ranging from 3.5 to 11 feet bgs, with an average thickness of 17 feet. In two soil borings/probes, SB36 and SP157, the top of the sand unit was encountered at depths of 12 feet and approximately 15 feet bgs, respectively.

Silty Clay Unit – Underlying the sand unit is the silty clay unit that consists of olive gray to light olive gray, hard to very hard, low plasticity, moist silty clay. This unit serves as a low permeability barrier directly beneath the sand layer. The clay unit was encountered in all soil borings and probes advanced across the Site, except where shallow refusal was encountered. The top of the clay unit was encountered at depths ranging from 18.5 to 29 feet bgs and was observed to the terminus of the soil borings, the deepest being 32 feet bgs.

The Illinois State Geological Survey (ISGS) indicates the Wadsworth Till, which this unit is a part of, ranges from 30 to 40 feet thick in the vicinity of Lake Michigan (*Geology for Planning in Lake County, Illinois* - Circular 481, ISGS, 1973).

Groundwater was encountered in all boring and probe locations in 2004. The soil boring, probe, and test pits locations on the Site and east thereof are shown on Figure 6. Well nests consisted of a water table monitoring well and piezometer screened in the same unconfined sand aquifer. The wells nests, along with the two Barr wells on Parcels 1 and 2 were sampled in August 2004; the three Barr wells on NSSD property were sampled in October 2004 (Figure 12). The August and October 2004 elevation contours show groundwater generally flows east (Figures 13 and 14, respectively). DNAPL was present in wells MW9S/MW9D and wells MW5S/MW5D are located near a sanitary sewer; these factors were believed to influence the groundwater elevations so these data were not used to develop the contour maps.

The sand unit functions as the main water-bearing unit at the Site and groundwater is encountered at about 7 feet bgs. Recharge of groundwater in the fill, sand, and silty clay units are expected to occur locally and are presumed to be affected by infiltration of incidental precipitation. The porous nature of the upper fill and sand units allow for adequate percolation into the subsurface. Slug tests performed during past investigations indicate the hydraulic conductivity of the silty sand unit is approximately 5.66 x 10-3 centimeters per second (cm/sec).

Retention basins and two dewatering wells are located on the NSSD property. The typical use of dewatering wells associated with retention basins is to prevent excessive water pressure on the exterior walls of the basins. The retention basins and dewatering wells may have an impact on groundwater levels at the Site. Information provided by the NSSD indicates the following pertaining to these wells:

- The wells are only used to check the groundwater level before a tank is emptied for cleaning or servicing.
- Only well MW-2 is used for dewatering. A submersible pump is placed in the well and the purge water is pumped into one of the primary tanks.
- Water level and pumping data are not recorded.
- There is no analytical data on the wells.

If groundwater impacts appear to extend to these wells, IBS will pursue additional information from the NSSD (as suggested by USEPA).

3.3 Climate

The climate in the vicinity of Waukegan and the Chicago area is typically continental with some modification by Lake Michigan. The moderating effect of Lake Michigan is well illustrated by the fact that the growing season of 170 to 175 days along the Lake Michigan coastal area is of the same duration as in Central Illinois. The average date of last spring freeze is late April and the first autumn freezes occur in mid-October along the Lake Michigan coastline. Most of the streams and lakes in the area are ice-covered from late December to late February. Flooding is most frequent and serious during April.[2]

Historic temperature and precipitation data for Chicago is summarized on Table A below[3]. Average monthly temperatures range from about 20ºF (January) to about 72ºF (July). The high and low monthly averages range by approximately ±10ºF from the monthly mean. Almost 60 percent of the annual rainfall occurs between May and October while almost 90 percent of the snowfall occurs between December and March. Overall, the mean average temperature for the area is approximately 49ºF and over 35 total inches of precipitation (both rainfall and snow accumulation) is received.

Table A: Historic Chicago Temperature and Precipitation Data

	Monthly Temperatures (°F)			Monthly Averages (in.)	
Month	High	Low	Mean	Precipitation	Snowfall
January	28.5	12.0	20.3	1.60	11.5
February	32.9	16.6	24.8	1.40	9.5
March	43.0	26.0	34.5	2.15	5.3
April	54.6	35.6	45.1	3.73	1.4
May	66.7	45.8	56.3	3.44	0.0
June	77.1	55.3	66.2	3.62	0.0
July	81.7	61.3	71.5	3.49	0.0
August	80.1	60.5	70.3	4.22	0.0
September	73.1	52.4	62.8	3.40	0.0
October	61.6	40.9	51.3	2.42	0.1
November	47.3	29.9	38.6	2.57	1.9
December	33.9	18.3	26.1	2.05	8.2
Annual Precipitation Totals				34.09	37.9

[2] Illinois State Climatology Office website, October 2008, http://www.sws.uiuc.edu/atmos/statecli/
[3] Climate Zone Midwest Region, website, http://www.climate-zone/climate/untide-states/illinois/chicago

3.4 Population and Land Use

The City of Waukegan population is approximately 89,000 people[4]. The Site is zoned general industrial (I2) and the surrounding area is a mix of industrial, residential, and conservation/recreation (CR) property (Figure 3). The Site is currently vacant and unpaved. A chain-link fence surrounds the Site and a portion of the adjacent property to the east. The City of Waukegan Lakefront Master Use Plan[5], which may be implemented in the future, calls for the areas of the Site to be used as moorland. The area around the Site is proposed to be used as open space and recreational areas. Utilities located in the vicinity of the Site are shown on Figure 5. The City of Waukegan receives municipal water from an intake located 1.5-miles southeast of the Site in Lake Michigan.

3.5 Cultural and Natural Resource Features

An EcoCAT search (Appendix A5, enclosed CD) of the Illinois Department of Natural Resources (IDNR) Natural Heritage Database lists Lyons Woods Illinois Natural Areas Inventory (INAI) and Waukegan Beach INAI Sites and the black-crowned night heron, common tern, and peregrine falcon as state threatened and endangered species or pristine natural areas occurring near the property. The Illinois Historic Preservation Agency (IHPA) determined there were no historic concerns related to the property.

3.6 Previous Investigation Findings & Current Site Status

This section summarizes the current Site status including the extent and magnitude of MGP residuals believed to be present.

3.6.1 Soil Quality

Based on previous investigations, and the interim and removal actions conducted at the Site, areas of concern related to soil quality remain on Parcels 1, 2 and 4. Figure 6 shows the boring, probe and test pit locations where tar was detected, regardless of its overall physical state and ability to flow or migrate readily, and these locations are circled in red. Figure 7 shows the distribution of benzene, naphthalene, and ethylbenzene that exceed soil screening levels. The area where naphthalene exceeds the screening levels is greatest in the 3 to 10 foot depth interval and indicates the presence of MGP residuals in the upper portion of the water table.

[4] 2010 U.S. Census Bureau data
[5] http://www.waukeganvision.com/plans_news/master_plan.html

The distribution of benzene and ethylbenzene is also greatest in the 3 to 10 foot interval and is generally consistent with naphthalene distribution. However, naphthalene is more widely distributed below 10 feet than either benzene or ethylbenzene (Figure 7). MGP residuals, including NAPL, were identified in many locations around the Site; however, liquid residuals that have the potential to migrate were noted below the water table rather than above. It appears tar on the ground surface or in the shallow subsurface soils was desiccated and has little potential to flow; it is also likely volatilization is minimal based on the desiccated state of the MGP residuals at the surface. There is no visual evidence of NAPL impacted soil beyond Parcels 1, 2 and 4 on surrounding properties, although the presence of tar in monitoring wells MW-9S and MW-9D suggest that potential may exist in the east-central portion of the site.

A summary of the VOCs, PAHs, SVOCs, and inorganic compounds detected in Site soils is summarized on Table 1. Specific analytical results from the 2002 and 2004 investigations for VOCs, PAHs, SVOCs (excluding PAHs), and inorganic parameters are summarized on Tables 2 through 5, respectively. Overall, the analytical results indicate benzene, toluene, ethylbenzene, and xylenes (BTEX) were present in site soils, although only benzene, ethylbenzene, and xylenes exceed the screening level (Table 1). Similarly, 10 of the PAHs, two other SVOCs, and six metals were detected above the RAF Screening Levels. The RAF Screening Levels are a hierarchical combination of USEPA Regional Screening Levels (RSLs) and Illinois TACO Tier I values. The six metals that were noted above the screening levels include antimony, arsenic, copper, lead, mercury, and zinc. Review of the PAH results (Table 3) along the Figure 7, suggest PAHs are typically associated with the tar, which is often present at depths below the water table.

Following is a discussion of soil quality related to off-site properties:

South: No former MGP structures were ever present on the EJ&E property south of Parcel 2. However, due to the impacts noted at or near the water table on Parcels 1 and 2, impacts may exist in the soil at this elevation on the EJ&E property. To date, no investigation activities are known to have been conducted on this property to the south.

West: Pershing Road (formerly Sand Street), west of the Site, was constructed prior to the MGP and has continually been maintained as a street. The property west of Pershing Road is not known to have been investigated. Furthermore, this property is hydraulically upgradient from the Site.

North: Dahringer Road, north of Parcels 1, 2 and 4. The south shoulder or right-of-way of Dahringer Road has not been investigated along Parcel 1. North of Parcels 2 and 4, PAHs and other SVOCs indicative of MGP residuals were below detection limits in soils.

However, a few CVOCs and other contaminants not associated with MGP residuals were detected in soils below the water table in this area. The presence of these compounds in groundwater and soils below the water table may indicate an off-site source for chlorinated VOCs that require further evaluation. Further evaluation is necessary in this direction.

East: The EJ&E Railroad and the NSSD properties east of Parcels 2 and 4 have not been fully characterized define the extent of MGP residuals and potential impacts from the railroad and other historical sources.

3.6.2 Surface Water Quality

The quality of water present on top of the HDPE liner in the Waukegan Tar Pit located on the Site is unknown. No other additional surface water features have been identified on the Site.

3.6.3 Groundwater Quality

Based on previous investigation activities conducted, the impacts to groundwater have not been fully characterized and DNAPL was encountered in one of the groundwater monitoring wells on the Site.

Groundwater sampling began in 1992, when five monitoring wells were installed by Barr. Two of the monitoring wells were installed on Parcel 1 and the remaining three monitoring wells were installed on off-site property east of Parcel 4. In 2004 Burns & McDonnell installed 14 pairs of wells on Parcels 1 and 2. Groundwater monitoring wells were installed in pairs of one water table well and one piezometer per pair, and well construction information is listed on Table 6. The water table well was installed at an average depth of 12 feet bgs with the top of the well screen straddling the water table/smear zone within the sand unit. The water table wells were set to monitor impacts at the surface of the water table and/or in the smear zone. The piezometer was installed with the bottom of the well set at approximately 6 inches below the top of the clay surface. The piezometers were installed with 5-foot screens touching the sand/clay interface.

Groundwater elevation measurements from August and October 2004 are listed on Table 7. Groundwater elevations were approximately 2 to 3 feet lower during the October 2004 measurement event. Also, monitoring wells MW9S and MW9D both contained DNAPL in October. The groundwater flow direction was generally in an easterly direction during both measuring events. Figures 13 and 14 depict the contours for the August and October 2004 measurements, respectively.

Groundwater samples collected in 2004 were analyzed for TCL VOCs, TCL SVOCs, priority pollutant metals, and amenable cyanide. A summary of the VOCs, PAHs, SVOCs, and inorganic compounds detected in Site groundwater is summarized on Table 8. Specific analytical results from the 2002 and 2004 investigations for VOCs, PAHs, SVOCs (excluding PAHs), and inorganic parameters are summarized on Tables 9 through 12, respectively. The RAF Screening Levels for groundwater are a hierarchical combination of USEPA Maximum Contaminant Levels (MCLs), Illinois TACO Tier I values, and USEPA RSLs. Locations where the RAF Screening Levels area exceeded are shown on Figure 15 and the analytical results indicate the following:

- BTEX and three CVOCs (1,1-dichloroethene, cis-1,2-dichloroethene and vinyl chloride) were present in groundwater. Only benzene, cis-1,2-dichloroethene, and vinyl chloride exceeded the RAF Screening Levels (Table 8), but vinyl chloride was present in well Barr-MW3 (Table 9), which is in the northwest corner of the NSSD property (Figure 15).

- PAHs and six other SVOCs were present in groundwater. Only certain PAHs, dibenzofuran, and bis(2-ethylhexyl)phthalate exceeded the RAF Screening Levels (Table 8), and none of the PAHs or other SVOCs (Tables 10 and 11) exceed the RAF screening levels in the Barr wells MW-3, MW-4, or MW-4D on the NSSD property to the east (Figure 15).

- Arsenic, copper, chromium, lead, mercury, nickel, and zinc were present in groundwater. Only arsenic, chromium, and lead exceeded the RAF Screening Levels (Table 8). Three of the four arsenic concentrations and the only chromium result that exceed the RAF screening levels (Table 12) are in Barr wells MW-3, MW-4, or MW-4D on the NSSD property to the east (Figure 15).

As discussed above, the presence of VOCs, SVOCs and DNAPL in groundwater on-site has been established. Also, since DNAPL collected in one well over a 3 month time frame, DNAPL may be present in other locations on the Site.

The extent of groundwater impacts off-site to the east has been defined, and the analytical data indicate PAHs and other common MGP residuals are absent in these wells while compounds not always associated with historic MGP operations are present to the east. Groundwater to the west (upgradient), north and south of the Site has not been investigated. The source of the chlorinated solvents in groundwater appears to be located to the north of the site based on data collected to-date and this will be further evaluated in this investigation. Analysis of soil and groundwater sampling issues and COPC selection is included in Appendix F (enclosed CD).

3.6.4 Soil Vapor Quality

Soil vapor quality on-Site has not been evaluated. Soil vapor quality may be a concern where buildings already exist and soil/groundwater sampling indicate there is a potential for vapor intrusion. Analysis of soil vapor sampling issues and COPC selection is included in Appendix G (enclosed CD).

3.6.5 Summary of Current Site Conditions

Between 1990 and 2004, several investigations were conducted to define the extent of tar and other residuals in surface and subsurface soil and groundwater. Limited actions were conducted to excavate tar and MGP residuals associated with a release to a ditch in 1968, from the Waukegan Tar Pit in 1991, and from the central portion of the Site in 2003, which is shown on Figure 7. The investigations identified tar in surface and subsurface soil above and below the water table on Parcels 1, 2 and 4, dissolved phase constituents in on and off-site monitoring wells and DNAPL in groundwater in one area of the Site. The 2004 groundwater samples suggest the extent of MGP residuals to the east has been defined, but additional sampling and wells are required to confirm the results. Additional Site investigation activities are discussed in Sections 4 and 6.

3.7 Constituents of Potential Concern (COPCs)

Site-specific constituents of potential concern (COPCs) are based on the USEPA-approved Multi-Site Risk Assessment Framework (RAF) (Exponent 2007), the Conceptual Site Model (CSM), and evaluation of previously collected soil and groundwater data. Soil and groundwater samples were collected at the Site and to the east in the previous investigations discussed above. A summary of previous samples and the compounds for which they were analyzed is summarized on Table B below.

Table B: Previous Site Investigations and the Parameters Analyzed in Soil and Groundwater

Phase of Work/Report	Soil	Groundwater
Weston 1990 - Waukegan Tar Pit Site Assessment	VOCs, PCBs	N/A
Barr 1991 - Waukegan Tar Pit EOC	VOCs, SVOCs, metals	N/A
Barr 1992 - Waukegan Tar Pit Free Tar Removal Action Final Report	VOCs, PAHs	N/A
Barr 1994 - Waukegan Tar Pit Supplemental EOC	VOCs, PAHs	VOCs, PAHs, metals
Dames & Moore 1995 - Site Investigation of Waukegan Tar Pit and Former North Plant MGP	VOCs, SVOCs	N/A
Burns & McDonnell 2002 - Former North Plant MGP Source Delineation Sampling Data Report	VOCs, SVOCs, metals, PCBs, TCLP metals, sulfide, total cyanide, pH, flashpoint	N/A
Burns & McDonnell 2002 - Former North Plant MGP Comprehensive Site Investigation		VOCs, SVOCs, metals, amenable cyanide

The Site COPCs listed below are based on an evaluation of the RAF COPCs found in the RAF and historical soil and groundwater data collected at the Site. Assessment of the COPC list was performed for historic soil and groundwater data using the following screening techniques:

- Maximum constituent concentrations were compared to RAF screening levels (Tables 1 and 8) and constituents that exceeded the screening levels are carried forward (although based on distribution, some of the parameters will be sampled in limited areas);
- Frequency of detection was determined to assess prevalence (Tables 1 and 8) and was used to evaluate whether analytes detected above the screening levels would be carried forward as site-specific COPCs. A 5 percent (%) criterion is a common supplemental criterion used in COPC selection within risk assessments (USEPA 1989); and
- Constituents that exceeded the RAF screening levels with a frequency of detection less than 5% were not carried forward as potential COPCs.

Soil constituents that exceed the RAF screening levels, have a frequency of detection greater than 5%, and are on the Multi-Site RAF COPC list that will be carried forward at the North Plant MGP site include the following:

- VOCs – Benzene and total xylenes;
- PAHs – benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, 2-methylnapthalene, naphthalene and pyrene;
- SVOCs - carbazole and dibenzofuran; and
- Metals – antimony, arsenic, copper, lead, mercury, and zinc.

The two PAHs benzo(a)pyrene and dibenz(a,h)anthracene were the only parameters where the laboratory method detection limit (MDL) always exceeded the RAF screening levels. However, both of these are already included in the COPC list to be carried forward for soil.

A similar analysis was completed for groundwater at the site. Soil constituents that exceed the RAF screening levels, have a frequency of detection greater than 5%, and are on the Multi-Site RAF COPC list that will be carried forward at the North Plant MGP site include the following:

- VOCs – Benzene;
- PAHs – benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and naphthalene;
- SVOCs - bis(2-ethylhexyl)phthalate and dibenzofuran; and
- Metals – arsenic (dissolved), chromium (dissolved), and lead (dissolved).

Three VOCs and seven SVOCs had elevated MDLs in comparison with the RAF screening levels. The achievable MDL for SVOCs 2,2'-oxybis(1-chloropropane), 2,4-dinitrotoluene, 2,6-dinitrotoluene, and hexachlorobenzene exceeds screening levels. The other three compounds (3-nitroaniline, 4-nitroaniline, and 4,6-dinitro-2-methylphenol) are not likely to be remedial drivers (neither are the VOCs) compared with the presence of MGP residual NAPL in the subsurface and the VOC and PAH results previously observed at the Site (Appendix F). Also, carbazole is a coal tar and creosote constituent, so it is expected to co-occur with other MGP residuals on this site and is not a necessary analyte because the PAHs represent this class of compounds.

The proposed COPC list for soil/sediment and groundwater/surface water is listed on Table C below.

Table C: Constituents of Potential Concern

Soil and Sediment COPCs	Groundwater and Surface Water COPCs
BTEX, PAHs, dibenzofuran, antimony, arsenic, copper, lead, mercury, and zinc	BTEX, PAHs, bis(2-ethylhexyl)phthalate, dibenzofuran, dissolved arsenic, dissolved chromium, dissolved lead, and available cyanide.
*cis-1,2-dichloroethene and vinyl chloride will be analyzed in soil on the former MGP property and in borings north and east thereof	*cis-1,2-dichloroethene and vinyl chloride will be analyzed in the five well nests located on the north/northeast end of the site

The form of chromium previously detected on-Site has not been established; therefore, 20% of the groundwater samples collected during the first quarterly sampling event will be analyzed for total and

hexavalent chromium (as requested by USEPA). Thereafter, hexavalent chromium analysis will be discontinued unless it is detected and exceeds the screening levels in any of the water samples. The CVOCs cis-1,2-dichloroethene and vinyl chloride will be analyzed in samples from well nests MW4S/D and MW5S/D, the three proposed nests in the northeast corner, and well Barr-MW-3 (six locations).

An evaluation of the soil vapor COPC list is included in Appendix G (enclosed CD). Based on the review of historic soil and groundwater data, as well as an evaluation of overall toxicity and volatility of detected compounds, the proposed COPC list for soil gas samples is listed below.

- BTEX
- Naphthalene
- 1,2,4-Trimethylbenzene
- Styrene
- Acetone
- Carbon disulfide
- Methyl Ethyl Ketone (MEK)
- 1,1-Dichloroethane
- cis-Dichloroethene
- Vinyl chloride

All of the VOCs listed above were selected based on their detection in site soil or groundwater. The only detected parameter not included is methylene chloride, which is a common laboratory contaminant. The site specific summary of the sampling and analysis plan based on this evaluation is on Table 13.

4 SITE-SPECIFIC CONCEPTUAL SITE MODEL SUMMARY

A Site Specific CSM, presented in Figure 15, was developed for the North Plant Site. The Site Specific CSM is based on the Multi-Site Generalized CSM (Integrys 2007a) and has been refined to reflect site specific conditions observed during previous investigation and reconnaissance activities. The Site Specific CSM provides the framework to identify data needs to characterize the Site and evaluate potential human health and ecological risks.

The Site-Specific CSM and risk assessment approach will be reviewed on an iterative basis to refine the media of concern and individual pathways as more data are generated to ensure the RI report considers the newly collected data. Similarly, as remedial actions are performed, the CSM will be reviewed and revised, if necessary.

4.1 Site Reconnaissance

Throughout the course of field activities that have occurred at the Site over the years, reconnaissance tasks have been conducted. Information regarding Site conditions is contained in the Final Report and Supplemental Extent of Contamination Study (Barr 1994) and the Comprehensive Site Investigation Report (Burns & McDonnell 2005) along with other reports that document field activities. As part of the development of this SSWP, Site reconnaissance was performed that included taking additional field notes, photographing existing conditions at the Site and completing the habitat assessment field forms included as an Appendix to the RAF (Exponent 2007). As discussed previously, the former MGP structures have been removed, the property is covered with gravel, grass, weeds, brush and trees. As part of the site reconnaissance, habitat assessment field forms adapted from the Ecological Risk Assessment Guidance for Superfund (ERAGS) (USEPA 1997) were filled out to document the types of ecological habitat at the Site and surrounding area (Appendix D, enclosed CD).

The primary purpose of the Site reconnaissance was to document the extent of ecological habitat at the Site and evaluate the exposure pathways that are potentially complete for both ecological and human health receptors based on the present site conditions. The following sections describe the media of potential concern and the potential pathways of exposure to the COPCs present in these media to both human and ecological receptors.

4.2 Media of Potential Concern

The Generalized Multi-Site CSM considered the following media as media of potential concern:

- Surface Soil;
- Subsurface Soil;
- Sediment;
- Surface Water;
- Groundwater; and
- Air (associated with soil or groundwater contamination).

These media will also be considered media of potential concern as described in the following sections. These media will be evaluated as part of the risk assessment activities to assess if response actions, including risk management tools, are warranted to manage the potential risk to human health and the environment at the Site. The risk associated with ambient air quality will be assessed as discussed in Section 4.3 considering soil or groundwater contamination may potentially affect ambient air quality.

The risk assessment evaluation of these media will be based on previously collected SI data and data to be collected as described in Section 6 of this SSWP and the Site-Specific QAPP. The previously collected data will be assessed for the adequacy of the data as part of the Site-Specific QAPP. The assessment will consider the age and quality control of the data, detection limits, and the likelihood that the data is still representative of conditions. The Site-Specific QAPP provides evaluation criteria for the use and validation of existing data to be used with newly collected RI data.

4.2.1 Surface Soil

Surface soil is considered a medium of potential concern on the Site. Tar was visibly present on the surface in some areas on the Site. Snow fence was placed around these areas so that landscapers that mow the grass in the summer do not encounter these areas. Surface soils within portions of the Site also have elevated concentrations of MGP-related constituents above human health- based soil screening levels (refer to Section 3.6.1 and Tables 2 through 5). Soil sampling was not conducted in the wetlands onsite, but will be performed as part of the RI to evaluate the surface soil quality in these ecological habitats. Surface soil on Parcel 3, south of the former MGP structures (see Figures 2 and 4) has not been investigated.

As discussed in Section 2, Parcel 3 was formerly owned by NSG but no MGP structures were present in the area. Parcel 3 is currently owned by the City of Waukegan and used as a compositing area. Surface soil samples will be collected on Parcel 3 as discussed in Section 6.4. Surface soil is not considered a medium of potential concern offsite to the west, north or east due to Pershing Road, Dahringer Road, and the EJ&E railroad respectively. Overland migration via surface water runoff is not considered to be a primary pathway, as established in the discussion on the history of the MGP and surrounding areas. Nonetheless, surface soil samples (0 to 3 feet bgs) will be collected from any proposed soil boring locations west of Pershing Road, north of Dahringer Road, or east of the EJ&E Railroad to assess potential human health and ecological risks related to MGP residuals in these areas.

4.2.2 Subsurface Soil

Subsurface soil (greater than 3 feet below ground surface) is considered a medium of potential concern both on the former MGP property and adjacent properties where MGP-residuals may have migrated. Subsurface soil below the groundwater table was characterized both visually and by chemical analysis during investigation activities on Parcels 1, 2 and 4. Subsurface soils within portions of Parcels 1, 2, and 4 have elevated concentrations of MGP-related constituents above human health- based soil screening levels (refer to Tables 3.6.1 and 2 through 5). Subsurface soil has not been characterized on Parcel 3, and limited characterization of subsurface soil has been performed north of the former MGP under Dahringer Road and east of the EJ&E Railroad. Additional subsurface soil sampling will be performed to assess potential human health and ecological risks related to MGP residuals and identify potential source areas.

4.2.3 Sediment

Sediment, if present in the former tar pit, is considered a medium of potential concern at the Site. Sediment quality in the tar pit will be evaluated during the RI to assess potential human health and ecological risks related to MGP residuals. An evaluation of the pond thickness in October 2011 indicates a thin layer of soil and other apparent air-borne particles have accumulated on the top of the Waukegan Tar Pit liner. Near the edges, where water is shallowest, this material may be as much as one-eighth to one-quarter inch (1/8” to 1/4”) thick; in the center of the pond the thickness is estimated to be between one and three inches. Based on the deposition of this material, it may not be able to be collected using conventional sediment sampling methods due to the apparent lack of cohesion (this is discussed in more detail in Section 6.6).

4.2.4 Surface Water

Surface water that is present on top of the Waukegan Tar Pit liner is considered a medium of potential concern at the Site. Surface water samples will be collected during the RI to evaluate the surface water quality of the tar pit and assess potential human health and ecological risks related to MGP residuals. During the October 2011 evaluation of the pond, the water depth was approximately three to four feet in the center of the pond. No fish were observed at this time. Additional assessment for the pond is discussed in Section 6.6.

Surface water is not anticipated to be present in wetland areas (the wetland report characterizes the soil as hydric soil). Water samples from wetland areas will be collected if standing water is present.

4.2.5 Groundwater

Groundwater is considered a medium of potential concern across the former MGP property and possibly on adjacent properties. MGP residuals and non-MGP impacts were identified in groundwater samples collected between September 1992 and October 2004. Monitoring wells MW9S and MW9D installed in August 2004 both contained DNAPL, or tar, in October 2004. Analytical results of samples collected from other wells indicate VOCs and PAHs are present in the groundwater across most of the Site. Other VOCs, including vinyl chloride, chloroethane, 1,1-dichloroethane and 1,2-dichloroethene were reported in groundwater samples. Additional groundwater data are needed to further define the lateral extent of groundwater that may be affected with MGP residuals to the north and east of the former MGP property. Groundwater data will also be collected west of the former MGP property to characterize up-gradient groundwater quality. Groundwater data will also be used to assess potential human health and ecological risks related to the MGP residuals.

4.2.6 Soil Vapor

The Site is currently vacant and free of any structures. It is anticipated to remain this way, based on the planned future use as open space recreational. However, based on the known soil quality and location of former MGP structures, soil vapor is considered a medium of concern on the former MGP property under future use scenarios (e.g., redevelopment included buildings) and will be evaluated for potential risk to human health receptors as described in Section 6.7.

The need to perform a soil vapor assessment on properties adjacent to the former MGP property will be evaluated following additional soil and groundwater data collection, described in Section 6. The approach

for evaluating soil and groundwater data and site-specific conditions (e.g., buildings, utilities, etc.) with respect to soil vapor is included in Appendix G (enclosed CD).

4.3 Potential Exposure Pathways – Human Health

This section evaluates the potential exposure pathways for human health receptors as presented in the Generalized CSM (Integrys 2007a). A site specific evaluation of the Generalized CSM exposure pathways has been considered to develop the North Plant CSM and is summarized on Figure 15. This evaluation considers both current Site use as well as reasonably foreseeable potential future use conditions. The land use scenarios which will be discussed below will include industrial/commercial, recreational, residential and construction worker receptors.

The exposure pathways carried forward in this SSWP will be evaluated as part of the baseline risk assessment activities to assess if response actions, including risk management tools, are warranted to manage the potential risk to human health at the Site. It is understood that without proving unrestricted use and unlimited access is protective of human health for current and future land uses, risk management tools will be required. The methods that will be used to evaluate potentially complete exposure pathways are included in the Multi Site RAF (Exponent 2007), the RAF Addendum (Exponent, 2011) and described in the following sections. For the purpose of the following evaluation, surface material from the wetland areas will be considered to be hydric soil and not sediment.

4.3.1 Industrial/Commercial Land Use Scenario Worker

The former MGP property (Parcel 1), and the surrounding parcels immediately adjacent to the former MGP property are vacant (see Figure 2) and well vegetated. There are no buildings on the former MGP property. The closest buildings are associated with the North Shore Sanitary District, approximately 550 feet east of the former property boundary. Groundwater elevation measurements from August and October 2004 indicate groundwater flows to the east. The former MGP property is anticipated to be open space, recreational land use in the future.

The Generalized CSM considered the exposure route to the industrial/commercial worker was through incidental ingestion, dermal contact, and inhalation of soil (as a result of soil disturbance) and groundwater via dermal contact and vapor inhalation.

Based on the current land use and observations made during the site reconnaissance, industrial/commercial workers may be exposed to surface soils through incidental ingestion of and dermal

contact with surface soil, and inhalation of soil particulates and vapors derived from surface soil. Based on the current land use (vacant), the most likely workers on the property on a regular basis would be landscapers cutting the grass. Landscaping activities could potentially expose the worker to surface soil impacted by tar, but a snow fence was installed to restrict access to these areas and minimize this type of exposure from occurring. Currently, industrial/commercial workers are not exposed to subsurface soil. However, in the future, if subsurface soil were brought to the surface due to excavation activities at the Site, industrial/commercial workers may have similar types of exposure to subsurface soil as described for surface soils.

There is a former tar pit located on the former MGP property, which may contain sediment on top of the liner that was placed at the bottom of the pit after tar was removed from the area. Worker exposure to the surface water and sediment in the former tar pit is expected to be minimal, as there is no reason for workers to contact these media. The potential risks associated with exposure to surface water and sediment in the former tar pit will be assessed qualitatively as described for the recreational user (discussed further in Section 4.3.3.).

Dermal exposure and ingestion of groundwater is not expected due to the depth to groundwater (over 4 feet bgs – below depths encountered for landscaping activities) and public water supply. Groundwater analytical results will be compared to risk-based screening levels for groundwater as specified in the RAF. The assessment will be for informational purposes and will be used to assess if risk management tools are necessary to prevent direct exposure to groundwater.

While groundwater and soil may be a potential source of vapors, there are presently no buildings on the property where vapor intrusion to indoor air could pose a potential risk. There are no plans for buildings at the former MGP in the future. Therefore, vapor intrusion into commercial/industrial buildings as a result of MGP-affected groundwater and soil, is not considered a complete exposure pathway. However, soil vapor probes will be sampled on the former MGP property to evaluate the potential for vapor intrusion pathway to be complete and evaluate if institutional controls would be appropriate to prevent future building on the former MGP property.

The vapor intrusion exposure pathway could only occur in areas where impacted groundwater of soil exists near or beneath occupied buildings. It is not known if the vapor intrusion exposure pathway is complete on adjacent properties.

Therefore, a tiered evaluation will be performed to determine if the vapor intrusion exposure pathway is complete (Section 6.7). If the vapor intrusion exposure pathway is found to be complete, then the risk associated with the exposure pathway will be evaluated in the BLRA.

In summary, the commercial/industrial worker scenario will be assessed using existing data of sufficient quality and new data to evaluate potential risks under the following exposures (Figure 15):

- Incidental ingestion of surface and subsurface soil;
- Dermal contact with surface and subsurface soil;
- Inhalation of soil particles and vapors derived from surface or subsurface soil;
- Incidental ingestion and dermal contact with the former tar pit surface water and sediment; and
- Ingestion and inhalation of vapors associated groundwater.

4.3.2 Construction Worker

The Generalized CSM considered the exposure route to the construction worker was through incidental ingestion, dermal contact, and inhalation of soil (as a result of soil disturbance) and groundwater via dermal contact and vapor inhalation.

Consistent with the Generalized CSM, there is the potential that construction workers may be exposed to surface and subsurface soil and groundwater if portions of the Site are redeveloped or if subsurface utility work occurs. In addition, there would be the potential for construction worker exposure to the former tar pit surface water and sediment if the former MGP property was redeveloped. The exposure pathways to be evaluated for soil and groundwater would be similar to those assessed for commercial/industrial workers. However, because construction workers have the potential for working within an excavation, there is the potential they will come in contact with contaminated groundwater, so the dermal exposure pathway is also evaluated. The exposure pathways associated with excavation activities will be discussed qualitatively in the baseline risk assessment in light of the quantitative screening evaluations that will be performed using the soil and groundwater data for other receptors (i.e., commercial/industrial workers and recreational users).

Using previously collected data of sufficient quality and new data, the potential risks associated with construction worker exposure to soil, groundwater, and the surface water and sediment of the former tar pit will be evaluated, including:

- Incidental ingestion of surface and subsurface soil;
- Dermal contact with surface and subsurface soil;
- Inhalation of soil particles and vapors derived from surface or subsurface soil;
- Incidental ingestion and dermal contact with the former tar pit surface water and sediment;
- Incidental ingestion, inhalation, and dermal contact with groundwater associated with excavation activities).

4.3.3 Recreational Land Use Scenario – Visitor/Trespasser

The Generalized CSM considered the exposure route to the recreational visitor/trespasser was through incidental ingestion and dermal contact with surface soil, sediment and surface water. Subsurface soil exposure may also potentially occur in the future if excavation of subsurface soils occurs as part of site redevelopment. The City of Waukegan Lakefront Downtown Master Plan dated July 2003 (City of Waukegan 2003) calls for the former MGP property to be redeveloped into an open space recreational area. Under current and future land use conditions, there is the potential that recreational users and visitors/trespassers may be exposed to surface soil, surface water and sediment in the former tar pit.

As discussed in Section 2.3.5, the former tar pit was excavated in 1992 and covered with HDPE. The former tar pit is small (i.e., less than approximately an acre in size) and shallow (exposing the HDPE liner at the edges with a maximum depth of approximately 4 ft). Swimming in the former tar pit is unlikely and the amount of wading that would occur would be expected to be limited based on the size and nature of the pit. Considering the pit's small size and shallow nature, it would not be expected to contain fish.

Consistent with the commercial/industrial worker exposure scenarios, recreational user exposure to groundwater is not expected under current and future use scenarios because groundwater is inaccessible and not used as a drinking water source. Groundwater analytical results will be compared to risk-based screening levels for groundwater as specified in the RAF. The assessment will be for informational purposes and will be used to assess if risk management tools are necessary to prevent exposure to groundwater. Inhalation of groundwater is not considered a pathway because the current and future land use scenarios are open space, without buildings, and therefore the groundwater vapor intrusion pathway is not possible.

The potential risks to the recreational user and visitor/trespasser associated with potential exposure to soil, and former tar pit surface water and sediment will be evaluated within the baseline risk assessment. The risk evaluation to be completed will be semi-quantitative in nature and use comparisons to health-based screening values for soil and groundwater. The exposure pathways to be evaluated using these health-based screening values include:

- Incidental ingestion of surface and subsurface soil;
- Dermal contact with surface and subsurface soil;
- Inhalation of soil particles and vapors derived from surface or subsurface soil;
- Incidental ingestion and dermal contact with the former tar pit surface water and sediment; and
- Ingestion of groundwater.

4.3.4 Residential Land Use Scenario

Currently, the Site does not extend into any residential areas and there are no plans that include residential development in the future on the former MGP property or immediately adjacent properties. Therefore, under the future development scenario, residential use of the site is not anticipated. However, residential screening evaluations will be performed as part of the baseline risk assessment for informational purposes to evaluate the risks associated with soil, groundwater, and former tar pit sediment and surface water under a residential development scenario. The results of these residential screening scenarios will be used evaluate if there is a need for institutional controls to be prevent residential development of the Site in the future.

4.4 Potential Exposure Pathways – Ecological Receptors

This section evaluates the potential exposure pathways for ecological receptors as presented in the Generalized CSM. A site specific evaluation of the Generalized CSM exposure pathways has been considered to develop the Site Specific CSM. The methods that were used to evaluate the potential exposures to these ecological receptors are discussed in the Multi Site RAF (Exponent 2007). The habitat assessment forms are included in Appendix D (enclosed CD) and provide the detailed results of the habitat assessment completed to refine the site-specific CSM. The results of the habitat assessment are used throughout the description of the ecological CSM to provide site-specific rationale for including or excluding specific ecological receptors from further evaluation within the risk assessment.

4.4.1 Mammals

The Generalized CSM considered carnivorous, piscivorous, insectivorous, omnivorous, and herbivorous mammals as an ecological receptor that may be exposed to COPCs through incidental ingestion and dermal exposure of soil, sediment, and/or surface water and ingestion of plant and prey items.

Based on reconnaissance and the ecological assessment conducted, the Site provides sufficient habitat for terrestrial mammals, such as deer and raccoons. The Site is primarily open field with the eastern portion a mix of shrub/scrub and deciduous trees. The presence of the former tar pit may attract mammals to this location as a source of drinking water for local mammals. For these reasons, potential risk to mammals from exposure to surface soil, subsurface soil, and tar pit sediment and surface water will be evaluated in the baseline risk assessment. Soil concentrations will be compared to ecological soil screening levels and the former tar pit sediment and surface water will be compared to ecological screening levels.

It should be noted that the ecological soil screening values used for the ecological screening assessment are not specific to just terrestrial mammals, but also take into account information on other terrestrial ecological receptors, such as birds, plants, and soil invertebrates when available. Therefore, the soil screening evaluation performed for mammals will be protective of a wider range of terrestrial ecological receptors rather than just mammals. The surface water and sediment ecological screening values are primarily developed to be protective of aquatic invertebrates that live their entire life in a surface water body. These screening values provide a conservative point of comparison for evaluating risks to terrestrial receptors that only contact or drink the water.

4.4.2 Birds

The Generalized CSM considered carnivorous, piscivorous, insectivorous, omnivorous, and sediment-probing birds as an ecological receptor that may be exposed to COPCs through incidental ingestion and dermal exposure of soil, sediment, and/or surface water and ingestion of plant and prey items.

Ducks and seagulls were observed using the area of Lake Michigan and Waukegan Harbor, southeast the Site, during past investigations. Most other avian species migrate south for the winter. However, based on the reconnaissance and the ecological assessment conducted, sufficient habitat exists in the area for birds. Carnivorous, herbivorous and insectivorous bird species may forage on the Site. The presence of the former tar pit may attract birds to this location as a source of drinking water for local birds,

and may provide a source of prey too (i.e., aquatic invertebrates). Consistent with the habitat provided at the Site for mammals, the bird habitat is considered sufficient. Potential risk to birds from exposure to surface soil and tar pit sediment and surface water will be evaluated in the baseline risk assessment. Subsurface soil is unlikely to be encountered by birds, unless subsurface soil is brought to the surface through soil disturbance associated with development activities. Similar to mammals, the potential risk to birds will be addressed by comparison to the same ecological screening levels described previously in Section 4.4.1.

4.4.3 Terrestrial Plants and Soil Invertebrates

The Generalized CSM did not specifically identify plants and soil invertebrates as ecological receptors that would be evaluated as part of the ecological risk assessment. This is because in general these terrestrial ecological receptors tend to be less sensitive to MGP related contaminants than the other terrestrial ecological receptors already considered as part of the CSM (i.e., mammals and birds). However, plants and soil invertebrates form the base of the food chains that the mammal and birds rely upon plants and soil invertebrates for much of their energy needs. As noted in Section 4.4.1 above, the ecological soil screening levels applied to screen soils for potential risks to bird and mammals, also will be used to assess potential risks to plant and soil invertebrates too, as data on plant and soil invertebrate health were used when available by EPA to derive these ecological soil screening levels.

4.4.4 Fish

The Generalized CSM considered fish as an ecological receptor that may be exposed to COPCs through incidental ingestion and dermal exposure of surface water, sediment and/or ingestion of food. Based on the size of the pond (approximately 0.3 to 0.4 acres), the depth of water in the former tar pit (estimated to be up to three to four feet in the central portion of the former pit), and the HDPE liner prohibiting connection with the shallow groundwater table, it is unlikely fish are present within the pond and none have been observed during past reconnaissance or investigation activities. For that reason, fish are currently not included as a potential ecological receptor for further consideration in the risk assessment. However, to further support not including fish in the CSM, an additional habitat assessment (using the format completed in Appendix D) will be performed in the warm months when vegetation is growing and fish, if present, would be observed. If fish are observed, the site-specific CSM will be refined to include fish as a potential receptor.

4.4.5 Benthic Invertebrates

The Generalized CSM considered benthic invertebrates as an ecological receptor that may be exposed to COPCs in sediment and surface water. Benthic invertebrates may be present in the former tar pit, but none have been recorded or observed during past reconnaissance or investigation activities and they may be absent given that the pond is completely isolated from other water bodies. However, the potential risk to benthic invertebrates from exposure to tar pit sediment and surface water will be evaluated in the baseline risk assessment. Ecological screening levels for surface water and sediment will be used to evaluate the potential risks to benthic invertebrates in the former tar pit. Evaluating the potential risk to benthic invertebrates will also provide support to evaluations for fish and mammals as discussed in Section 2.3.3 of the Multi-Site RAF.

4.4.6 Amphibians

There are four small wetland areas located on the former MGP property. During the spring these wetlands may become flooded and potentially provide a brief period for formation of vernal pools in which amphibians (e.g., frogs) could breed. The small former tar pit, which holds surface water year round, may be another potential breeding area for frogs. The potential risk to amphibians (e.g., frogs) will be assessed in the risk assessment in two different ways. In the wetland environment, where hydric soils are present, the comparisons to ecological soil screening values will be used to evaluate if the soils could pose a risk to amphibians. In the former tar pit, the ecological screening levels for surface water and sediment will be used to address if there is a potential risk to amphibians using this habitat.

4.5 Data Needs

As described in previous sections of this SSWP, the media that require further assessment and/or were not fully addressed by previous work with respect to delineation and ability to evaluate human health and the environment include the following:

- North: Surface and subsurface soil sampling will be conducted by advancing borings on the north side of Dahringer Road. Data collected will be used to assess current conditions and whether any MGP residuals are present as well as provide additional data for assessment of alternatives and pathways. Groundwater monitoring wells will also be installed and sampled to assess current conditions and groundwater flow, determine if MGP residuals are present and provide additional data to support the risk assessment, migration pathways, and the FS. Additional information regarding the suspected source of chlorinated VOCs in the groundwater will also be obtained;

- West: Surface and subsurface soil sampling will be conducted by advancing borings in the Pershing Road right-of-way (ROW) and east of the Union Pacific Railroad tracks. Data collected will be used to assess current conditions and whether MGP residuals are present as well as provide additional data for assessment of alternatives and pathways. Groundwater monitoring wells will also be installed and sampled to assess current conditions and groundwater flow, determine if MGP residuals are present and provide additional data to support the risk assessment, migration pathways, and the FS;

- Parcel 1: surface soil sampling (0 to 3 feet) will be conducted in the wetland located in southwest corner of Parcel 1. Soil vapor samples will also be collected across the former MGP property in areas where MGP-residuals were previously detected in soil or where former MGP structures were located. Data collected will be used to assess current conditions and whether MGP residuals are present as well as provide additional data to support the risk assessment, migration pathways, and the FS;

- Parcels 2 and 4: surface soil sampling (0 to 3 feet) will be conducted in the wetlands located in Parcels 2 and 4. Former tar pit surface water and sediment samples will also be collected. Data collected will be used to assess current conditions and whether MGP residuals are present as well as provide additional data to support the risk assessment, migration pathways, and the FS;

- Parcel 3: surface and subsurface soil sampling will be conducted by advancing borings across the property currently owned by the City of Waukegan. Data collected will be used to assess current conditions and support the risk assessment, migration pathways, and the FS. One groundwater monitoring well nest will be installed and groundwater screening samples will be collected to evaluate the need for additional groundwater monitoring wells;

- South of Parcel 2: surface and subsurface soil sampling will be conducted by advancing borings. Data collected will be used to assess current conditions and support the risk assessment, migration pathways, and the FS;

- East: surface and subsurface soil sampling will be conducted by advancing borings east of the EJ&E Railroad tracks. Data collected will be used to assess current conditions and support the risk assessment, migration pathways, and the FS. Groundwater monitoring wells will be installed and sampled to assess current conditions and support the risk assessment, migration pathways, and the FS. The groundwater results will also be used to assess the need for additional potential vapor intrusion assessments on adjacent properties; and

- All properties: All of the new and existing groundwater monitoring wells will be sampled to evaluate concentrations and trends and support the risk assessment, migration pathways, and the FS.

5 PROJECT SCOPING AND PLANNING ACTIVITIES

5.1 Project Scoping (Task 1)

As defined in the SOW, attached to the AOC, the scope of this project includes:

- Task 1: Project Scoping and RI/FS Planning Documents
- Task 2: Community Relations and Technical Assistance Plan
- Task 3: Site Characterization
- Task 4: Remedial Investigation Report (including human health and ecological risk assessment)
- Task 5: Treatability Studies (if needed)
- Task 6: Development and Screening of Alternatives (Technical Memoranda)
- Task 7: Detailed Analysis of Alternatives (FS Report)
- Task 8: Progress Reports

Task 1, Project Scoping and RI/FS Documents included the use of Multi-Site documents which set forth general approaches and concepts with the intent of streamlining preparation of work plans and minimizing review times for future deliverables. In addition, the Multi-Site documents provide a consistent approach to investigating and assessing North Shore Gas's sites. Multi-Site documents include:

- Multi-Site Health and Safety Plan, Rev 2 (August 2007)
- Multi-Site Quality Assurance Project Plan, Rev 2 (September 2007)
- Generalized Conceptual Site Model, Rev 1 (August 2007)
- Multi-Site Risk Assessment Framework, Rev 0 (September 2007)
- Multi-Site Field Sampling Plan, Rev 4 (September 2008)
- Multi-Site Feasibility Study (FS) Support Documents (in progress)

These documents are intended to set forth the general approaches and concepts for performing RI/FS activities.

Previously collected data and observations are included in other investigation-related reports discussed in Section 2 of the SSWP. The findings from investigations performed on the North Plant Site, recently conducted reconnaissance efforts, historical Site reports, and historical information obtained from the NSSD, were used as the basis for developing this SSWP.

5.2 Approach

Previously conducted Site activities have generated a significant amount of data for characterizing Site conditions. The activities proposed in this SSWP will focus on the supplementing previously collected data to refine migration and exposure pathways identified through the CSM and Site reconnaissance.

Sampling activities will also be completed to gather data that can be used to support human health and ecological risk assessments and feasibility study evaluations. A dynamic work plan approach has been developed to collect the data necessary to satisfy the Data Quality Objectives (DQOs) and address concerns regarding specific pathways.

Representatives from USEPA, USEPA's technical support team, North Shore Gas and Natural Resource Technology will participate in technical meetings to mutually resolve problems, as necessary.

5.3 Project Management Communications

The Site-Specific FSP included in Appendix E (enclosed CD) includes a flow chart presenting the lines of communication that will be used during field activities with the contact information. Additional team members may be added throughout the project duration.

It is anticipated that during field activities that require rapid decision-making, at a minimum a weekly meeting will be held to provide a schedule update and to discuss problems that have occurred and resolutions that have been implemented. The frequency of these meetings may be increased depending on the specific activity being performed.

These meetings will include the USEPA Remedial Project Manager (Ross Delrosario), North Shore Gas Project Coordinator (Naren Prasad), and the Natural Resource Technology Project Manager (Jennifer Kahler) and/or Study Leader (Eric Kovatch).

5.4 Purpose and Data Quality Objectives Review

DQOs for the North Plant Site are consistent with the DQOs presented in the Multi-Site QAPP (Integrys 2007b). As discussed in Section 1, data will be collected during the RI activities to satisfy the following site-specific objectives:

- Evaluate the nature and extent of MGP residuals in surface soil, subsurface soil, groundwater, and soil vapor at the Site as well as surface water and sediment related to the former Waukegan Tar Pit;
- Support development and evaluation of potential remedial alternatives (feasibility studies), if response actions are necessary; and
- Collect data to support a baseline risk assessment for human health and the environment and evaluate the potential risk for human health receptors.

5.5 Preliminary Objectives for Remedial Action

The objectives for remedial action will be developed as part of the FS tasks described in Section 8.1.1. In general, the remedial action objective is to protect public health, welfare and/or the environment from impacts related to the Site that may pose a risk and if a risk is present, reduce the risk.

5.6 Preliminary Remedial Action Alternatives

The remedial action alternatives will be developed as part of the FS tasks described in Section 8.2 and will include site-specific evaluation of Applicable or Relevant and Appropriate Requirements (ARARs) and To Be Considered (TBC) requirements.

Remedial action alternatives were previously evaluated before selecting the response actions discussed in Section 2.4. These response actions may be reviewed and updated to reflect current Site conditions. In general, the following responses (but not limited to) may be appropriate to address MGP residuals:

- **Groundwater and Surface Water (including subsurface soil below the water table)**
  - Containment
  - Active remediation (in-situ or ex-situ)
  - Monitored natural attenuation
  - Institutional controls

- **Soil and Sediment (surface soil and subsurface soil above the water table)**
  - Removal and disposal (previous response action)
  - Capping/containment
  - In-situ treatment
  - Ex-situ treatment
  - Additional Institutional controls

5.7 Community Relations (Task 2)

North Shore Gas is prepared to provide community relation support if requested by USEPA.

6 SITE CHARACTERIZATION AND ASSESSMENT ACTIVITIES

The scope of supplemental RI Site characterization and assessment activities addressed by this SSWP includes:

- Mobilization Planning;
- Supplemental Site-wide survey work;
- Supplemental Site reconnaissance;
- Surface and subsurface soil sampling;
- Pond Assessment;
- Sediment Sampling;
- Surface Water Sampling;
- Additional groundwater monitoring well installation; and
- Groundwater sampling.

Sampling locations, frequencies, analytical parameters, and methods to be used are presented below and specific standard operating procedure (SOP) documents from the Multi-Site QAPP (Integrys 2007b) are referenced. Work preparation, mobilization, site-specific dynamic sampling and analysis techniques, investigative-derived waste management, record keeping, sample analysis and validation, and data evaluation processes are also discussed. Project files, as described in SOP SAS-01-02 will be maintained for North Shore Gas at the Natural Resource Technology office.

The planned field activities will be completed in accordance with the methods and techniques described in the Multi-Site QAPP (Integrys 2007b), RAF (Exponent 2007) and RAF Addendum (Exponent, 2011), and FSP (Integrys 2008). These general methods and techniques are not repeated herein. Site-specific information relevant to these Multi-Site documents are discussed below and details are included in Appendix E (enclosed CD).

6.1 Mobilization Planning

6.1.1 Pre-Mobilization

Field mobilization activities will be completed in accordance with Section 3 of the Multi Site FSP, Revision 4, dated September 2008 (Integrys 2008) and SOP SAS-05-01. These activities include:

- Making arrangements for access to adjacent properties not owned by NSG (being addressed by North Shore Gas).
- Utility notification/and location through JULIE - Illinois Diggers Hotline and, if necessary, a private contractor. The City of Waukegan and NSSD representatives will need to be contacted directly for locating storm sewers, sanitary sewers and water main line.
- Establishing a communication structure for field to office personnel and for North Shore Gas and USEPA/Illinois EPA so that they are also kept aware of the status of field activities.

6.1.2 Daily Planning

Daily planning will occur as described in the Multi-Site FSP and the Site-Specific HASP including but not limited to:

- Daily progress tracking;
- Problem identification and resolution;
- Communications from field to office managers, North Shore Gas and USEPA, as appropriate to insure decision points and objectives for the work are fulfilled;
- Safety meetings.

A field log book will be maintained following the procedures outlined in SOP SAS-01-01.

6.1.3 Demobilization

Generally, demobilization planning will occur during the pre-mobilization planning, as NRT staff and its subcontractors plan for the field activities. Any issues regarding final Site status will be identified during the planning process (e.g. ensuring that landscaping issues are addressed, etc.).

6.2 Site Surveying and Map Development

Numerous surveying efforts have been completed over the years to identify sampling locations and notable features. Generally, the survey datum used was North American Datum 1983 (NAD83) (Illinois East state plane coordinates) for Lake County. A new survey will be completed in accordance with the survey methods in Section 7 of the Multi-Site FSP and SOP SAS-02-02. This will allow for Site features to be accurately located and conversion of the survey points to the Universal Transverse Mercator (UTM) projection, which is required by USEPA, is consistent.

Updated survey work and mapping will include:

- Establishing additional location survey information, if needed, such that drawings and maps that can be updated to show current Site features, particularly on properties not owned by North Shore Gas (e.g., EJ&E and City of Waukegan property).
- Establishing new survey control points so that future Site activities (e.g. soil boring locations, additional wells, etc.) can be accurately located and tied to a common datum as work progresses.
- Determining the typical or average water level elevation and depth of water in the tar pit through soundings.
- Surveying the location and elevation of new boring locations and wells.

6.3 Supplemental Site Reconnaissance

Site reconnaissance activities have occurred throughout the past several years on portions of the Site. In accordance with the Multi-Site RAF (Exponent 2007), additional reconnaissance were conducted and documented to support the Site-Specific CSM developed in Section 4 of this SSWP. As part of the reconnaissance, Habitat Assessment Field Forms, including the Ecological Assessment checklist was completed and is included in Appendix D (enclosed CD). To further support not including fish in the CSM, an additional habitat assessment (using the format completed in Appendix D) will be performed in the warm months when vegetation is growing and fish, if present, would be observed. If fish are observed, the site-specific CSM will be refined to include fish as a potential receptor.

6.4 Surface and Subsurface Soil Exploration and Sampling

As discussed previously soil, sediment, surface water and groundwater samples will be collected on the Site and surrounding areas. Very limited or no investigation has been previously performed on adjacent properties. The proposed investigation is intended to define the extent of MGP residuals and whether impacts extend off-Site. These properties include:

- Pershing Road and the ROW to the west, which is hydraulically upgradient from the Site.
- Dahringer Road and property to the north owned by ComEd. Several borings along the south side of Dahringer Road immediately north of Parcels 2 and 4 exhibited CVOCs from an undefined source in groundwater and subsurface soil samples collected below the water table.
- The EJ&E Railroad and the NSSD properties east of the Site have not been characterized to define the eastern (downgradient) extent of potential MGP impacts.
- City of Waukegan property to the south has not been investigated to define the southern extent of potential MGP impacts.

The sampling and analysis summary is presented in Table 13 and is described in more detail below. The proposed boring and monitoring well locations must remain flexible and respond to conditions observed in the field. Existing off-Site boring locations may be modified, or additional boring locations added, in response to encountering visual, olfactory and/or PID evidence of MGP residuals. When such conditions are unexpectedly encountered in borings at locations intended to define the limits of MGP impacts, the general approach will include the following:

- Notify IBS and NRT management representatives to discuss the findings.
- Determine whether additional areas for investigation have been cleared for underground utilities and identify whether there are any additional impediments to stepping out with an additional boring.
- Select a location based on other nearby boring results. It is anticipated the additional boring(s) will be placed in line with other planned off-property borings (Figure 17).
- Placement of additional boring(s) further away from the former MGP property (in contrast to the lines of planned points on Figure 17) will require input and evaluation by the IBS management team. The relative location of additional sampling points will be discussed internally and, if possible based on existing access agreements, these additional sampling points will be installed as part of the current investigation activities.
- USEPA will be informed of the decision to complete additional sampling locations and the general area in which the points will be placed will be identified.

6.4.1 North Plant Site

Soil above and below the water table at the North Plant Site has been investigated with the exception of Parcel 3, which is currently owned by the City of Waukegan. Limited soil samples are proposed for Parcels 1, 2 and 4. Parcel 3 has not been investigated due to the fact that no MGP structures nor any known MGP operations occurred on this parcel.

Ten borings were performed on Parcels 1 and 2 along and within 100 feet of the southern boundary (Figures 6 and 7). The analysis of 22 samples collected from these locations indicated little evidence of MGP residuals. BTEX was below detection limits in twenty samples and no samples exceeded a residential soil screening level for any VOCs or naphthalene. Benzo(a)pyrene exceeded the residential soil screening level in less than half of the samples and always within the upper eight feet bgs. Where benzo(a)pyrene exceeded the soil screening level, benzo(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene often exceeded their respective soil screening levels (150 µg/kg or less). Lead was the only metal exceeding its residential soil screening level at one location (SB176, 6'-7').

Six surface soil samples from the 0–1 foot depth interval will be collected in the identified wetland areas on Parcels 1, 2, and 4 (Figure 17). The results will be used in the ecological screening assessment and/or human health risk assessment. Based on anticipated conditions, samples will be collected using a hand auger.

Currently, the City of Waukegan uses the northern end of Parcel 3 for stockpiling yard waste, and the piles present on this property are estimated to be 20 to 30 feet above current grade. Therefore, boring locations will be selected to avoid these piles as well as any areas where historic asphalt grindings were also once stockpiled (due to the presence of PAHs in the asphalt, which will mimic MGP residuals). Surface and subsurface soil will be sampled on Parcel 3 and the adjacent EJ&E property along the boundary where MGP operations occurred.

Samples will be collected to assess current conditions and to assess whether any MGP residuals are present and, if present, delineate the extent of the impacts as well as provide additional data for assessment of alternatives and pathways. Proposed soil boring locations on Parcel 3 and the area to the east are shown on Figure 17. Four borings will be performed south of the Parcel 1 and 2 boundaries (Figure 17) with samples collected above the water table (estimated at 7 feet bgs) at the 0–1, 1-3, and 5–7 foot depth intervals. Three additional borings will be performed along the eastern boundary of Parcel 3. The borings along the eastern boundary will be sampled at the same depth intervals as above and will

also collect grab samples five feet below the water table at each location for groundwater quality. These groundwater samples will assess the potential presence of MGP residuals in upgradient soil that may be impacting groundwater quality. All borings will extend to the top of the silty clay unit to assess visual and olfactory evidence of MGP residuals. If MGP compounds are suspected at depth, additional soil and/or groundwater samples may be collected as deemed appropriate. At least one monitoring well nest will be installed east of Parcel 3 and south of Parcel 2 as shown on Figure 17. The need for additional groundwater monitoring wells will be discussed with USEPA representatives and evaluated as discussed in Section 6.5.5.

6.4.2 Dahringer Road / Former Tannery

No former MGP structures or operations were located north of Dahringer Road on the former Tannery property. A limited investigation of soil below the water table was completed north of Parcels 2 and 4 in Dahringer Road by Barr in 1992 (B-47/47A and B48/48A, Figure 6). Tar was observed in borings performed in the wetland along the north property boundary of Parcel 2. Analytical results indicated the presence of VOCs.

In the northeast corner of Parcel 1, stained soil, sheens and odors were observed in borings performed within the area of the former above-ground oil tank (B-42A/B, Figure 6). Little evidence of MGP residuals was found in the central portion of the north property boundary (SP101 and SP102, Figure 6). No samples exceeded a residential soil screening level for BTEX, naphthalene, or metals. Three samples collected in the upper 7 feet bgs exceeded a residential soil screening level for benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene and/or indeno(1,2,3-cd)pyrene.

Additional surface and subsurface soil samples will be collected from locations north of the Site to assess current conditions, whether MGP residuals are present beyond the road, and to provide additional data for assessment of remedial alternatives and exposure pathways. Sampling north of Dahringer Road will focus on defining the extent of MGP residuals north of the above-ground gas holder, the above-ground oil tank, the wetland areas, and the extent/presence of VOCs observed north of Parcel 2.

Five borings will be performed along the north side of Dahringer Road (Figure 17) with samples collected above the water table (estimated at 7 feet bgs) at the 0–1, 1-3, and 5–7 foot depth intervals. All borings will extend to the top of the silty clay unit to assess visual and olfactory evidence of MGP residuals. If MGP compounds are suspected at depth, additional soil and/or groundwater samples may be collected as deemed appropriate.

The soil borings will also be used to establish optimal locations for installation of two groundwater monitoring wells. Proposed locations for these wells are shown on Figure 17 unless field evidence of MGP residuals dictates their relocation. These monitoring wells will be water table wells. If field evidence of MGP compounds are observed at depth, piezometer nests will also be installed.

6.4.3 Pershing Road Right–of-Way (ROW)

No former MGP structures were located west of Pershing Road or on Union Pacific Railroad property (located even further west of the site). The eastern side of Pershing Road (formerly Sand Street) has always been the western limit of the former MGP. Surface and subsurface soil has not been investigated.

Twenty one borings were performed and 39 samples collected for analysis along and within 50 feet of the western boundary of Parcel 1 (Figure 6). Borings performed within the above-ground gas holder (SB01, SB02, SB109) and purifier boxes (SB10, SB11, SB119) on the northwest portion of the Site noted the presence of tar, stained soils, and sheens. SB109 exhibited elevated concentrations of benzene, naphthalene, and other PAHs in shallow soils (3-4 feet bgs). However, benzene and naphthalene were below the RAF residential screening levels in all other borings along this boundary.

Samples collected south of the purifier boxes indicated little evidence of MGP residuals. BTEX and naphthalene were below detection limits in most samples and exceeded a residential soil screening level only for xylenes in SB169 (8'-9'), just north of the small wetland in the southwest corner of Parcel 1 (Figure 6). Benzo(a)pyrene exceeded residential soil screening level in less than half the samples and always within the upper eight feet bgs. Where benzo(a)pyrene exceeded the soil screening level, benzo(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene and indeno(1,2,3-cd)pyrene often exceeded their respective soil screening levels (150 µg/kg or less). Arsenic was the only metal exceeding its RAF residential soil screening level and at one SP150 (2'-3') along the central portion of the west property line (south of the compressor plant, Figure 6).

Based on the above existing data, sampling west of Pershing Road, within the ROW, will focus on defining the extent of MGP residuals west of the above-ground gas holder and purifier boxes. Four borings will be performed along the northern portion of Pershing Road (Figure 17) with samples collected above the water table (estimated at 7 feet bgs) at the 0–1, 1-3, and 5–7 foot depth intervals. All borings will extend to the top of the silty clay unit to assess visual and olfactory evidence of MGP residuals. If MGP compounds are suspected at depth, additional soil and/or groundwater samples may be collected as deemed appropriate.

A water table well will be installed upgradient of the former gas holder to establish the presence/absence of MGP residuals in groundwater. Four additional borings will be performed along the central and south portions of Pershing Road (Figure 17) to screen for potential MGP residuals. Samples will be collected above the water table (estimated at 7 feet bgs) at the 0–1, 1-3, and 5–7 foot depth intervals. All borings will extend to the top of the silty clay unit to assess visual and olfactory evidence of MGP residuals. If MGP compounds are suspected at depth, additional soil and/or groundwater samples may be collected as deemed appropriate.

Two additional water table wells will be installed along the central and southern portions of Pershing Road (Figure 17) to establish the upgradient extent of PAHs observed in groundwater in well nests MW8, MW11, and MW13.

6.4.4 EJ&E Property

No former MGP structures were present on the EJ&E property east of Parcel 2. A limited investigation of soil above and below the water table was completed in Parcels 2 and 4 by Barr in 1992. Analytical results indicated the presence of BTEX and SVOCs. Tar was visually identified in borings along the east boundaries of Parcels 2 and 4, except at the southeast corner.

Additional surface and subsurface soil samples will be collected from soil borings east of the Site to assess current conditions, whether MGP residuals are present, and provide additional data for assessment of remedial alternatives and exposure pathways. Eight borings will be performed along the eastern portion of the EJ&E property Road (Figure 17) with samples collected above the water table (estimated at 7 feet bgs) at the 0–1, 1-3, and 5–7 foot depth intervals. All borings will extend to the top of the silty clay unit to assess visual and olfactory evidence of MGP residuals. If MGP compounds are suspected at depth, additional soil and/or groundwater samples may be collected as deemed appropriate. The soil borings will also be used to establish optimal locations for installation of groundwater monitoring wells.

Three existing monitoring wells have been installed at two locations on this property that exhibit no BTEX or PAHs in groundwater. Piezometer nests will be installed at three additional locations (Figure 17) to evaluate groundwater quality downgradient of the Site. These piezometer nests will consist of one water table well and one piezometer installed just above the silty clay unit. If field evidence of MGP residuals are observed at depth, the depth of the piezometers may be modified.

No former MGP structures were present on the EJ&E property south of Parcel 2. This property has historically been vacant. Surface and subsurface soil samples will be collected from soil borings south of Parcel 2 as described above.

6.4.5 Sampling Methods and Abandonment

Following is a brief overview of soil boring methods and procedures which are described in more detail in the Multi-Site QAPP (Integrys 2007b) and FSP (Integrys 2008). Locations will be identified and recorded in accordance with SOP SAS-03-03 to ensure a follow-up survey is possible. Drilling methods will be completed using hollow-stem auger, hydraulic push-sampling, or roto-sonic drilling methods. Currently, it is anticipated borings completed solely for soil sampling purposes will be performed using hydraulic push-sampling methods while the borings for well construction purposes will be completed using hollow-stem auger or roto-sonic drilling methods. However, roto-sonic or other methods may be used if site conditions warrant and such modifications to the drilling program will be communicated to USEPA representatives prior to implementing an alternative drilling method.

Field equipment will be calibrated as required by SOP SAS-02-01 prior to use. During drilling, soil borings are continuously sampled for field screening according to SOP SAS-06-01 to document subsurface conditions and if necessary identify samples for laboratory analysis. Field screening will occur in accordance with the methods and screening techniques identified in the Multi-Site FSP (Integrys 2008). Grab samples will be collected for BTEX and the samples for PAHs, dibenzofuran, antimony, arsenic, copper, lead, mercury, and zinc will be collected thereafter. The CVOCs cis-1,2-dichloroethene and vinyl chloride will be analyzed in soils on the former MGP property and in borings north and east thereof. As appropriate, grab samples will also be collected that define the vertical extent of soil impacts, particularly in areas where NAPL may be encountered. QC samples will be collected with the frequency described in Table 8 and SOP SAS-04-03. A subset of samples will be analyzed for physical parameters including carbon black, TOC, grain size, and percent solids (Table 13).

Soil samples will be classified in accordance with SOP-SAS-05-02. Visual observations and odors will also be logged . A logging guidance developed specifically for MGP investigations that will be used to assist the field team in describing tar in borings is included in this SOP and listed on Table D (below). If observations or field screening results suggest soil is impacted by a potentially unrelated source, it will be noted on the drilling logs. As discussed previously, EJ&E reportedly dumped gypsum alongside the tracks for several years.

If gypsum is identified by the field team, samples will be labeled and packaged in accordance with SOP SAS-03-01 and shipped via overnight carrier or on-site courier using chain of custody procedures described in SOP SAS-03-02. Equipment will be decontaminated after use in accordance with SOP SAS-04-04.

Table D: Standard Descriptors for NAPL Observations

Descriptive Term	Standard Descriptors for Visual Observations of NAPL
No Visible Evidence	No visible evidence of oil on soil or sediment sample
Sheen	Any visible sheen in the water on soil or sediment particles or the core
Staining	Visible brown or black staining in soil or sediment; can be visible as mottling or in bands; typically associated with fine-grained soil or sediment
Coating	Visible brown or black oil coating soil/sediment particles; typically associated with coarse-grained soil or sediment (i.e. coarse sand, gravels, and cobbles).
Oil Wetted	Visible brown or black oil wetting the soil or sediment sample; oil appears as a liquid and is not held by soil or sediment grains

6.5 Groundwater Evaluation

6.5.1 Existing Well Evaluation

The integrity of existing groundwater monitoring wells will be assessed by observing whether the surface seal is cracked, well covers are missing, etc. The Well Condition Field Form, contained in the Multi-Site FSP (Integrys 2008) will be completed anytime a well is sampled or the water elevation is measured as part of continued groundwater monitoring. Also, the field measurements of total well depth will be compared to the monitoring well logs annually to detect any potential siltation issues with a well. The wells will also be redeveloped in accordance with the methods discussed in Section 6.5.3 since they were last sampled in October 2004.

The existing wells located on the North Plant Site and EJ&E property are listed on Table 6. Although they will each be inspected before any sampling activities, it is anticipated that the majority, if not all of them are suitable for sampling. However, samples will not be collected from wells that contain NAPL since it is understood that NAPL can be easily established as free-phase tar and analyses are not required to assess magnitude. In the event monitoring well BARR MW4/MW4D shows the presence of NAPL, the borings and wells on the railroad property will be relocated to the NSSD property to evaluate the extent of the NAPL. Existing well elevations will be re-surveyed when the new wells are surveyed so all elevation information is updated for future use.

6.5.2 Monitoring Well Installation

Groundwater monitoring well nests, consisting of a shallow well and piezometer, are tentatively proposed at locations shown on Figure 17 to address the following specific areas of the Site and surrounding area:

- Up to four well nests east of the EJ&E Railroad from north of Dahringer Road to south of Parcel 2 on EJ&E property to compliment data from existing wells, monitor groundwater quality, further define the lateral extent of DNAPL and MGP residuals that may be migrating to the east/southeast in the fill and sand unit.
- Up to three well nests west of Pershing Road to complement data from existing wells, monitor groundwater quality and further define the lateral extent of MGP residuals.
- One well nest north of Dahringer Road on the right-of-way to compliment data from existing wells, monitor groundwater quality and further define the lateral extent of MGP residuals.
- One well nest south on Parcel 2 and east of Parcel 3 to compliment data from existing wells MW-15S/D, monitor groundwater quality, and further define the lateral extent of MGP residuals to the south. An additional monitoring well may be necessary to further delineate the groundwater plume east of this area as discussed in Section 6.5.5.

The wells will be drilled using either hollow-stem auger or roto-sonic drilling methods, and soil samples will be collected from the same intervals as the other borings for laboratory analysis of soil COPCs. Well nests will be installed at all drilling locations to evaluate conditions both at the water table and near the base of the sand/fill material (at the top of the underlying clay). Groundwater monitoring wells will be installed in accordance with SOP SAS-05-03 and five-foot long well screens will be used for consistency with the existing Site wells.

Groundwater flow is generally east/southeast toward Lake Michigan as discussed in Section 3 (Figures 13 and 14). The silty clay unit underlying the sand unit is generally encountered at 18.5 to 29 feet bgs (Figures 9 and 10). The soil borings for the well nest locations are anticipated to be drilled to the top of the silty clay unit which is a confining layer at the Site. The wells will be constructed with 2-inch diameter stainless steel screen and riser materials. The water table wells will be installed to an average depth of 12 feet bgs with the top of the well screen above the water table (in the smear zone) to monitor water table impacts. The piezometers will be installed with the bottom of the well set at approximately 6 inches below the top of the clay surface in an attempt to monitor contaminant migration along the sand/clay interface. In general, the annulus around each screen will be backfilled with sand filter pack to 2 feet above the top of the screened interval and then sealed appropriately with either a hydrated bentonite or grout/concrete seal (SOP SAS-05-3).

Groundwater monitoring wells may either be completed with locking steel stick-up well covers or with flush mount covers (each of which will be set in a concrete pad). If completed as a stick-up well, the well will be completed approximately 3 feet above ground surface and three steel bumper posts will be installed around each nest to protect them from vehicles and mowing activities. This will not be necessary if the wells are completed with flush mount covers. None of the new wells will be installed on the secured portion of the Site, so protection will be necessary. Wells will be identified with an "S" for the water table well (shallow) and a "D" for the piezometer (deep). The wells are proposed to be drilled by hollow-stem auger methods. Drilling and well construction activities will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP (Integrys 2008).

Exact locations will be established following negotiation of access agreements with adjacent property owners. During drilling, soil samples will be collected to log lithology, determine the presence/absence of MGP residuals (especially free-product), for field screening to document subsurface conditions and possibly identify samples for laboratory analyses or geotechnical testing. Once the clay unit is encountered, the drilling will cease and the well nest will be installed. The number and location of the groundwater well nests may be modified as investigation work continues. Additional well nests may be recommended based on field observations at a given location.

All new and existing monitoring wells will be surveyed to determine the well location (x and y) as well as the ground surface and top of casing elevations (z).

6.5.3 Groundwater Monitoring Well Development and Sampling

The new monitoring wells will be developed in accordance with the bailing and pumping methods described in Section 4 of the Multi-Site FSP (Integrys 2008) and SOP SAS-05-04 following installation.

Low flow sampling will be performed using peristaltic pumps, since the depth to groundwater is not anticipated to be greater than 10 feet deep. If the depth to water is greater than 15 feet, the water column is greater than 2 feet and the well is not low yielding, a submersible pump will be used. A bailer will be used in low yielding wells with less than 2 feet of water column in the well.

Monitoring well development will continue until the field parameters stabilize and at least five well volumes of water have been removed from the well in accordance with SOP SAS-08-03. If liquids were introduced into the borehole during drilling and/or well construction activities, an additional volume of water equal to the amount added will be removed from the well.

Purge water from well development activities is anticipated to be sampled and disposed of at permitted offsite treatment facility. Approval will include compliance with the Off-Site Rule (40 CFR 300.440), as applicable.

6.5.4 Groundwater Level Measurements

Groundwater levels will be measured to assess the elevation and direction of groundwater flow whenever the monitoring wells are sampled, or as needed to assess flow conditions. Water level measurements will be collected from all the monitoring wells regardless of whether or not a particular location is being sampled.

Further, the measurements will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP (Integrys 2008) and SOP SAS-08-01. Observations regarding the presence and thickness of NAPL or MGP-residuals within a well will be recorded on the appropriate forms on which the water level measurements will be recorded. The usability of data from wells containing NAPL will be evaluated as groundwater contour maps are produced. Water level measurements will be collected in a round as quickly as possible. If the activities are not completed in 12 hours, additional time will be spent collecting the data as quickly as possible.

6.5.5 Sampling Schedule and Parameters

Continued groundwater sampling will be completed for the following reasons.

- To detect changes in environmental conditions (e.g., hydrogeologic, chemical, or other changes) that may result in an increased risk or exposure potential;
- To identify potentially mobile transformation products;
- To assess plume stability and groundwater concentration trends; and
- To detect new releases of constituents to the environment that could impact potential remedial action alternatives (e.g., Monitored Natural Attenuation (MNA), institutional controls, etc.).

Groundwater monitoring will be initiated on a quarterly basis (4 rounds) following the new well installation such that enough data is collected from the new wells and the existing wells before completing the RI Report. The proposed sampling locations are presented on Figure 17.

After the first round of groundwater results from all Site wells are received and reviewed, the overall plume delineation will be evaluated to determine whether additional groundwater characterization activities or additional monitoring wells are necessary to define the plume extent.

If the first round of data shows any wells with groundwater quality only slightly above standards, a second round of data will be collected and evaluated before additional wells are installed, in the event drilling artifacts may have influenced the first event samples.

The monitoring schedule will be reviewed and updated as necessary. Following quarterly RI sampling for one year, the groundwater monitoring schedule may change if approved by USEPA. Also after one year of quarterly sampling, certain wells and/or analytical parameters may be proposed to be deleted from the groundwater monitoring program, based on the data evaluation.

The RI Report will be submitted after four quarterly rounds of groundwater data are collected from the new and existing wells. This will provide sufficient information to assess whether supplemental RI activities are required. If supplemental RI activities are identified, the RI submittal date is subject to change to allow all RI data to be presented.

The tentative schedule for well installation and quarterly sampling is shown on Figure 18. Groundwater samples will be collected and analyzed for BTEX, PAHs, bis(2-ethylhexyl)phthalate, dibenzofuran, dissolved arsenic, dissolved chromium, and dissolved lead (Table 13). CVOCs cis-1,2-dichloroethene and vinyl chloride will be analyzed in the five well nests (10 samples) located on the north/northeast end of the site. Samples will be analyzed in a fixed-based laboratory as described in the Multi-Site QAPP (Integrys 2007b) and FSP (Integrys 2008). Groundwater sampling will be completed using peristaltic pump sampling methods (as previously performed) described in Section 4 of the Multi-Site FSP (Integrys 2008) and SOP SAS-08-02, to maintain consistency with previous sampling data. Additionally, USEPA sample identification protocol and sampling forms will be used to ensure that samples are tracked accordingly and that the laboratory analytical data is provided in a manner consistent with the USEPA database requirements. Field parameters will also be recorded during well purging, including pH, temperature, turbidity, dissolved oxygen (DO), oxidation/reduction potential (ORP), and conductivity.

6.5.6 Aquifer Characterization

Single well aquifer tests will be completed to characterize hydraulic conductivity at the new monitoring well locations only if the drilling observations indicate that the formation is different from the majority of the wells previously installed. Therefore, if the subsurface materials encountered at each well location(s)

are comprised primarily of fine to medium grained sand, no testing will be done. If appropriate, single well tests will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP (Integrys 2008) and SOP SAS-08-04.

The top of the clay unit was encountered at depths ranging from 18.5 to 29 feet bgs. The Illinois State Geological Survey (ISGS) indicates this unit is the Wadsworth Till, which ranges from 30 to 40 feet in thickness in the vicinity of Lake Michigan (*Geology for Planning in Lake County, Illinois* - Circular 481, ISGS, 1973). Drilling will extend 10 feet into the clay at two piezometer locations to confirm the anticipated low hydraulic conductivity of this unit. The hydraulic conductivity of intact samples will be completed through testing at a geotechnical laboratory.

6.5.7 Groundwater Monitoring Well Abandonment

If it is determined that any of the wells in the monitoring network require abandonment, these activities will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP (Integrys 2008). At this time, no well abandonment activities are planned.

6.5.8 On-Going Groundwater Monitoring

After four quarters of groundwater sampling, monitoring may change with potential modifications to the groundwater monitoring well network and/or parameter list. The revised groundwater monitoring schedule will be maintained until modifications are approved by USEPA.

The RI Report will provide a plan for continued groundwater monitoring between the timeframe of performing the RI and remedial action. Post-RI activities include continued groundwater monitoring and reporting and evaluating trends in groundwater quality. Identification of and the need for continuing Site activities will be discussed with USEPA representatives following completion of the RI work and report.

6.6 Pond Assessment

As discussed in Section 4.2.3 and 4.2.4, the Waukegan Tar Pit is approximately 0.3 to 0.4 acres in size and the sediment and surface water are considered potential media of concern. Based on the October 2011 evaluation, there appears to be a thin layer of soil (sediment) overlying the HDPE liner which is the bottom of the pond. The water depth at the center of the pond is approximately three to four feet deep. No fish or vegetation suitable for fish habitat has been observed in the pond during the November 2008 habitat assessment or the October 2011 evaluation. However, to further support not including fish in the CSM, an additional habitat assessment (using the format completed in Appendix D) will be performed in

the warm months when vegetation is growing and fish, if present, would be observed. If fish are observed, the site-specific CSM will be refined to include fish as a potential receptor.

6.6.1 Sediment Sampling

Up to three sediment samples will be collected from the former Waukegan Tar Pit if sediment is present on top of the liner. Proposed sediment sampling locations are shown on Figure 17. Sediment poling, as described in Appendix A of the Site-Specific FSP (Integrys 2008) and SOP SAS-07-01 will be used to measure the thickness of soft sediment, although a plate will be attached to the bottom of the pole and used gently to ensure that the pond liner is not punctured. Sediment samples will be collected and analyzed to support a potential ecological screening or human health risk assessment. Three discrete surface (0 to 6-inches or less) sediment samples will be collected at separate locations. As mentioned in Section 4.2.3, the solids present on the pond liner appear to be from air-borne deposition, and recent observations suggest they have little cohesion. Based on these conditions, sampling will be attempted first with a core tube and then with a Ponar™ sampler. If the liquid content is too great (i.e. the water just drains from the tube when pulled above the water surface) then sample collection will be attempted with the Ponar. If more than 50% (by weight) of the sample is liquid, then the samples will be analyzed as water samples rather than solids samples. If this condition exists, then the water samples discussed below (Section 6.6) will be collected from the upper 20 percent of the water column depth for comparison with samples collected immediately above the pond liner.

The thickness of soft sediment will be recorded on field forms as discussed in Section 4 of the FSP (Integrys 2008) and SOP SAS-01-01 and SOP SAS-07-01. Constituents to be analyzed will include BTEX, cis-1,2-dichloroethene, vinyl chloride, PAHs, dibenzofuran, antimony, arsenic, copper, lead, mercury, and zinc. If the collected samples are analyzed as solids, then a composite sample comprising material from all three locations will be analyzed for physical parameters including carbon black, TOC, grain size, and percent solids (Table 13). All of the activities will be completed in accordance with the methods described in Section 4 of the Multi-Site FSP (Integrys 2008) and SOP SAS-07-03. Sediment collected will also be visually classified consistent with SOP SAS-05-02 and SOP SAS-07-02.

6.6.2 Surface Water Sampling

Three surface water samples will be collected from the water present on the Waukegan Tar Pit liner. Samples will be collected from the same locations as the sediment samples (Figure 17); as mentioned above (Section 6.6.1), these samples will be collected from the upper 20 percent of the water column at

each location if the liquid content of the sediment samples is so great that they are analyzed as water samples.

The samples will be collected using the Direct Grab Sampling or Sampling with an Intermediate Vessel or Container methods, Multi-Site FSP (Integrys 2008) and Sections 5.3.1 and 5.3.2, respectively (SOP SAS-09-01). Surface water COPCs are the same as groundwater COPCs. Field parameters will be measured during sampling and include temperature, pH, specific conductivity, turbidity, DO, and ORP.

6.7 Soil Vapor Intrusion (VI) Sampling

6.7.1 Sample Point Evaluation

Presently, there are five initial soil gas (VI) points planned for the site (Figure 17). The locations were selected based on affected soil or groundwater or the location of former MGP structures. However, the VI exposure pathway will be re-evaluated after additional soil and groundwater (at least one sample from all new and existing wells) data is collected, and the extent of impacts is delineated further. Re-evaluation of the VI sampling locations will include the following:

- Identify buildings located within the critical distance of impacted soil or groundwater, which are 35 and 100 feet for non-chlorinated VOCs and CVOCs, respectively. Impacted soil refers to soil that contains visible evidence of impacts or detected COPCs (e.g. NAPL). Impacted groundwater refers to groundwater with COPC concentrations that exceed residential screening levels for vapor intrusion (cancer risk $1x10^{-6}$).

- Select and implement a sampling approach to evaluate the VI potential at any building located within the critical distance of impacted soil or groundwater.

- Exterior soil gas samples will be collected around the perimeter of buildings identified within the critical distance of impacted soil or groundwater. Samples will be analyzed for the soil gas COPCs (Section 3.7). Results will be compared to the shallow soil gas screening level for residential land use (cancer risk 10^{-6}). If results exceed the screening levels, and the building is currently occupied, the assessment will proceed with subslab sampling in the building (see below).

- Subslab vapor samples will be collected beneath buildings located over MGP-related residuals (e.g. soil or groundwater containing MGP soil gas COPCs). Samples will be analyzed for the soil gas COPCs (Section 3.7). Results will be compared to the shallow soil gas screening level for residential land use (cancer risk 10^{-6}). If results exceed the screening levels, further assessment will be considered and an approach developed.

- Identify the areal extent of property that requires VI risk evaluation for future construction or use scenarios at locations where the upper range of site soil and groundwater impacts are likely present (e.g. soil or groundwater with MGP residuals that are known to have sufficient volatility to exhibit a potential exposure concern). This area will include land located within the critical distance of impacted soil or groundwater.

- Collect samples at a density of approximately one sample for every 3.5 acres of land to be analyzed for the soil gas COPCs (Section 3.7). Results will be compared to the shallow soil gas screening level for residential land use (cancer risk 10^{-6}). Soil gas results will be used to evaluate VI risk in the Remedial Investigation (RI) Report.

- Identify utility corridors that traverse impacted areas of the Site (within the critical distance of impacted soil or groundwater). Larger diameter utility corridors and utility corridors that traverse significantly impacted areas of the site will be selected for soil gas sampling. Collect samples within the utility corridor bedding material. Samples will be analyzed for the soil gas COPCs (Section 3.7). Results will be compared to the shallow soil gas screening level for residential land use (cancer risk 10^{-6}). If results exceed the screening levels, further assessment will be considered.

6.7.2 Soil Gas Sampling Method

At each proposed exterior soil gas sampling location, at least two nested probes will be installed. One probe will be installed in the soil column directly (approximately one foot) above the water table. This will provide an estimate of volatilization at the water table. The other probe will be installed no shallower than 3 feet bgs. This will provide an estimate of soil vapor concentrations in shallow soil. Installing nested probes at multiple depths will allow evaluation of vertical attenuation over distance. Soil gas probes nests will be identified as WNP-SG#A (shallow) and WNP-SG#B (deep).

Soil gas samples will be collected in accordance with SOPs SAS-11-01 and SAS-11-06 from the Multi-Site FSP. For the deeper soil gas sampling locations, a direct-push rig will advance a probe hole through the soil, and soil samples may be collected during probe advancement. One or more soil vapor probes will then be advanced to the desired depth within the probe hole.

After the probe is driven to the desired depth, a filter pack containing sand will be set to within 2 inches above and below the vapor probe. Above the filter pack, cement-bentonite grout or granular bentonite will be placed up to the ground surface. If granular bentonite is used above the filter pack, the granular bentonite will be hydrated in two foot (2-ft) lifts up to ground surface. This bentonite will provide an airtight seal between the soil gas probe and the ambient air. A vault and well cover will be installed to make the probe locations more permanent. Probes will not be installed shallower than 3 feet bgs. Each probe will be allowed to set for at least 24 hours before sample collection.

Sampling will begin once probe assembly at each location is complete and the 24 hour waiting period has passed. Sample location information, and meteorological conditions (e.g., temperature, barometric pressure, wind speed/direction, and relative humidity) will be recorded on a Field Data Air Sampling Form. Meteorological data will be obtained online from the nearest National Weather Service monitoring station. Digital photos will be taken of each sample location and sample assembly.

The sample canister valve will then be opened to begin sample collection. The start time and initial vacuum when sample collection starts will be recorded on the Field Data Air Sampling Form. The laboratory-provided flow regulators will be calibrated for a 5 to 10 minute sample duration, which correlates to a flow rate of 100 to 200 mL/min. The sample canister valve will be closed when the vacuum gauge indicates approximately 5 inches Hg (mercury) of vacuum remains in the canister. Sample collection should take approximately 5 minutes for a 1-liter Summa™ canister connected to a 200-mL/min flow regulator. The time sample collection stops and the final vacuum will be recorded on a Soil Vapor Sampling Field Form contained in the SOP. The flow regulator/particulate filter and vacuum gauge assembly will be removed and the laboratory-supplied brass plug on the canister will be replaced. The sample tubing assembly will be disconnected and the plug on the soil vapor probe will be replaced.

The sample canister will be labeled and the sample name, date and time of collection, the canister and flow controller serial numbers, and the final vacuum gauge reading will be recorded on the chain-of-custody. Samples will not be chilled or subjected to extreme temperature or pressure fluctuations. Samples will be shipped for analysis of soil gas COPCs (Table 13) by USEPA Method TO-15, and for O_2, CO_2, and methane by ASTM Method 1946 or USEPA Method 3C.

6.8 Disposal of Investigation-Derived Waste

Investigative wastes will be containerized during Site investigation activities prior to disposal offsite. Natural Resource Technology will ensure that facilities listed below meet the requirements of the “Off-Site Rule (OSR)” (USEPA September 1993) for the disposal of investigation-derived waste prior to undertaking any disposal activities. If any of these facilities do not meet the OSR requirements, USEPA will be informed and appropriate facilities will be identified.

During the 2003 removal action, solid wastes were disposed through Waste Management Inc.’s Countryside Subtitle D Landfill in Grayslake, Illinois. Therefore, soil generated during well/boring installation activities may be disposed at this facility based on the historic use of this facility for solid waste disposal purposes. Because the soil data from the Site was collected in 2003, the landfill may require that new waste characterization samples be collected. In that case, a composite sample of soil will be

prepared for waste characterization by collecting representative material from soil cuttings. The composite sample will be sent to a fixed-based analytical laboratory for analysis of waste disposal parameters that will be specified by the receiving facility as presented in Table 13.

Groundwater and decontamination water may be disposed at an offsite permitted facility. All disposal activities will be completed in accordance with applicable state and federal regulations and the methods described in Section 9 of the Multi-Site FSP (Integrys 2008). Representative samples for disposal purposes will be obtained and provided as required by the disposal authority through which the wastes will be managed and disposed.

6.9 Record Keeping

Details of field and laboratory records and data management and storage are provided in the Multi-Site QAPP (Integrys 2007b) and FSP (Integrys 2008) and SOP SAS-01-02.

6.10 Sample Analysis and Validation

Pace Analytical Services, Inc. (Pace) and STAT Analysis Corporation (STAT) are the proposed laboratories for chemical and geotechnical analysis of RI samples. Pace and STAT are identified in the USEPA –approved Multi-Site QAPP. Laboratory reporting limits (RLs) and detection limits (DLs) have been included in the appropriate laboratory's Quality Assurance Manual and laboratory SOPs in the Multi-Site QAPP to ensure that the Practical Quantitation Limits (PQLs) are met.

Table 13 summarizes the proposed Sampling and Analysis Plan for the North Plant Site and includes samples to satisfy quality assurance/quality control (QA/QC) requirements in accordance with Section 2 of the Multi-Site QAPP (Integrys 2007b) and SOP SAS-04-03. As described above, the dynamic work plan approach will be used and additional samples (including QA/QC samples) may be collected.

Laboratory procedures, field measurements and sample results will be verified and/or validated as discussed in the Multi-Site QAPP (Section 4) (Integrys 2007b).

6.11 Data Evaluation and Tabulation for Risk Assessment

Verified and/or validated data will be entered into Natural Resource Technology's database and tabulated for use as described in the Multi-Site QAPP (Integrys 2007b). Details of the procedures for assessing the precision, accuracy, representativeness, completeness and comparability of field data and analytical laboratory data are described in Section 4 of the Multi-Site QAPP (Integrys 2007b) and SOP SAS-04-01,

SOP SAS-04-02, and SOP SAS-04-03. The data will be evaluated to assess if the DQOs identified in the Multi-Site QAPP (Integrys 2007b) have been met.

Analytical results will be organized in a logical manner such as by sample location number, sample type or sample area. Analytical tables will indicate the unique sample identification number corresponding to the sample/location/well name, sampling date and time, sample depth, detection limits, analytical results (following the units of measurement presented in the Multi-Site QAPP Table 9 (Integrys 2007b) and validation qualifiers, if appropriate). Data may be presented in summary tables, graphs, and as plan view and/or cross-sectional views with COPC concentrations, as determined necessary.

Data sets may be created for each medium and may include summary statistics (detection frequency, arithmetic mean concentration, maximum detected concentration, standard deviation, and 95% upper confidence limit of the mean (UCL).

7 REMEDIAL INVESTIGATION REPORT

An RI Report will be prepared in general accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA* (USEPA 1988) (the RI/FS Guidance Document) at the conclusion of the investigation activities. This report will include the following information and documentation, as appropriate, in accordance with Task 4 of the SOW attached to the AOC:

- A description of the field procedures and methods used during the RI;
- A discussion of the nature and rationale for any significant variances from the scope of work described in this RI/FS SSWP;
- The data obtained during the RI and previously collected data considered to be of useable quality. This will include analytical data, field measurements, etc. To the extent practicable, RI and previously collected data will be presented in figures and tabular formats;
- The results of an assessment to evaluate if the RI acceptance/performance criteria, as specified in the Site-Specific QAPP, were met;
- The methods and rationales used in evaluating RI and previously collected data;
- Conclusions regarding extent and nature of MGP residuals in the various media being investigated;
- A revised Site-Specific CSM with a discussion of environmental fate and transport of COPCs;
- Baseline Risk Assessment Report, as discussed in the Multi-Site RAF;
- Discussion of anticipated future land use and reuse assessment; and
- Supporting materials for RI data. These will include boring logs, monitoring well construction diagrams, groundwater sampling logs, laboratory analytical reports, and similar information.

8 FEASIBILITY STUDY SCOPE OF WORK

This section identifies the approach to the FS for the former North Plant MGP Site. The FS will be completed in accordance with the guidelines presented in the RI/FS Guidance Document (USEPA, 1988). Additional guidance may be identified as part of future discussions with USEPA during scoping meetings to prepare the Multi-Site FS Memorandum and Documents included in the SOW.

Multi-Site FS Documents to be prepared include:

- Preliminary Remedial Technology Screening (SOW Task 1.2.2.1);
- Preliminary List of Possible ARARs (SOW Task 1.2.2.2); and
- Preliminary Permitting/Equivalency Requirements (SOW Task 1.2.2.3).

8.1 Development and Screening of Alternatives

Task 6 of the SOW requires a range of site-specific remedial alternatives be developed and screened for evaluation in the FS. The site-specific remedial alternatives will build on the Multi-Site FS Documents. A Site-Specific Alternatives Screening Technical Memorandum will be prepared to summarize the site-specific alternative array analysis. The memorandum will document the methods, the rationale and the results of the alternatives screening process and will include the following elements:

8.1.1 Development and Remedial Action Objectives

Remedial action objectives (RAO) will be developed based on the results of the human health and ecological risk assessments. Prior to developing these objectives, the contaminants and media of concern, potential pathways, and contaminant level or ranges that are protective of human health and environment will be specified. The remedial response objectives that may be developed will focus on eliminating or minimizing substantial risks to human health and the environment.

8.1.2 Identify Areas of Volumes of Media

The areas and/or volumes of media in which response actions may apply will be delineated and will consider the requirements for protectiveness as identified in the RAO. These areas and/or volumes of media addressed will form the foundation for developing and screening remedial technologies.

8.1.3 Identify, Screen, and Document Remedial Technologies

Applicable technologies will be identified and evaluated to eliminate technologies that cannot be implemented at the Site. This screening will be accomplished by evaluating alternatives on the basis of effectiveness, implementability, and cost as described below:

- **Effectiveness Evaluation** – The effectiveness evaluation will consider the capability of each remedial alternative to protect human health and the environment. Each alternative will be evaluated as to the protection it would provide and the reductions in toxicity, mobility or volume of COPCs it would achieve.

- **Implementability Evaluation** – The implementability evaluation will be used to measure both the technical and administrative feasibility of constructing, operating and maintaining a remedial action alternative. In addition, the availability of the technologies involved in a remedial alternative will be considered. Innovative technologies will be considered throughout the screening process if there is a reasonable belief that they offer potential for better treatment performance or implementability, few or lesser adverse impacts than other available approaches, or lower costs than demonstrated technologies.

- **Cost Evaluation** – The cost evaluation will include estimates of capital costs, annual operation and maintenance (O&M) cost, and present worth analyses. These conceptual cost estimates are order-of-magnitude estimates, and will be prepared based on preliminary conceptual engineering for major construction components and unit costs of capital investment and general O&M costs available from USEPA guidance documents or past experience with similar systems/projects.

8.1.4 Assemble and Document Alternatives

A draft remedial alternatives screening memorandum for the FS will be prepared that will document the preliminary FS work tasks described above and will address each affected media or operable unit. A draft memorandum will be submitted to USEPA for review and comment, summarizing the results of the preliminary screening. The list of potential remedial alternatives developed above will initially undergo preliminary screening to reduce the number of technologies and alternatives for future analysis while preserving a range of options, if necessary. In addition, the ARARs associated with each of the assembled alternatives will be summarized.

8.2 Detailed Analysis of Alternatives

Task 7 of the SOW requires a detailed analysis of remedial alternatives be presented to USEPA for use in selecting the Site remedy. This analysis will use the Multi-Site FS documents as the framework.
The remedial alternatives and associated institutional controls that pass the initial screening will be further evaluated against nine criteria as set forth in 40 C.F.R. § 300.430(e)(9)(iii).

These nine criteria include:

- **Overall Protection of Human Health and the Environment** – Alternatives shall be assessed to determine whether they can adequately protect human health and the environment, in both the short- and long-term, from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the site by eliminating, reducing, or controlling exposures to levels established during development of remediation goals consistent with 40 CFR 300.430(e)(2)(i). Overall protection of human health and the environment draws on the assessments of other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

- **Compliance with ARARs** – The alternatives shall be assessed to determine whether they attain applicable or relevant and appropriate requirements (ARARs) under federal environmental laws and state environmental or facility citing laws or provide grounds for invoking one of the waivers under paragraph (f)(1)(ii)(C) of this section.

- **Long-Term Effectiveness and Permanence** – Alternatives shall be assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the alternative will prove successful. Factors that shall be considered, as appropriate, include the following: Magnitude of residual risk remaining from untreated waste or treatment residuals remaining at the conclusion of the remedial activities; and Adequacy and reliability of controls such as containment systems and institutional controls that are necessary to manage treatment residuals and untreated waste.

- **Reduction of Toxicity, Mobility and Volume through Treatment** – The degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume shall be assessed, including how treatment is used to address the principal threats posed by the site. Factors that shall be considered, as appropriate, include the following: The treatment or recycling processes the alternatives employ and materials they will treat; The amount of hazardous substances, pollutants, or contaminants that will be destroyed, treated, or recycled; The degree of expected reduction in toxicity, mobility, or volume of the waste due to treatment or recycling and the specification of which reduction(s) are occurring; The degree to which the treatment is irreversible; The type and quantity of residuals that will remain following treatment, considering the persistence, toxicity, mobility, and propensity to bioaccumulate of such hazardous substances and their constituents; and The degree to which treatment reduces the inherent hazards posed by principal threats at the site

- **Short-Term Effectiveness** – The short-term impacts of alternatives shall be assessed considering the following: Short-term risks that might be posed to the community during implementation of an alternative; Potential impacts on workers during remedial action and the effectiveness and reliability of protective measures; Potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation; and Time until protection is achieved

- **Implementability** – The ease or difficulty of implementing the alternatives shall be assessed by considering the following types of factors as appropriate: Technical feasibility, including technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional remedial actions, and the ability to monitor the effectiveness of the remedy; Administrative feasibility, including activities needed to coordinate with other offices and agencies and the ability and time required to obtain any necessary approvals and permits from other agencies (for off-site actions); and, Availability of services and materials, including the availability of adequate

off-site treatment, storage capacity, and disposal capacity and services; the availability of necessary equipment and specialists, and provisions to ensure any necessary additional resources; the availability of services and materials; and availability of prospective technologies.

- **Cost** – The types of costs that shall be assessed include the following: Capital costs, including both direct and indirect costs; Annual operation and maintenance costs; and Net present value of capital and O&M costs.

- **State Acceptance** – Assessment of Illinois EPA concerns may not be completed until comments on the RI/FS are received but may be discussed, to the extent possible, in the proposed plan issued for public comment. The Illinois EPA concerns that shall be assessed include the following: The Illinois EPA's position and key concerns related to the preferred alternative and other alternatives; and Illinois EPA comments on ARARs or the proposed use of waivers.

- **Community Acceptance** – This assessment includes determining which components of the alternatives interested persons in the community support, have reservations about, or oppose. This assessment may not be completed until comments on the proposed plan are received.

8.2.1 Compare Alternatives Against Each Other and Document the Comparison of Alternatives

After the remedial alternatives have been assessed against the evaluation criteria, a comparative analysis will be performed. This analysis will compare all of the remedial alternatives against each other for each criterion. USEPA will identify and select the preferred alternative.

8.3 FS Report

A Draft FS Report will be prepared to summarize the activities performed and to present the results and associated conclusions for the tasks performed. The report will include a summary of the initial screening study process and present the detailed analysis of remedial alternatives considered as basis for developing a Record of Decision (ROD).

It is anticipated, the FS Report will contain the following sections:

- Introduction and Site Background
- Development of RAOs and General Response Actions
- Identification and Screening of Remedial Technologies
- Development and Initial Screening of Remedial Alternatives

- Detailed Analysis of Alternatives
- Comparative Analysis of Alternatives
- Summary

The feasible technology options for Site remediation, if warranted, will be identified for each general response action, and the results of the remedial technologies screening will be described. Remedial alternatives will be developed by combining the technologies identified in the previous screening process. The results of the initial screening of remedial alternatives, with respect to effectiveness, implementability and cost will be described. Final screening against the nine comparative criteria and the comparison of remedial alternatives will be presented with a final recommended remedial alternative. A description of the key requirements for alternative implementation and estimated time frame for construction of the final recommended alternative will also be presented in the summary and conclusions section of the report.

9 SCHEDULE

Figure 18 presents a preliminary project schedule showing the overall progress of the work for the major tasks to be performed in support of the former North Plant MGP RI/FS. Due to the seasonally-dependent sampling events, the overall schedule is dependent on USEPA approvals.

Assumptions on which the preliminary schedule is based include the following:

- Four rounds of quarterly groundwater samples will be collect from new and existing wells for the RI activities and reporting;
- The number and locations of wells in the monitoring network, the parameters, and sampling frequency will be reviewed after one year of quarterly groundwater monitoring;
- Supplemental groundwater and vapor intrusion assessment is not required;
- The need for treatability testing (which is not included at this time) will be assessed and the schedule will be modified if the need for a treatability study(s) is identified;
- Subcontractors are available when needed to keep site work moving forward; and
- Site access is provided by the necessary property owners and does not cause a delay.

Following approval of the SSWP, a more detailed or revised schedule may be submitted to USEPA with the first monthly progress report, at least 15 days following approval of the SSWP.

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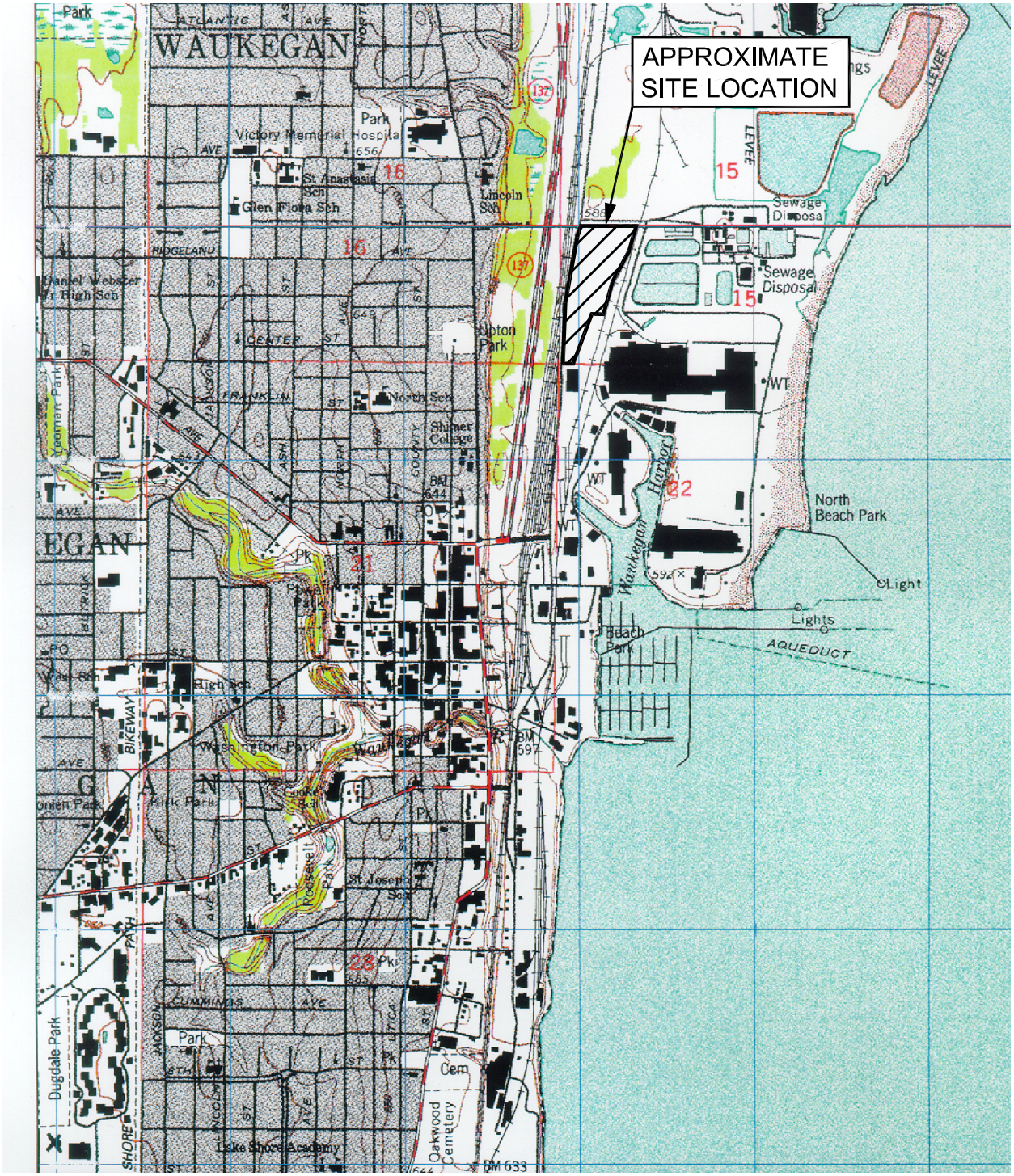
FIGURES



N

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS–McDONNELL DIGITAL FILE:
FIGURE 1 SITE LOCATION.DWG

0 2000' 4000'
APPROXIMATE SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY

SITE LOCATION MAP

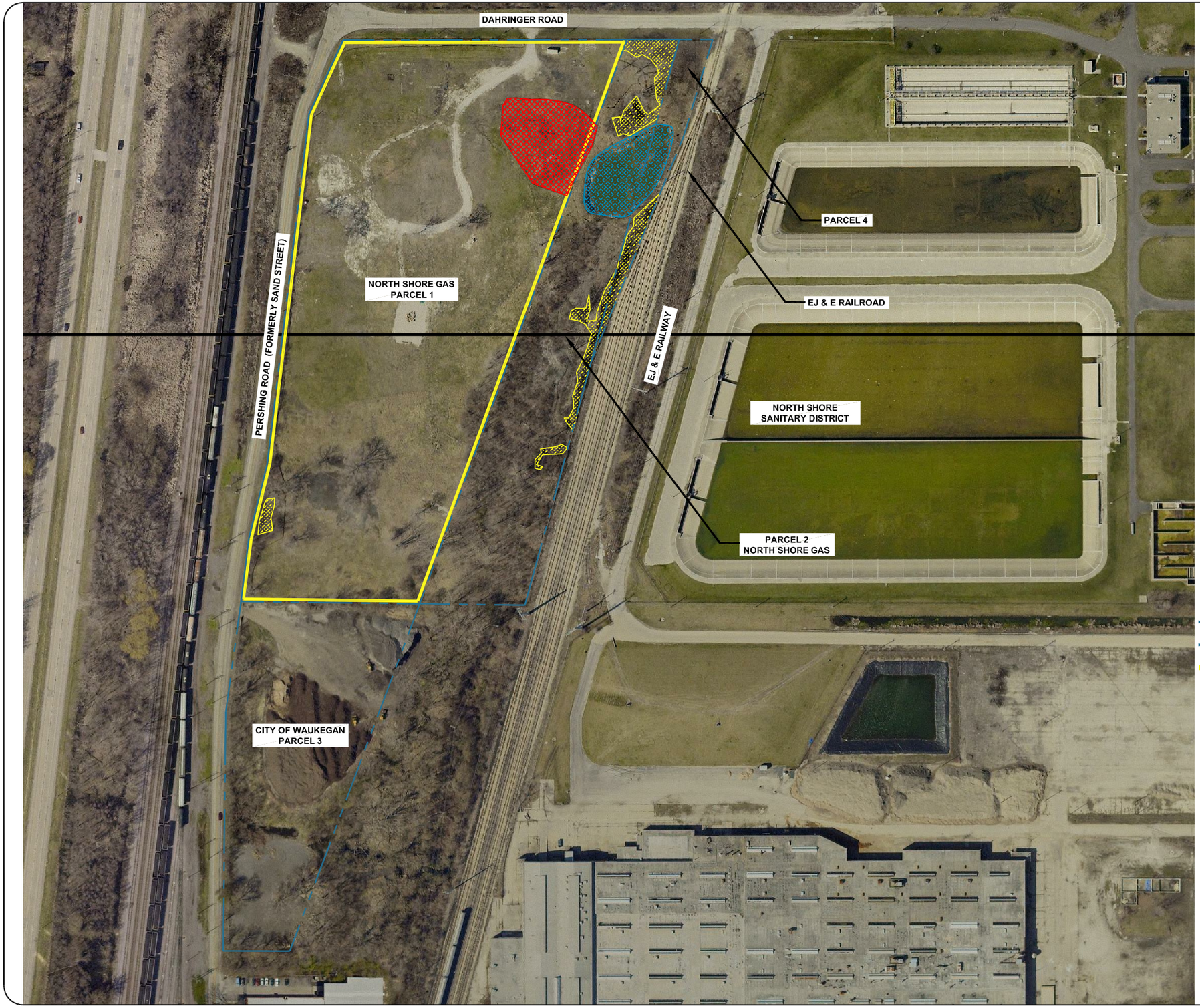
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

PROJECT NO.
1986/2.0

DRAWING NO.
1986–A02C

FIGURE NO.
1

DRAWN: SJD 6/22/11 CHK'D: EPK APP'D: EPK DATE: 6/28/11



LEGEND

- PROPERTY LINE
- PARCEL LINE
- FORMER MGP BOUNDARY
- PONDED WATER (FORMER TAR PIT)
- WETLAND
- TAR AT SURFACE

N

0 100' 200'
SCALE IN FEET

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS–McDONNELL DIGITAL FILES DATED 12–04–08:
FIG 2 SITE LAYOUT.DWG, Base50b.DWG, Base50D.DWG, Base50F.DWG, Borings.DWG, HISTORICAL.DWG, npintlay.DWG, UTILITIES.DWG, WETLAND–POND PLAT.DWG

CURRENT SITE LAYOUT

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

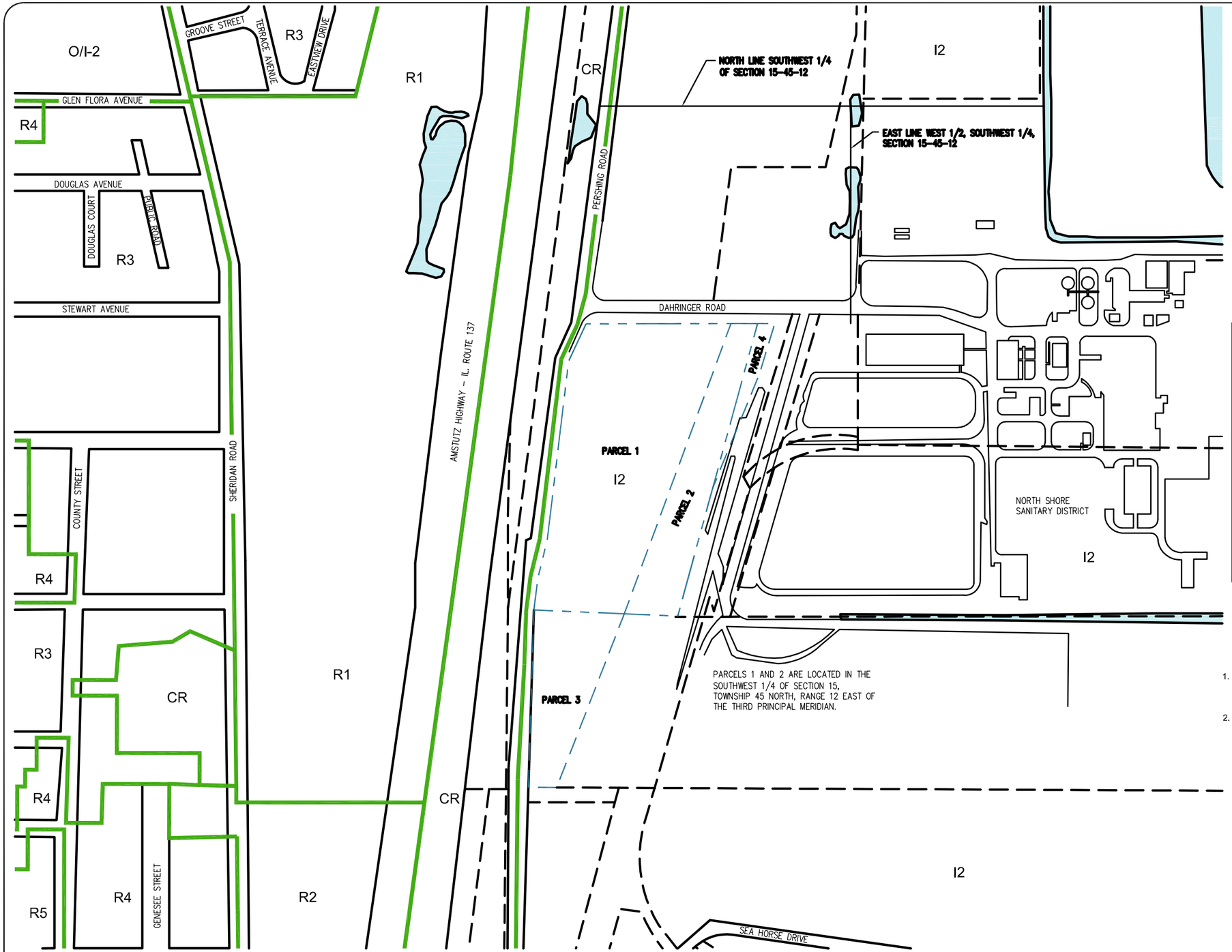
DRAWN BY:	SJD	DATE: 6/22/11
CHECKED BY:	EPK	DATE: 6/22/11
APPROVED BY:	EPK	DATE: 06/28/11

DRAWING NO:1986–2–B02C
REFERENCE:.

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
2



LEGEND

CR, R3	ZONING CODES
	ZONING BORDERS
	SITE LOCATION
	PARCEL LINE
	ADJACENT PROPERTIES
	WATER BODIES

ZONING DISTRICTS

CR	CONSERVATION/RECREATION
I2	GENERAL INDUSTRIAL
O/I-2	OFFICE/INSTITUTIONAL
R1	SINGLE-FAMILY RESIDENCE
R2	SINGLE-FAMILY RESIDENCE
R3	SINGLE-FAMILY RESIDENCE
R4	TWO-FAMILY RESIDENCE
R5	LIMITED GENERAL RESIDENCE

NOTES:

1. ZONING INFORMATION OBTAINED FROM MAY 2007 CITY OF WAUKEGAN ZONING DISTRICT MAP AT: WWW.WAUKEGANWEB.NET IN NOVEMBER, 2008.
2. ALL OF THE LAND EAST OF PERSHING ROAD IS ZONED I2 - GENERAL INDUSTRIAL.

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS-McDONNELL DIGITAL FILE DATED 10-21-05:
FIG 14 SURROUNDING AREA.DWG

DRAWN BY: SJD DATE: 6/22/11
CHECKED BY: EPK DATE: 6/22/11
APPROVED BY: EPK DATE: 06/28/11
DRAWING NO: 1986-2-B03C
REFERENCE:.

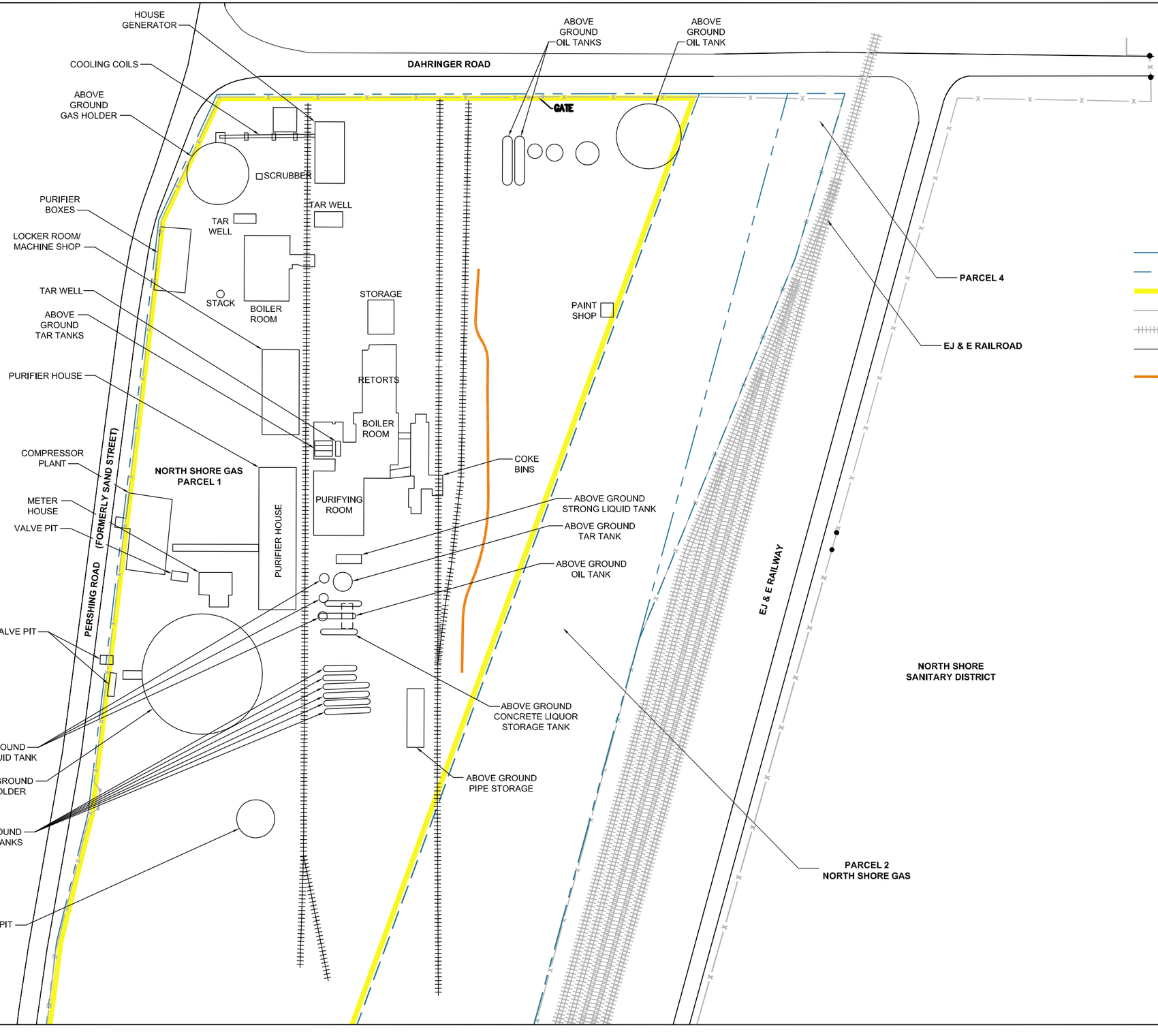
SITE AND SURROUNDING AREA ZONING

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
3



NOTES:

LOCATIONS OF HISTORICAL STRUCTURES WERE TAKEN FROM HISTORIC SANBORNS AND AERIAL PHOTOS.

THE HISTORIC DITCH WAS APPROXIMATED FROM THE 1958 & 1964 AERIAL PHOTOGRAPHY.

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS–McDONNELL DIGITAL FILES DATED 12–04–08:
FIG 4 HISTORICAL SITE LAYOUT.DWG, Base50b.DWG, Base50D.DWG, Base50F.DWG, Borings.DWG, HISTORICAL.DWG, nplntlay.DWG

DRAWN BY: SJD	CHECKED BY: EPK	APPROVED BY: EPK
DATE: 11/17/11	DATE: 11/17/11	DATE: 11/17/11

DRAWING NO:1986–2–B04C
REFERENCE:.

HISTORICAL SITE LAYOUT

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
4

LEGEND

- PROPERTY LINE
- PARCEL LINE
- RAILROAD TRACKS
- HISTORICAL STRUCTURES
- WATER MAIN
- SANITARY SEWER
- GAS
- MANHOLE
- PONDED WATER (FORMER TAR PIT)
- WETLAND

NOTE:
UTILITIES PRESENTED ARE BASED ON:
NSSD DIVISION S-6A FIGURES, SEPTEMBER 1971;
NSSD DIVISION S-5A FIGURES, MARCH 1973;
NSSD DIVISION F-3 FIGURES, FEBRUARY 1975;
NSG FIGURE 4512 - 153A, APRIL 1994.

N

0 60' 120'
SCALE IN FEET

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS-McDONNELL DIGITAL FILES DATED 12-04-08:
FIG 5 UTILITY MAP.DWG, Base50b.DWG, Base50D.DWG, Base50F.DWG, Borings.DWG, HISTORICAL.DWG, npintloy.DWG, UTILITIES.DWG, WETLAND-POND PLAT.DWG

DRAWN BY: SJD DATE: 6/22/11
CHECKED BY: EPK DATE: 6/22/11
APPROVED BY: EPK DATE: 6/28/11
DRAWING NO:1986-2-B05C
REFERENCE:.

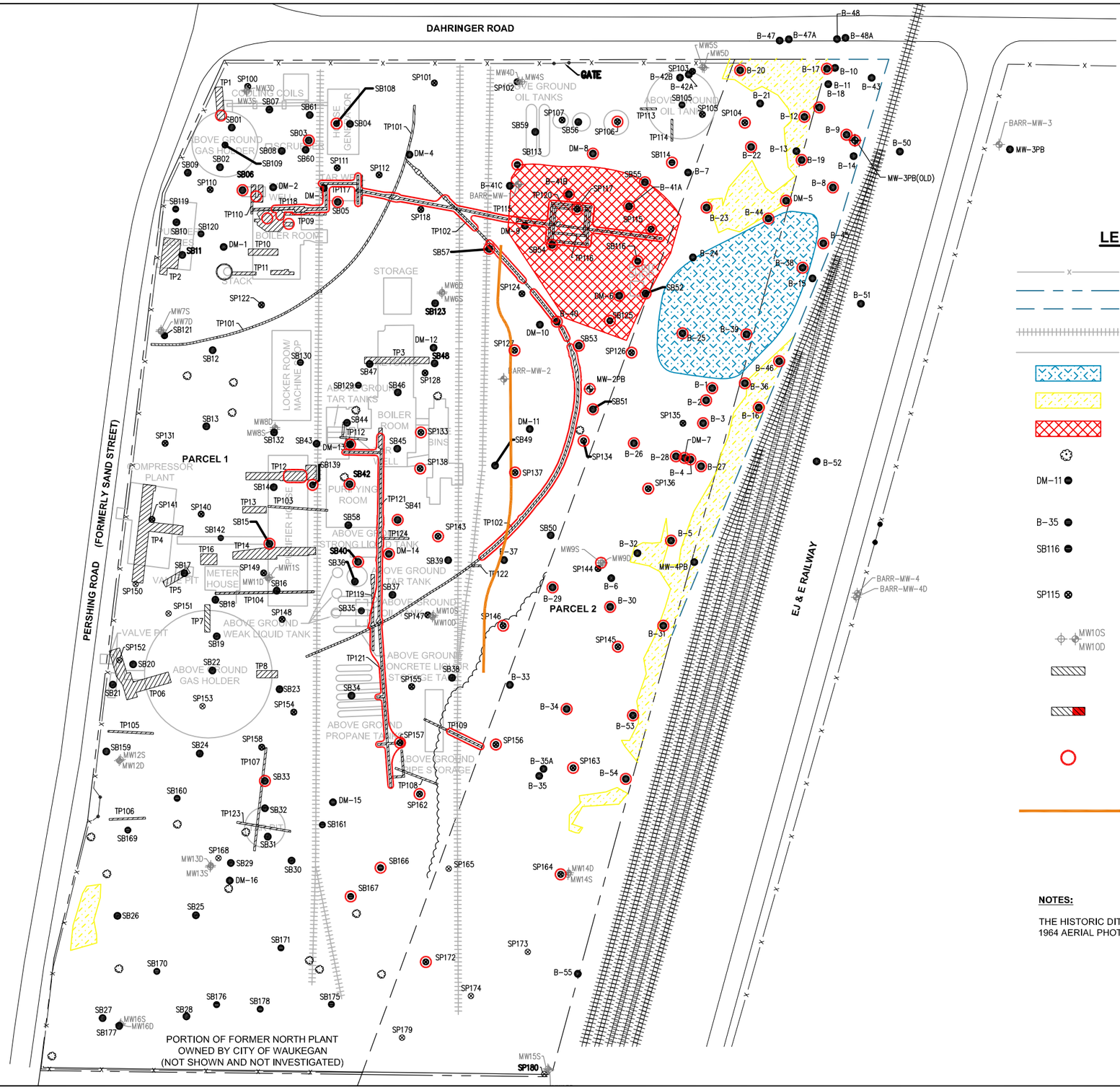
EXISTING BELOW GRADE UTILITY MAP

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
5



LEGEND

- FENCE
- PROPERTY LINE
- PARCEL LINE
- RAILROAD TRACKS
- HISTORICAL STRUCTURES
- PONDED WATER (FORMER TAR PIT)
- WETLAND
- TAR AT SURFACE
- EXISTING TREE
- DM-11 ● SOIL BORING LOCATION INSTALLED BY DAMES & MOORE
- B-35 ● SOIL BORING LOCATION INSTALLED BY BARR
- SB116 ● SOIL BORING LOCATION INSTALLED BY BURNS & MCDONNELL
- SP115 ⊗ SOIL PROBE LOCATION INSTALLED BY BURNS & MCDONNELL
- MW10S / MW10D GROUNDWATER MONITORING WELL
- TEST PIT LOCATION
- TAR VISUALLY IDENTIFIED OR SAMPLE EXCEEDS CSAT OR ATTENUATION CAPACITY
- TAR VISUALLY IDENTIFIED OR SAMPLE EXCEEDS CSAT OR ATTENUATION CAPACITY
- HISTORIC DITCH LOCATION

NOTES:

THE HISTORIC DITCH WAS APPROXIMATED FROM THE 1958 & 1964 AERIAL PHOTOGRAPHY.

N

0 60' 120'
SCALE IN FEET

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS-McDONNELL DIGITAL FILES DATED 12-04-08:
FIG 6 SAMPLE LOCATION MAP.DWG, Base50b.DWG, Base50F.DWG, Borings.DWG, HISTORICAL.DWG, nplntlay.DWG, UTILITIES.DWG, WETLAND-POND PLAT.DWG, ALL SAMPLES-REGULAR SCALE.DWG

DRAWN BY: SJD DATE: 11/17/11
CHECKED BY: EPK DATE: 11/17/11
APPROVED BY: EPK DATE: 11/17/11
DRAWING NO:1986-2-B06C
REFERENCE:.

SOIL BORING/PROBE LOCATIONS

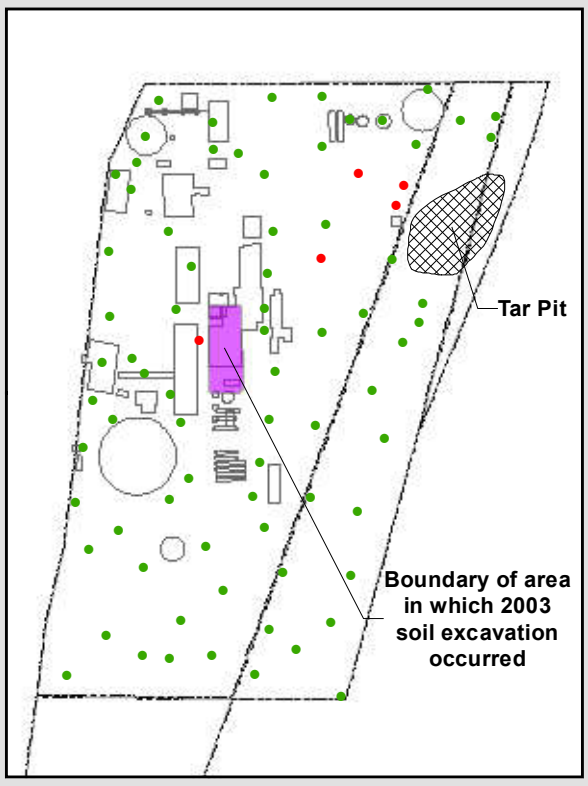
SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

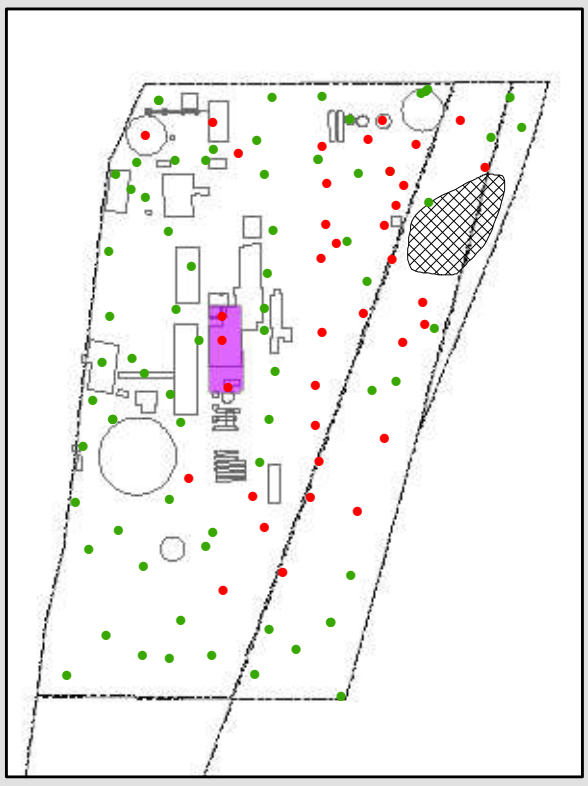
PROJECT NO.
1986/2.0

FIGURE NO.
6

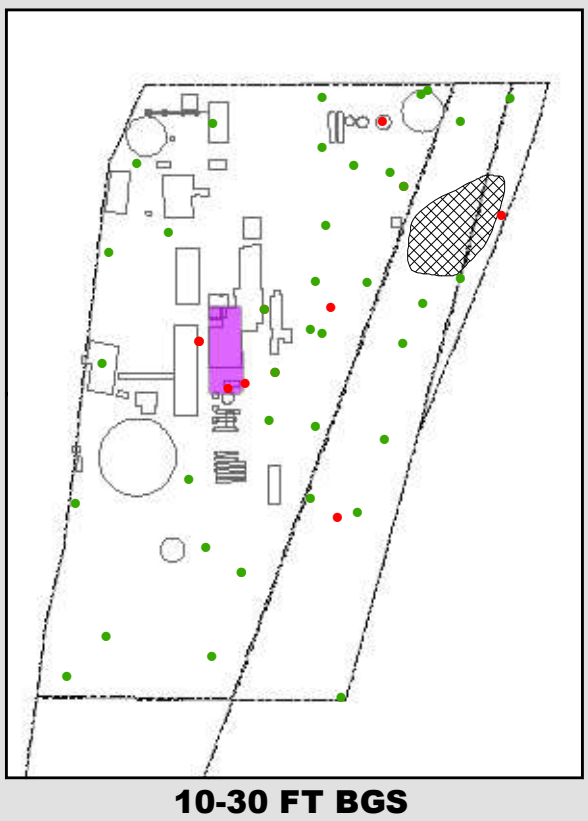
BENZENE



0-3 FT BGS

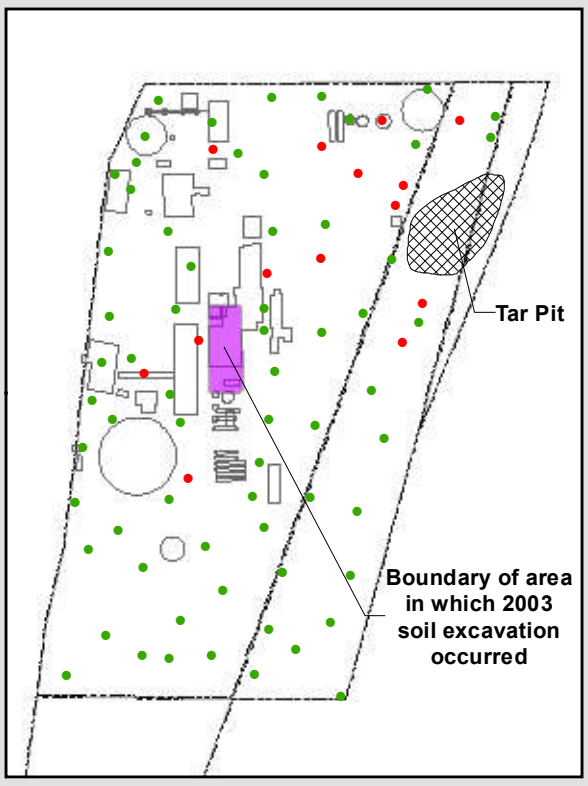


3-10 FT BGS

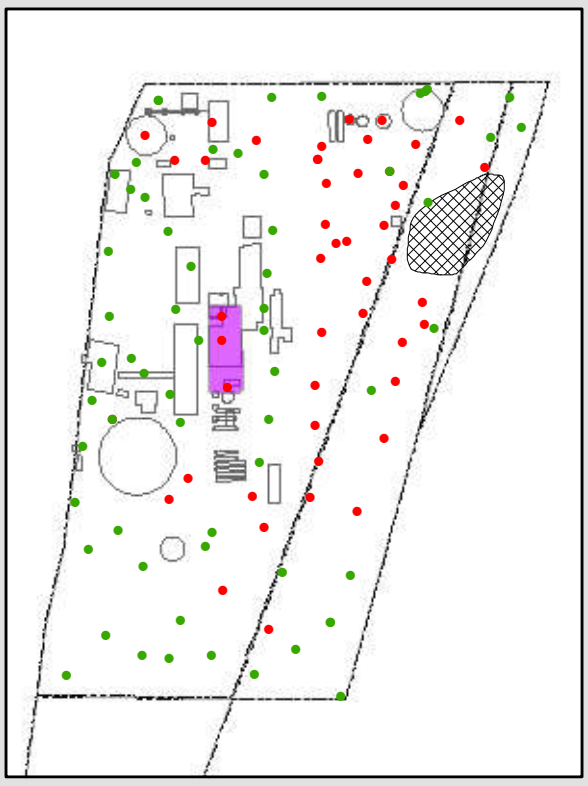


10-30 FT BGS

NAPHTHALENE



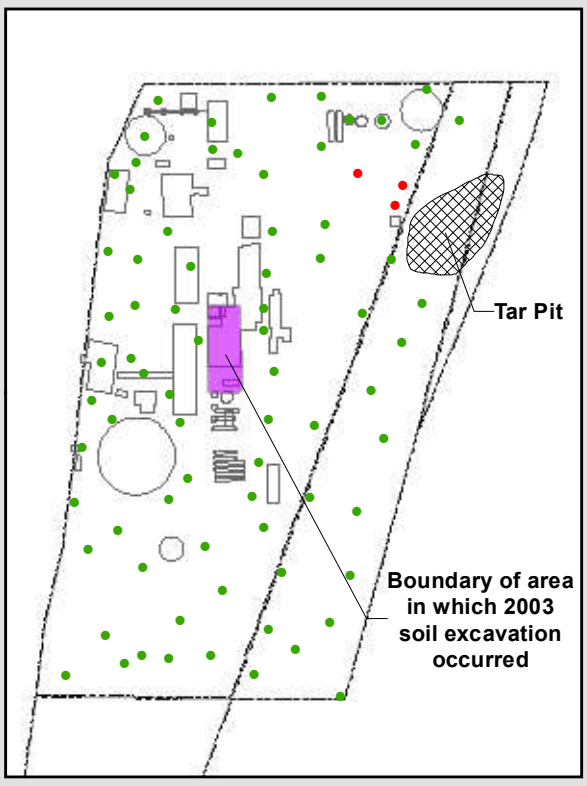
0-3 FT BGS



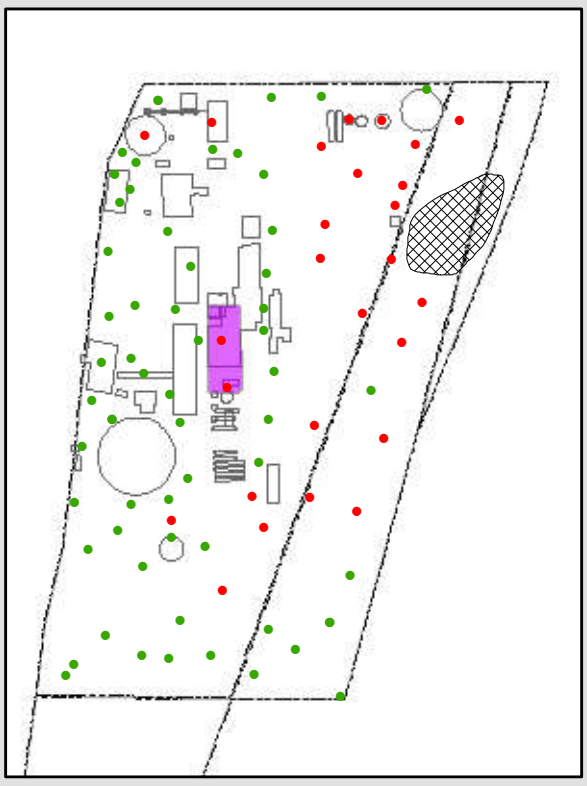
3-10 FT BGS

10-30 FT BGS

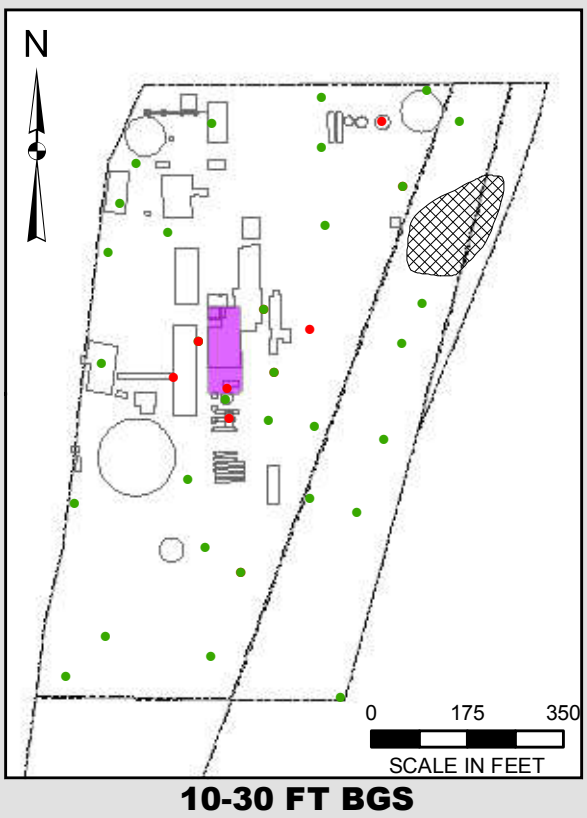
ETHYLBENZENE



0-3 FT BGS



3-10 FT BGS



10-30 FT BGS

Soil Boring Location

- Analytical Result Below Screening Level
- Analytical Result Exceeding Screening Level
- Historic Site Features
- Parcel Boundaries

2011 HIERARCHY SOIL SCREENING LEVELS (IL) (µg/Kg)		
BENZENE	NAPHTHALENE	ETHYLBENZENE
1,100	3,600	5,400

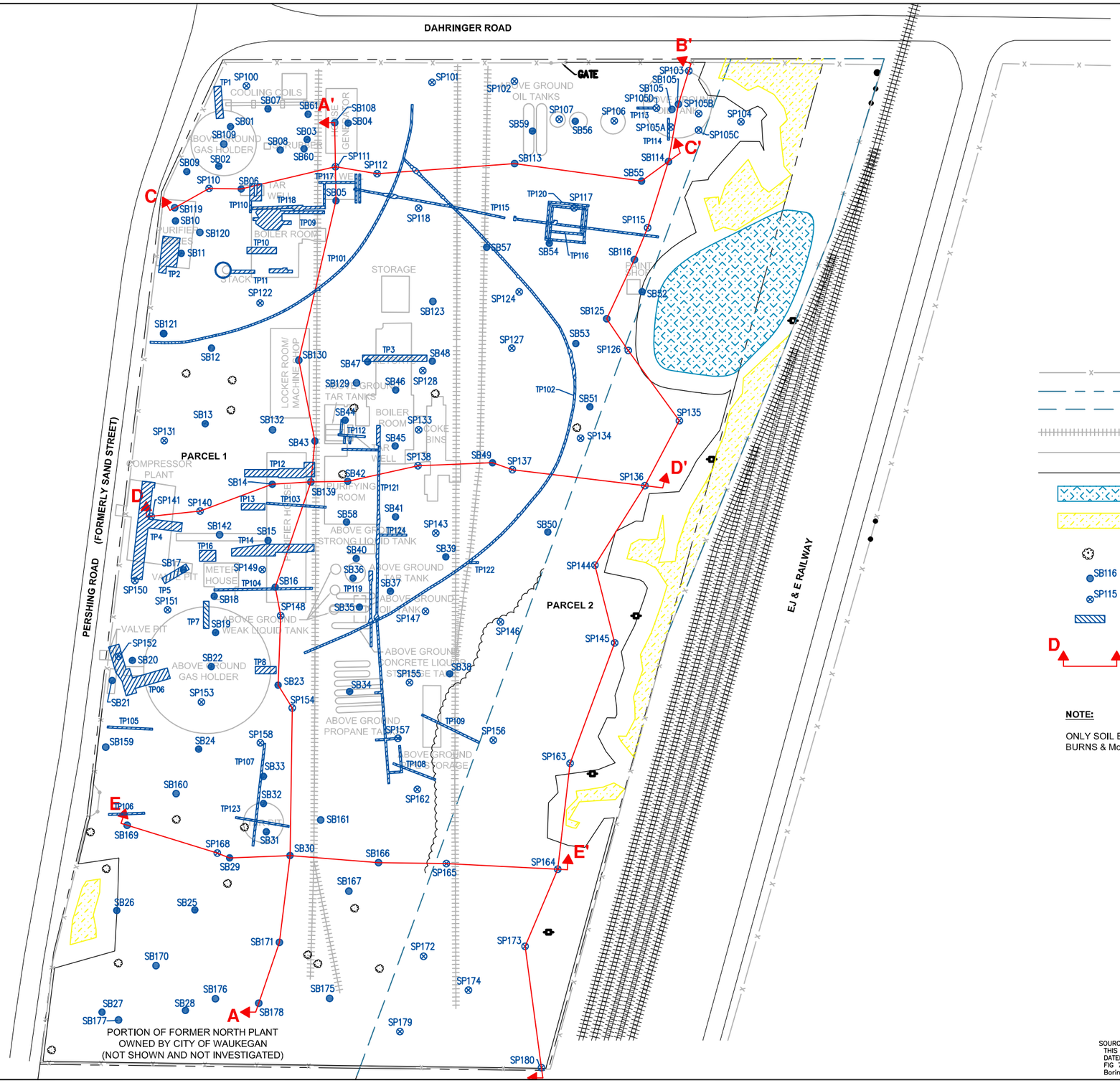
BENZENE, NAPHTHALENE, AND ETHYLBENZENE DISTRIBUTION IN SOIL

SITE SPECIFIC WORK PLAN
FORMER NSG NORTH PLANT SITE
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1986
FIGURE NO. 7

DRAWN BY/DATE: TDC 11/4/11
CHECKED BY/DATE: EPK 11/7/11
APPROVED BY/DATE:



LEGEND

- FENCE
- PROPERTY LINE
- PARCEL LINE
- RAILROAD TRACKS
- HISTORICAL STRUCTURES
- SILT FENCE
- PONDED WATER (FORMER TAR PIT)
- WETLAND
- EXISTING TREE
- SB116 — BURNS & McDONNELL SOIL BORING LOCATION
- SP115 — BURNS & McDONNELL SOIL PROBE LOCATION
- TEST PIT LOCATION
- D — D' GEOLOGIC CROSS-SECTION LOCATION

NOTE:

ONLY SOIL BORINGS, PROBES AND TEST PITS ADVANCED BY BURNS & McDONNELL ARE PRESENTED IN CROSS SECTIONS.

N

0 60' 120'
SCALE IN FEET

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS–McDONNELL DIGITAL FILES DATED 12–04–08:
FIG 7 XSECTION LOC.DWG, Base50b.DWG, Base50D.DWG, Base50F.DWG, BMCD SAMPS.dwg, BMCD TEST PITS–REV.dwg, Borings.dwg, HISTORICAL.dwg, nplntlay.dwg, TEST PITS 09–2004.dwg, UTILITIES.dwg, WETLAND–POND PLAT.dwg

DRAWN BY: SJD DATE: 6/22/11
CHECKED BY: EPK DATE: 6/22/11
APPROVED BY: EPK DATE: 6/28/11
DRAWING NO:1986–2–B08C
REFERENCE:.

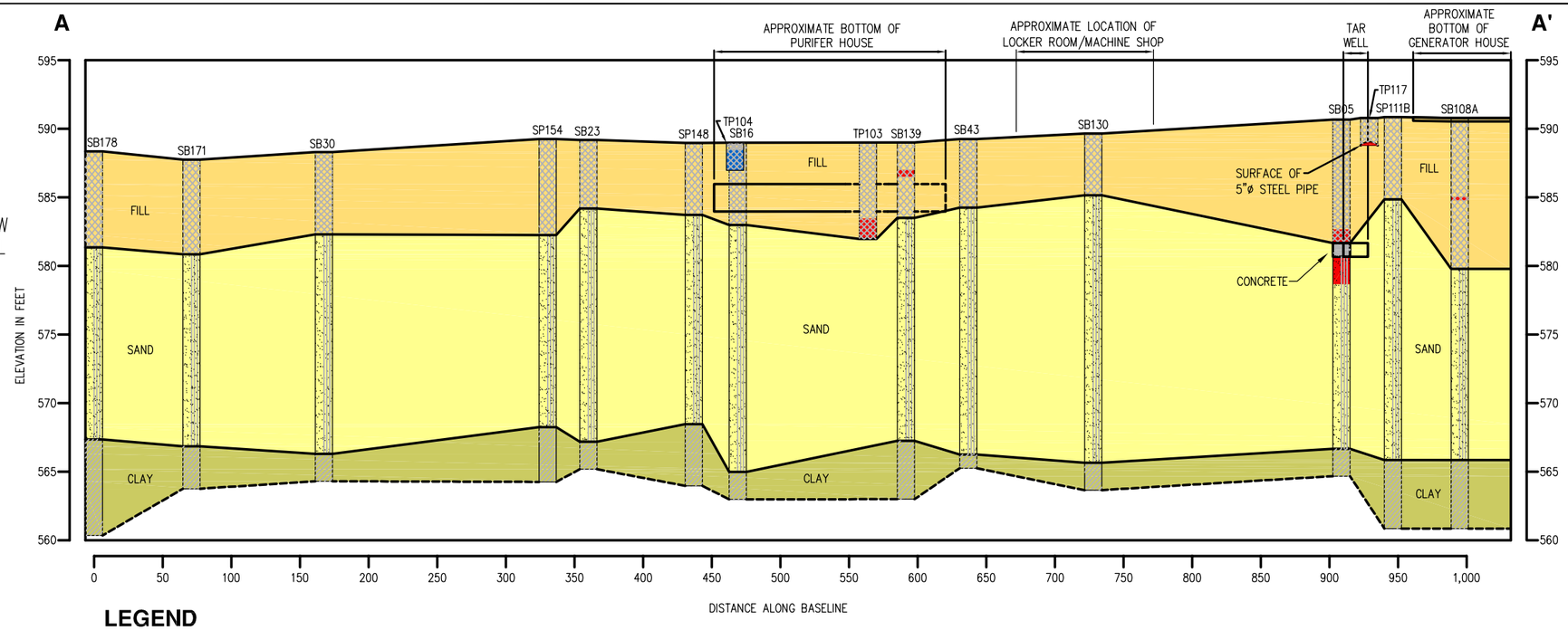
GEOLOGIC CROSS–SECTION LOCATION MAP

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
8



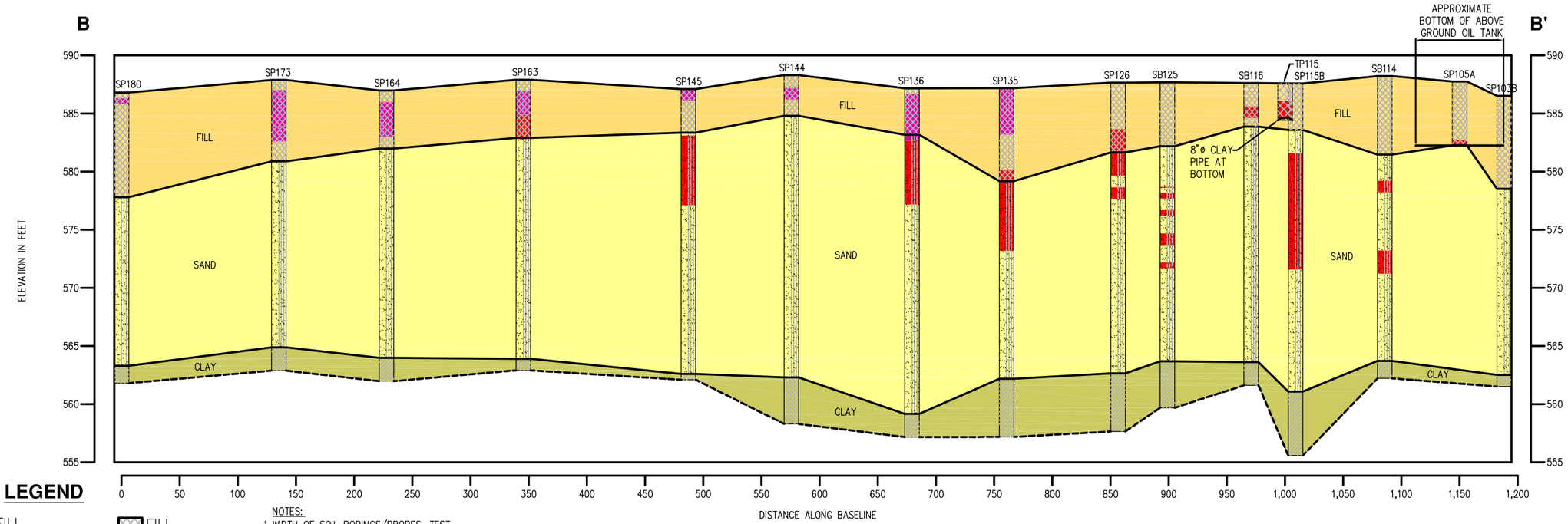
LEGEND

- FILL
- SAND
- CLAY
- CONCRETE
- TAR SATURATED MATERIAL
- FILL
- SAND
- CLAY
- CONCRETE
- BLUE/YELLOW STAINED SOIL

NOTES:
1. WIDTH OF SOIL BORINGS/PROBES, TEST PITS AND FEATURES WITHIN TEST PITS MAY BE EXAGGERATED HORIZONTALLY TO SHOW DETAIL.
2. ACTUAL THICKNESS OF CLAY IS UNKNOWN. IT WAS CONSISTENTLY ENCOUNTERED IN ALL BORINGS.

5 0 5 10
VERTICAL SCALE IN FEET

50 0 50 100
HORIZONTAL SCALE IN FEET



LEGEND

- FILL
- SAND
- CLAY
- TAR SATURATED MATERIAL
- FILL
- SAND
- CLAY
- GYPSUM

NOTES:
1. WIDTH OF SOIL BORINGS/PROBES, TEST PITS AND FEATURES WITHIN TEST PITS MAY BE EXAGGERATED HORIZONTALLY TO SHOW DETAIL.
2. ACTUAL THICKNESS OF CLAY IS UNKNOWN. IT WAS CONSISTENTLY ENCOUNTERED IN ALL BORINGS.

5 0 5 10
VERTICAL SCALE IN FEET

50 0 50 100
HORIZONTAL SCALE IN FEET

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS–McDONNELL DIGITAL FILES DATED 12–04–08:
FIG 8 XSECTION A–B.DWG

GEOLOGIC CROSS SECTIONS A–A' AND B–B'

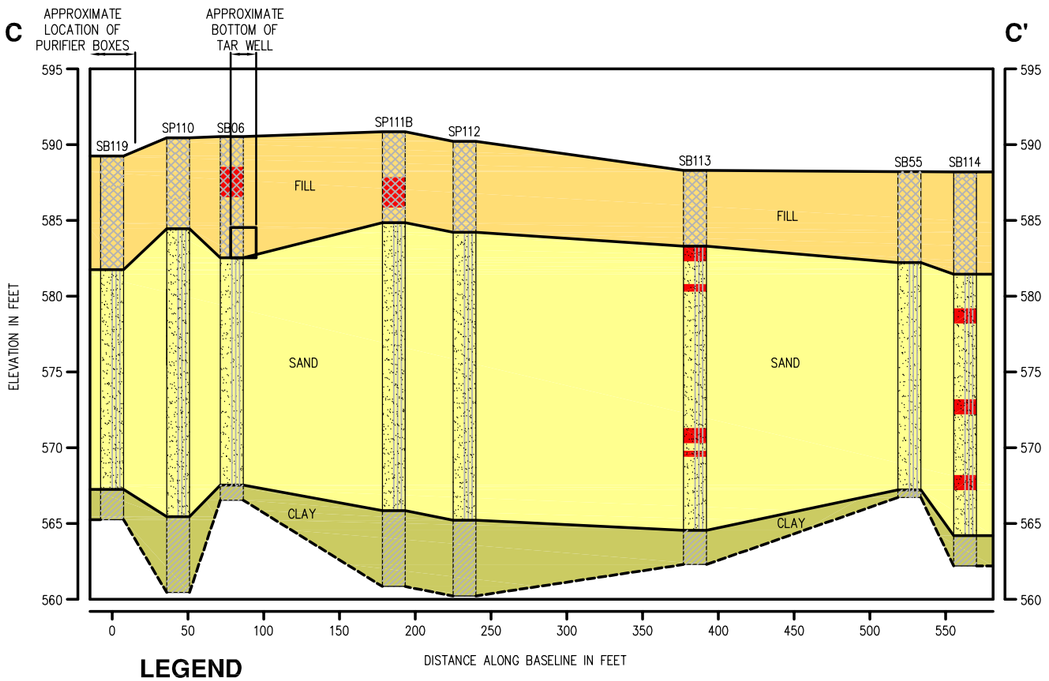
SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

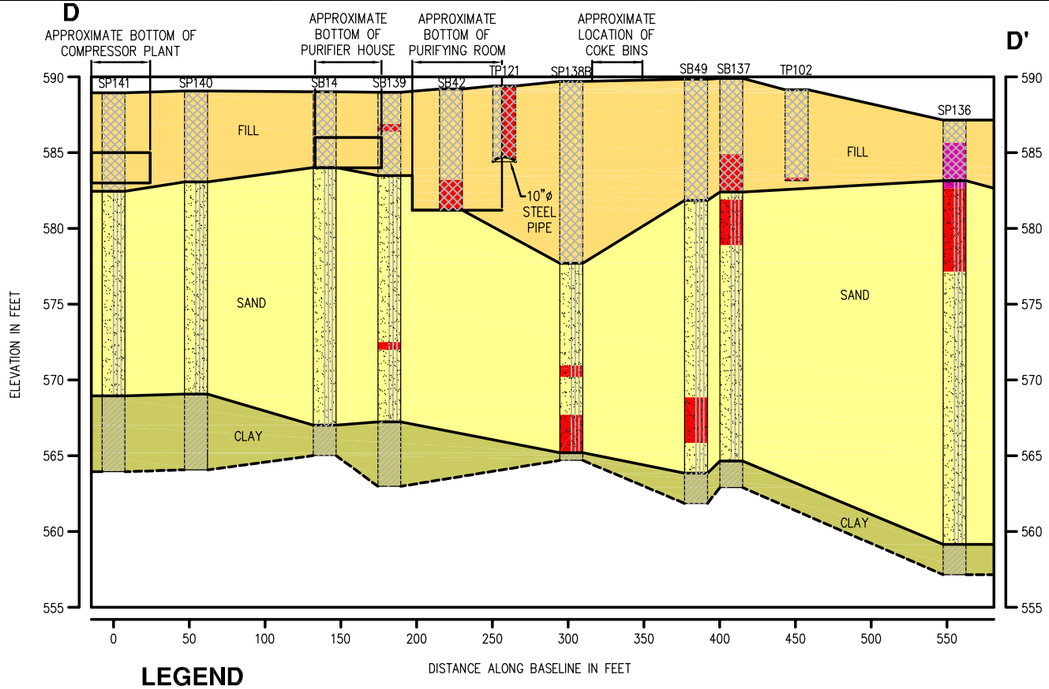
DRAWN BY: SJD	DATE: 6/22/11	
CHECKED BY: EPK	DATE: 6/22/11	
APPROVED BY: EPK	DATE: 6/28/11	
DRAWING NO:1986-2-B09C		
REFERENCE:.		

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
9





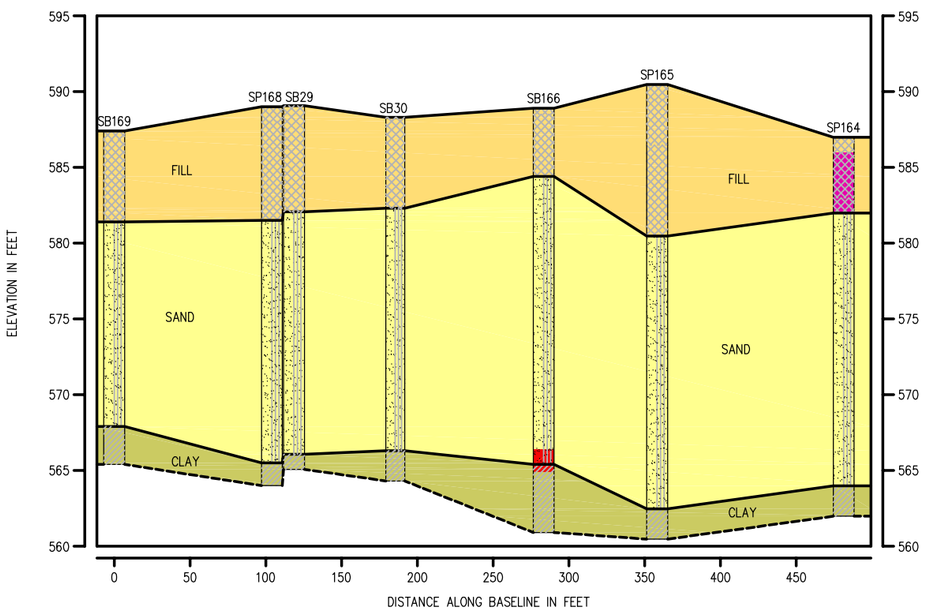
LEGEND

FILL
SAND
CLAY
TAR SATURATED MATERIAL

FILL
SAND
CLAY

NOTES:
1. WIDTH OF SOIL BORINGS/PROBES, TEST PITS AND FEATURES WITHIN TEST PITS MAY BE EXAGGERATED HORIZONTALLY TO SHOW DETAIL.
2. ACTUAL THICKNESS OF CLAY IS UNKNOWN. IT WAS CONSISTENTLY ENCOUNTERED IN ALL BORINGS.

VERTICAL SCALE IN FEET: 5 0 5 10
HORIZONTAL SCALE IN FEET: 50 0 50 100



LEGEND

FILL
SAND
CLAY
TAR SATURATED MATERIAL

FILL
SAND
CLAY
GYPSUM

NOTES:
1. WIDTH OF SOIL BORINGS/PROBES, TEST PITS AND FEATURES WITHIN TEST PITS MAY BE EXAGGERATED HORIZONTALLY TO SHOW DETAIL.
2. ACTUAL THICKNESS OF CLAY IS UNKNOWN. IT WAS CONSISTENTLY ENCOUNTERED IN ALL BORINGS.

VERTICAL SCALE IN FEET: 5 0 5 10
HORIZONTAL SCALE IN FEET: 50 0 50 100

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS–McDONNELL DIGITAL FILES DATED 12–04–08:
FIG 9 XSECTION C–D–E.DWG

DRAWN BY: SJD DATE: 6/22/11
CHECKED BY: EPK DATE: 6/22/11
APPROVED BY: EPK DATE: 6/28/11
DRAWING NO:1986–2–B10C
REFERENCE:.

GEOLOGIC CROSS SECTIONS C–C', D–D' AND E–E'

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO. 1986/2.0

FIGURE NO. 10

CLAY SURFACE CONTOUR MAP

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

DRAWN BY: RLH	DATE: 6/22/11	
CHECKED BY: EPK	DATE: 6/22/11	
APPROVED BY: EPK	DATE: 6/28/11	
DRAWING NO:1986-2-B11C		
REFERENCE:.		

DAHRINGER ROAD

PERSHING ROAD (FORMERLY SAND STREET)

EJ & E RAILWAY

PORTION OF FORMER NORTH PLANT
OWNED BY CITY OF WAUKEGAN
(NOT SHOWN AND NOT INVESTIGATED)
48"ø SANITARY SEWER

LEGEND

- 560 — CLAY SURFACE ELEVATION CONTOUR, FT.
- SP133 — SOIL PROBE LOCATION
- SB166 — SOIL BORING LOCATION
- POWER POLE
- RAILROAD TRACKS
- FENCE

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS-McDONNELL DIGITAL FILES:
Base50b.dwg, Base50D.dwg, Base50F.dwg, Borings.dwg, HISTORICAL.dwg, npintgy.dwg, UTILITIES.dwg, WETLAND-POND PLAT.dwg.
CLAY SURFACE ELEVATION CONTOURS GENERATED ARE BASED ON SOIL BORING LOGS COMPLETED BY BURNS McDONNELL IN 2002 AND 2004. REPORTING DATUM IS NAVD 1988. LOGS WERE TAKEN FROM THE FOLLOWING REPORT:
COMPREHENSIVE SITE INVESTIGATION REPORT, FORMER NORTH PLANT MANUFACTURED GAS PLANT, OPERATIONAL AREA AND ADJACENT PROPERTY, WAUKEGAN, ILLINOIS, OCTOBER 2005.

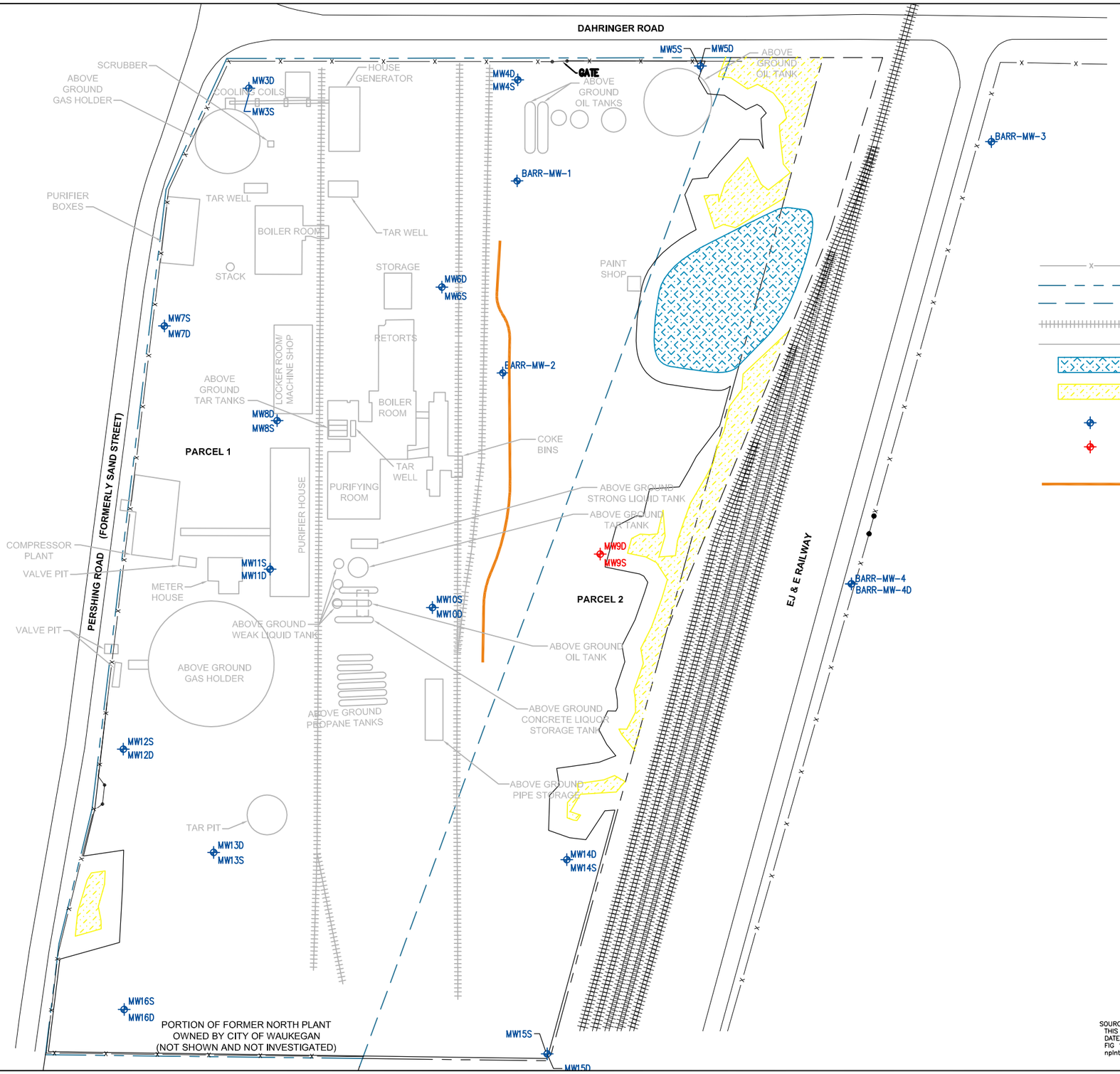
N

60 0 60 120
SCALE IN FEET

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
11



LEGEND

- FENCE
- PROPERTY LINE
- PARCEL LINE
- RAILROAD TRACKS
- HISTORICAL STRUCTURES
- PONDED WATER (FORMER TAR PIT)
- WETLAND
- GROUNDWATER MONITORING WELL
- TAR IN WELL
- HISTORIC DITCH LOCATION

NOTES:

1. MW10S IDENTIFIES A SHALLOW WELL SCREENED FROM 3 TO 8 FEET BGS IN THE UNCONFINED SHALLOW AQUIFER.
2. MW10D IDENTIFIES A DEEP WELL SCREENED FROM 21 TO 26 FEET BGS IN THE SAME UNCONFINED SHALLOW AQUIFER.
3. THE HISTORIC DITCH WAS APPROXIMATED FROM THE 1958 & 1964 AERIAL PHOTOGRAPHY.

N

0 60' 120'
SCALE IN FEET

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS–McDONNELL DIGITAL FILES DATED 12–04–08:
FIG 10 MONITORING WELL LOCATION MAP.DWG, Base50b.DWG, Base50F.DWG,Borings.dwg,HISTORICAL.dwg, npintlay.dwg, SAMPLOC IMPL MAP.dwg, UTILITIES.dwg, WETLAND–POND PLAT.dwg

DRAWN BY: SJD/RJG DATE: 11/17/11
CHECKED BY: EPK DATE: 11/17/11
APPROVED BY: EPK DATE: 11/17/11
DRAWING NO: 1986-2-B12C
REFERENCE:.

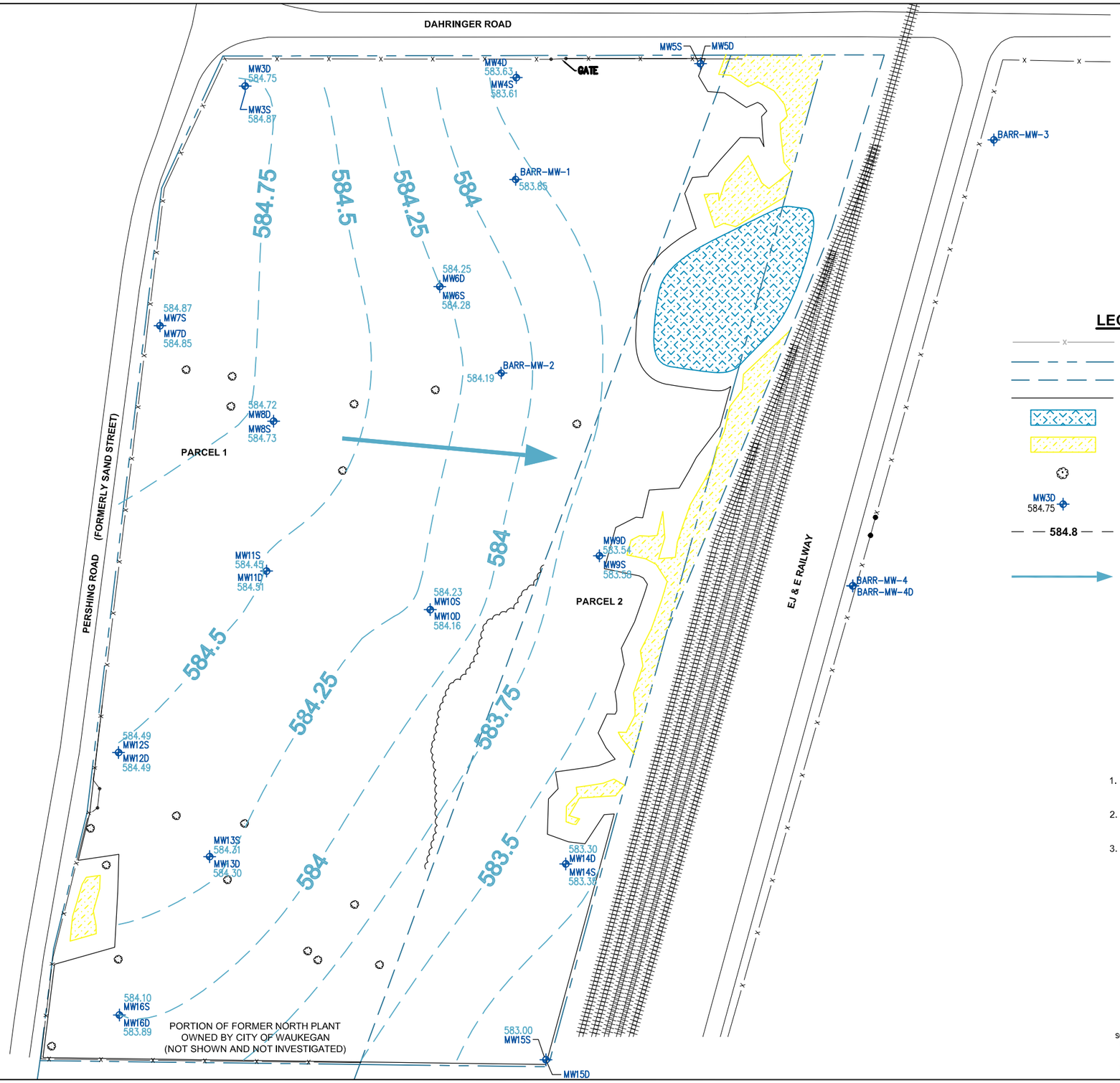
GROUNDWATER MONITORING WELL LOCATION MAP

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
12



LEGEND

- FENCE
- PROPERTY LINE
- PARCEL LINE
- SILT FENCE
- PONDED WATER (FORMER TAR PIT)
- WETLAND
- EXISTING TREE
- MW3D 584.75 — GROUNDWATER MONITORING WELL
- 584.8 — GROUNDWATER CONTOUR LINE (0.25-FOOT CONTOUR INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION (AUGUST 2004)

NOTES:

1. ACCURATE WATER LEVEL DATA COULD NOT BE OBTAINED FROM THE MW5 LOCATION IN AUGUST 2004.
2. OFFSITE WELLS NOT ACCESSIBLE DURING THE AUGUST 2004 EVENT.
3. GROUNDWATER ELEVATIONS ARE MEAN SEA LEVEL.

N

0 60' 120'
SCALE IN FEET

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS-McDONNELL DIGITAL FILES DATED 12-04-08:
FIG 11 GW CONTOUR MAP-AUGUST 2004.DWG, Base50b.DWG, Base50F.DWG, Borings.dwg, gw contour map August 2004 Re-Done.dwg, npintlay.dwg, SAMPLOC IMPL MAP.dwg, UTILITIES.dwg, WETLAND-POND PLAT.dwg

DRAWN BY: SJD DATE: 6/22/11
CHECKED BY: EPK DATE: 6/22/11
APPROVED BY: EPK DATE: 6/28/11
DRAWING NO:1986-2-B13C
REFERENCE:.

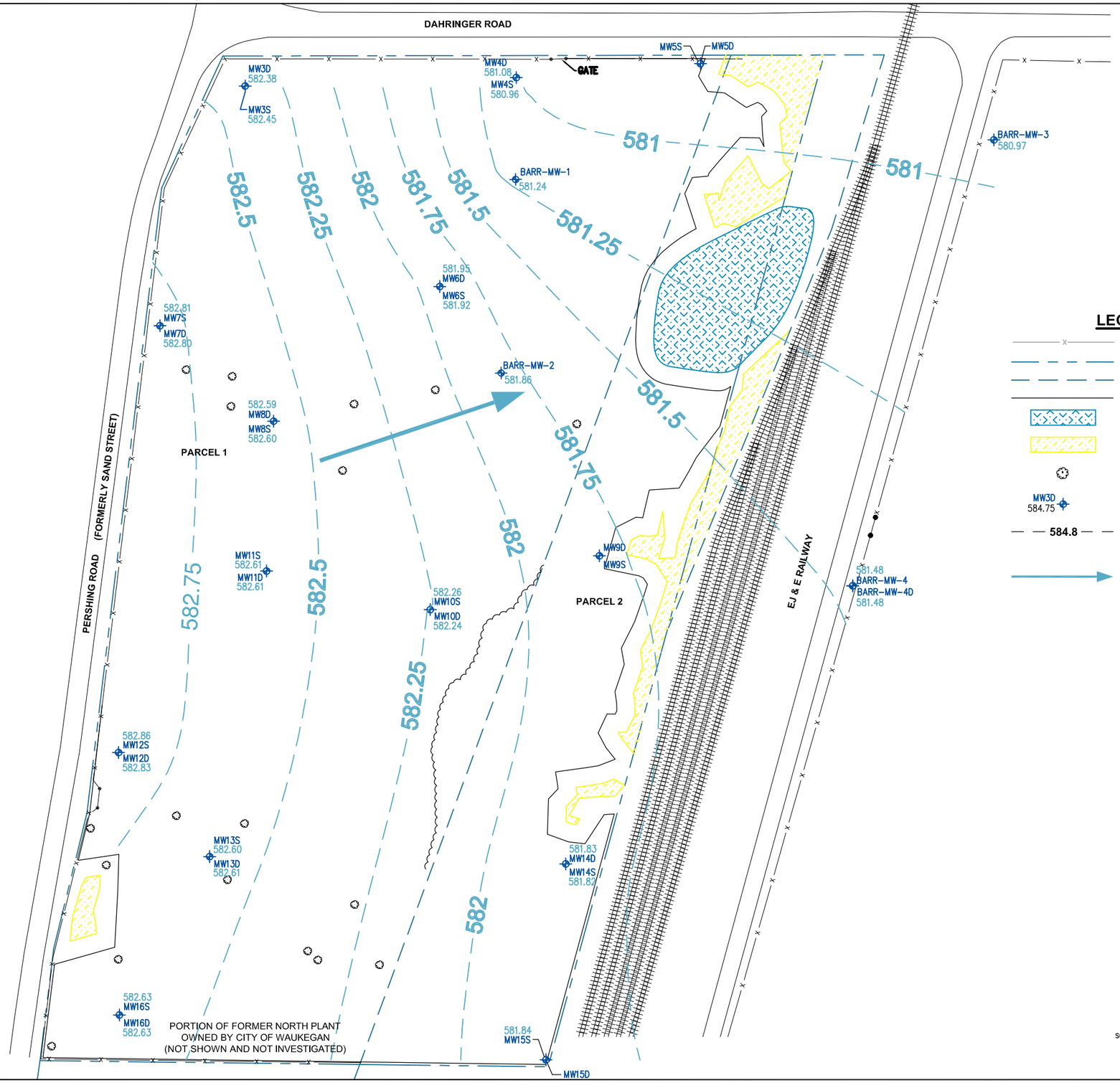
WATER TABLE CONTOUR MAP-AUGUST 2004

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

FIGURE NO.
13



NOTES:

1. ACCURATE WATER LEVEL DATA COULD NOT BE OBTAINED FROM THE MW5 LOCATION IN OCTOBER 2004.
2. GROUNDWATER ELEVATIONS ARE MEAN SEA LEVEL.

SOURCE NOTE:
THIS DRAWING WAS DEVELOPED FROM THE FOLLOWING BURNS–McDONNELL DIGITAL FILES DATED 12–04–08:
FIG 11 GW CONTOUR MAP–AUGUST 2004.DWG, Base50b.DWG, Base50F.DWG, Borings.dwg, npintlay.dwg, SAMPLOC IMPL MAP.dwg, UTILITIES.dwg, WETLAND–POND PLAT.dwg

DRAWN BY: SJD DATE: 6/22/11
CHECKED BY: EPK DATE: 6/22/11
APPROVED BY: EPK DATE: 6/28/11
DRAWING NO:1986-2-B14C
REFERENCE:.

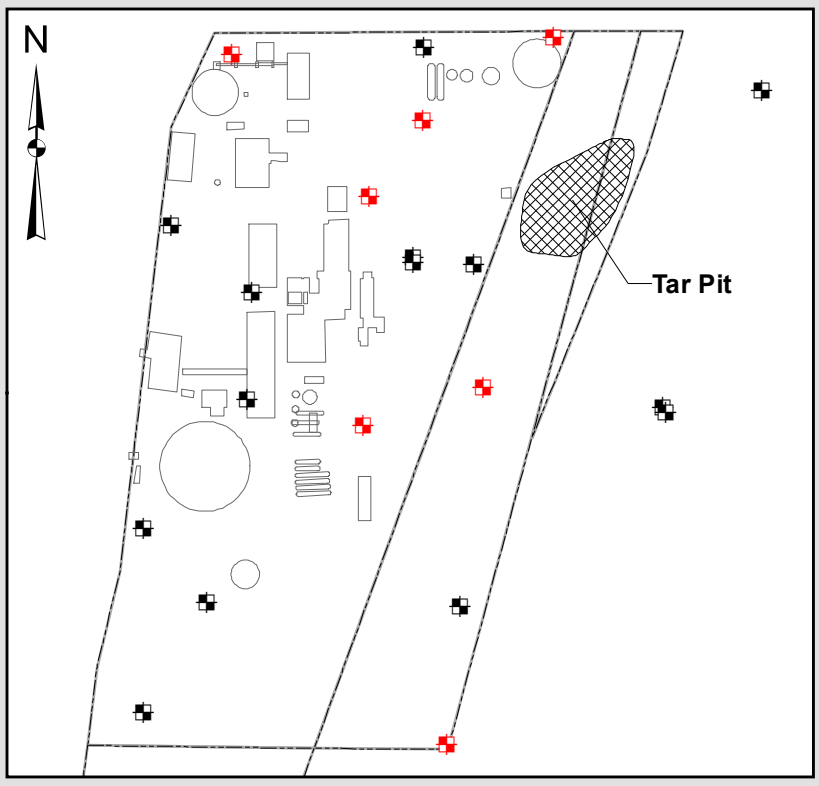
WATER TABLE CONTOUR MAP–OCTOBER 2004

SITE SPECIFIC WORK PLAN
FORMER NORTH PLANT
NORTH SHORE GAS COMPANY
WAUKEGAN, ILLINOIS

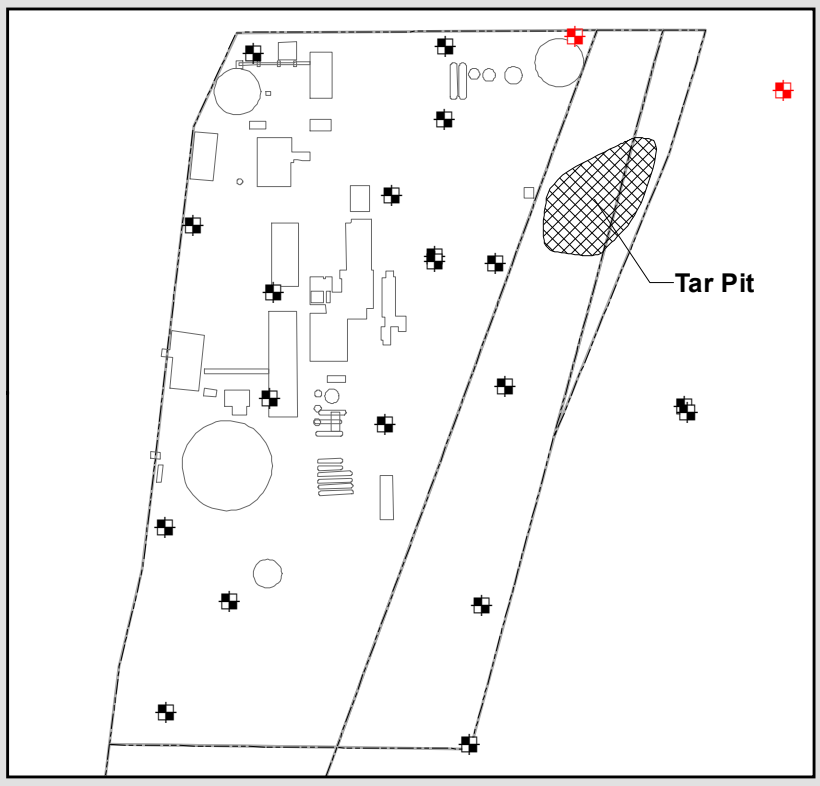
NATURAL RESOURCE TECHNOLOGY

PROJECT NO.
1986/2.0

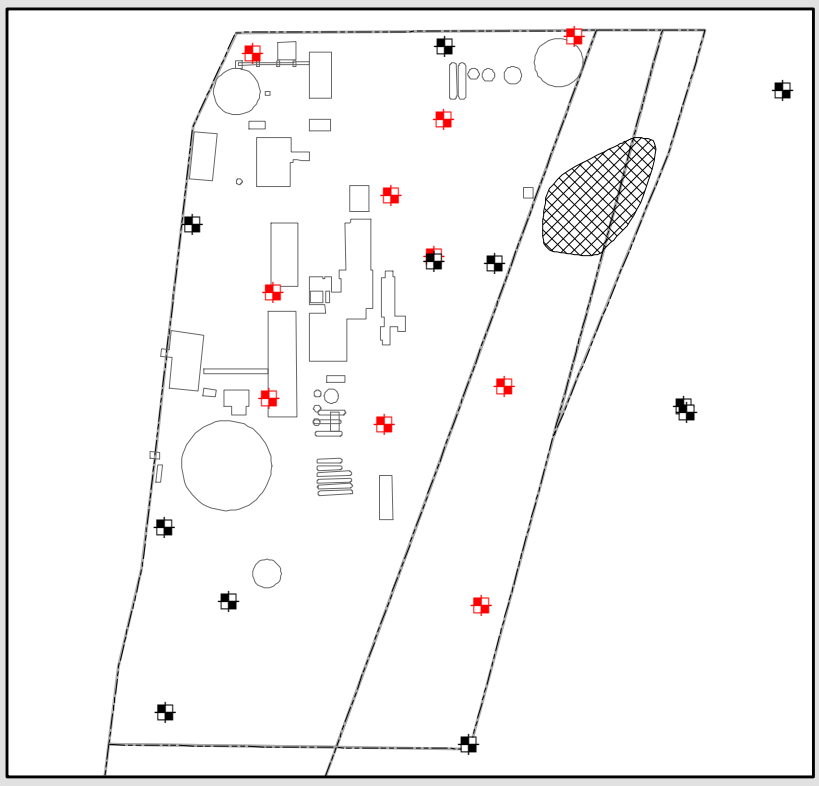
FIGURE NO.
14



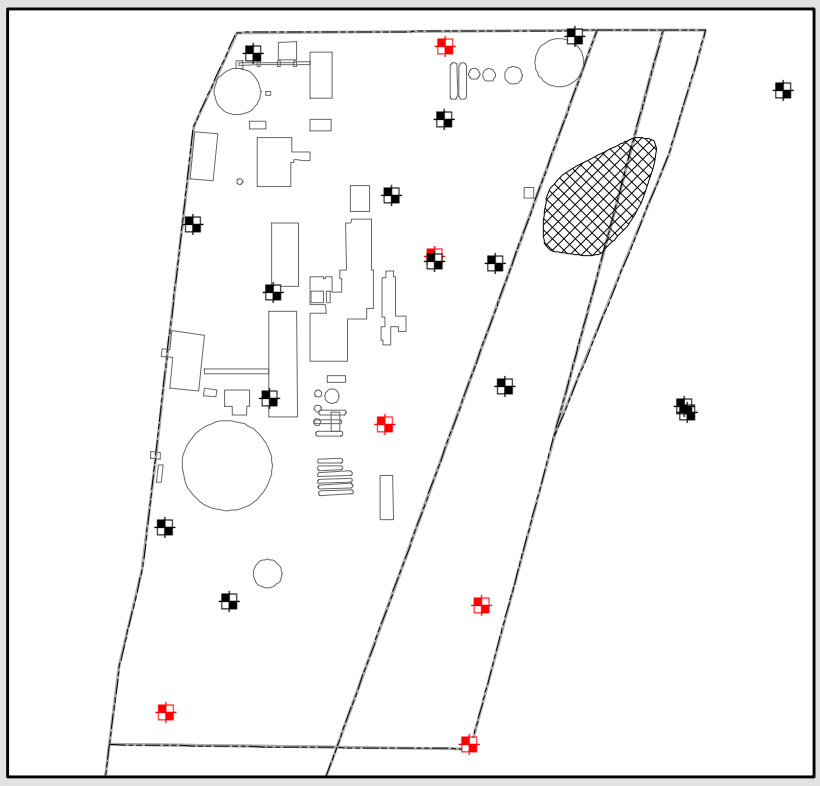
Benzene



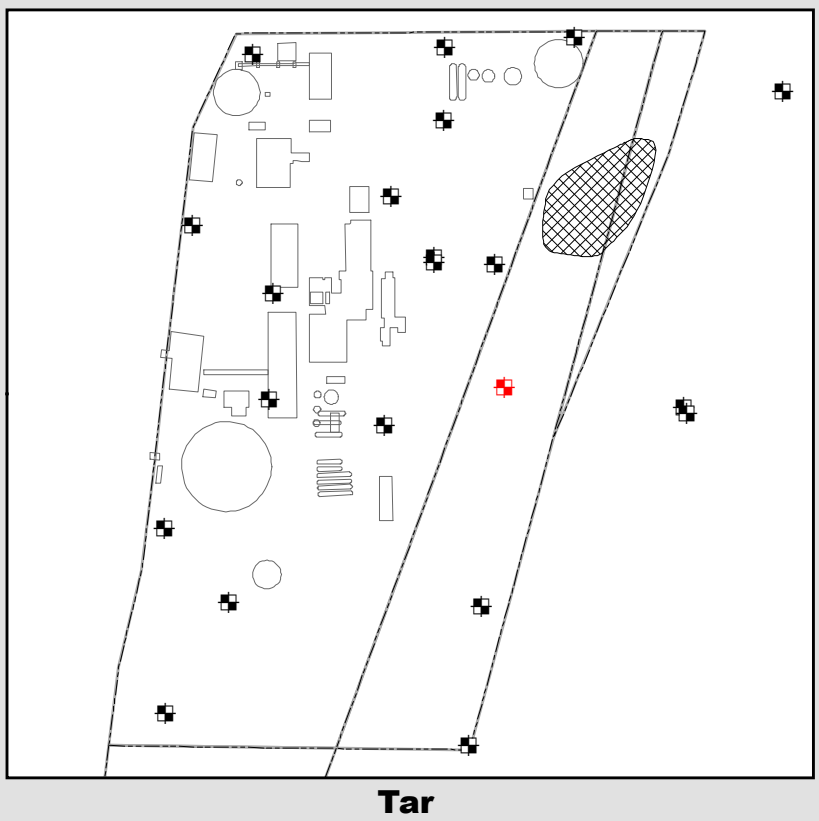
CVOCs



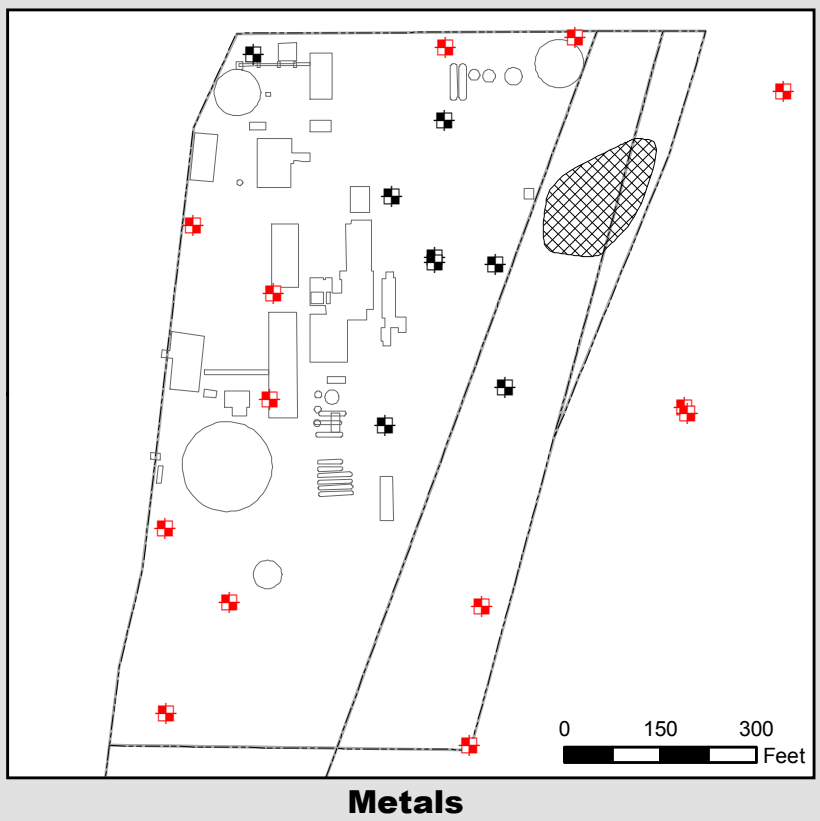
PAHs



SVOCs (excluding PAHs)



Tar



Metals

Result Below Screening Level
Result Above Screening Level
Historic Site Features
Parcel Boundaries

Note: Refer to Tables 9-12 for specific compounds and concentrations

Groundwater Concentrations Exceeding RAF Screening Levels

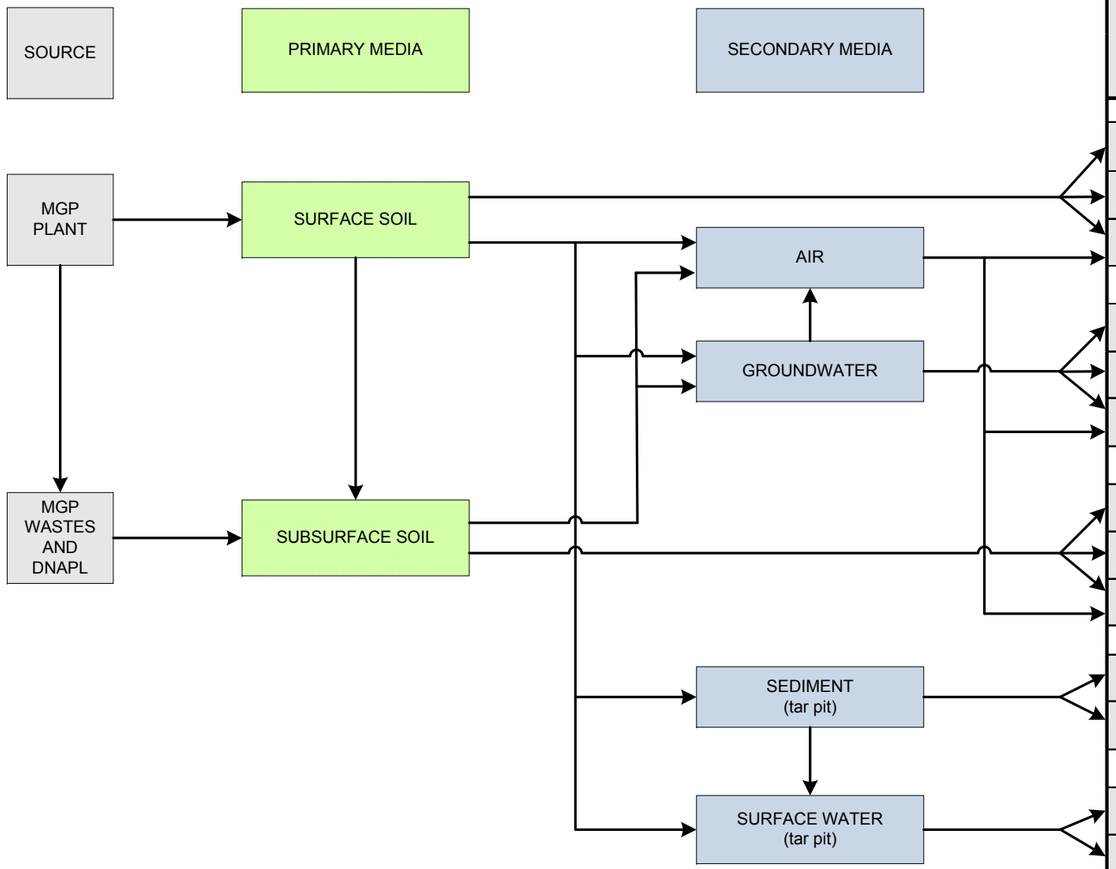
Site Specific Work Plan
Former NSG North Plant Site
Waukegan, Illinois

Natural Resource Technology

Project No. 1986
Figure No. 15

DRAFT: 6/23/2011
FINAL: 11/14/2011
APPV'D BY: EPK

Y:\GIS\Projects\19\1986\MXD\Figure 15_GW Conc Exceeding RAF_x6.mxd



EXPOSURE ROUTE	HUMAN RECEPTORS				ECOLOGICAL RECEPTORS			
	INDUSTRIAL/ COMMERCIAL WORKER	CONSTRUCTION WORKER	RECREATIONAL	RESIDENTIAL	BIRDS	MAMMALS	FISH	BENTHIC INVERTEBRATES / AMPHIBIANS
INGESTION	●	◊	●	◊	●	●	NA	NA
DERMAL	●	◊	●	◊	●	●	NA	NA
INHALATION	●	◊	●	◊	●	●	NA	NA
INGESTION	◊	◊	◊	◊	○	○	NA	NA
DERMAL	○	◊	○	◊	○	○	NA	NA
INHALATION	●	◊	○	◊	○	○	NA	NA
INGESTION	◊	◊	◊	◊	◊	●	NA	NA
DERMAL	◊	◊	◊	◊	◊	●	NA	NA
INHALATION	◊	◊	◊	◊	◊	●	NA	NA
INGESTION	●	◊	●	◊	●	●	NA	●
DERMAL	●	◊	●	◊	●	●	NA	●
INGESTION	●	◊	●	◊	●	●	NA	●
DERMAL	●	◊	●	◊	●	●	NA	●

1. The soil ecological screening levels used to evaluate potential risks to birds and mammals also address potential risks to lower trophic level ecological receptors, such as plants and soil invertebrates.

PROJECT No. 1986		SITE-SPECIFIC CONCEPTUAL SITE MODEL FOR THE NORTH PLANT MGP SITE NORTH SHORE GAS COMPANY WAUKEGAN, ILLINOIS	Drawn By:EMB	Date 11/21/2011
Revision 2	NATURAL RESOURCE TECHNOLOGY		Checked	EPK
Figure 16			Approved	JMK

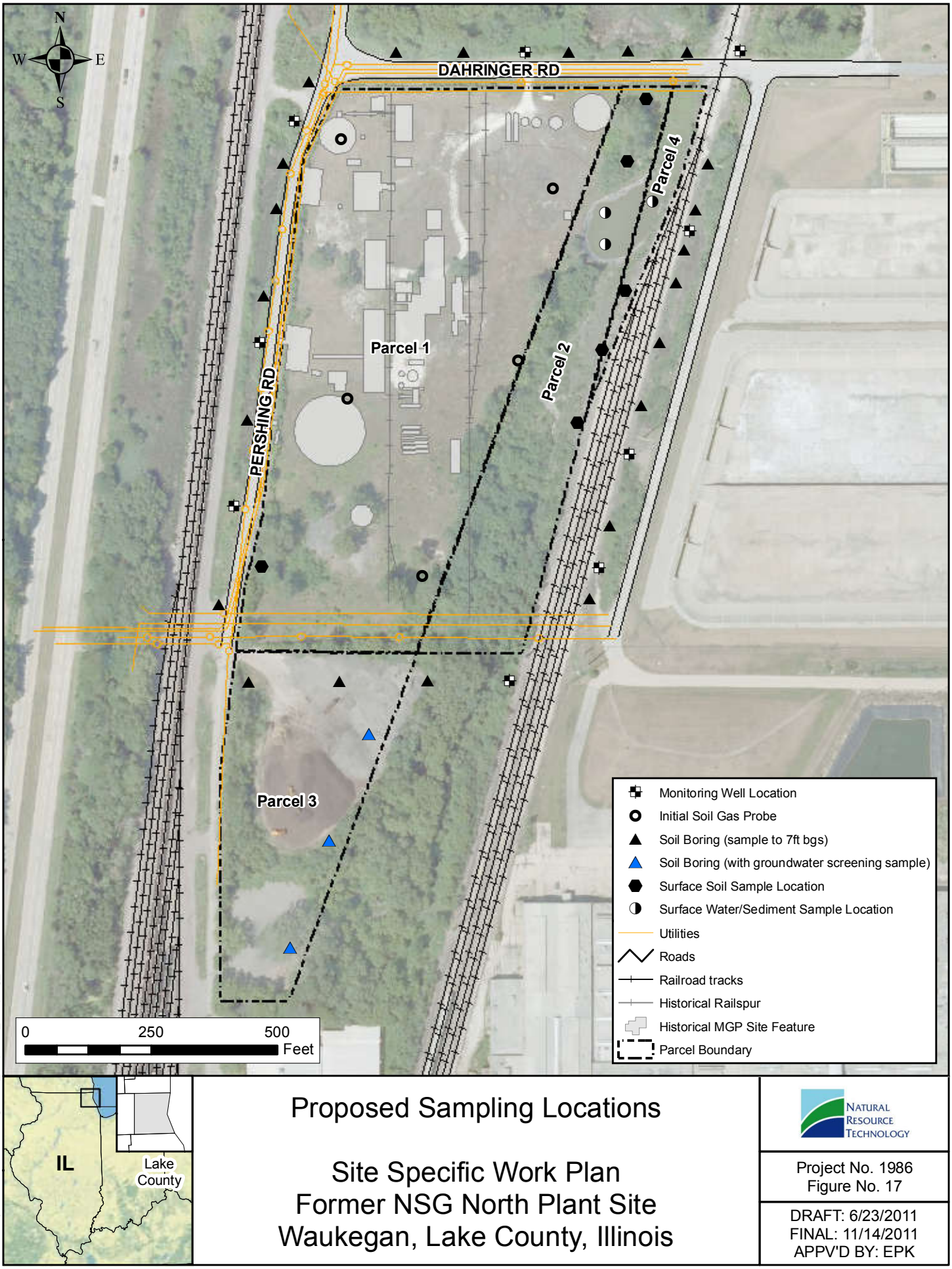
LEGEND:

● Pathway potentially complete and warrants further evaluation within the Baseline Risk Assessment.

◊ Pathway not complete or considered insignificant under current land use condition, but will be evaluated because it may be potentially complete under future land use scenarios.

○ Pathway not complete or considered insignificant; No further evaluation is recommended.

NA: Not Applicable



Proposed Sampling Locations

Site Specific Work Plan
Former NSG North Plant Site
Waukegan, Lake County, Illinois

Natural Resource Technology

Project No. 1986
Figure No. 17

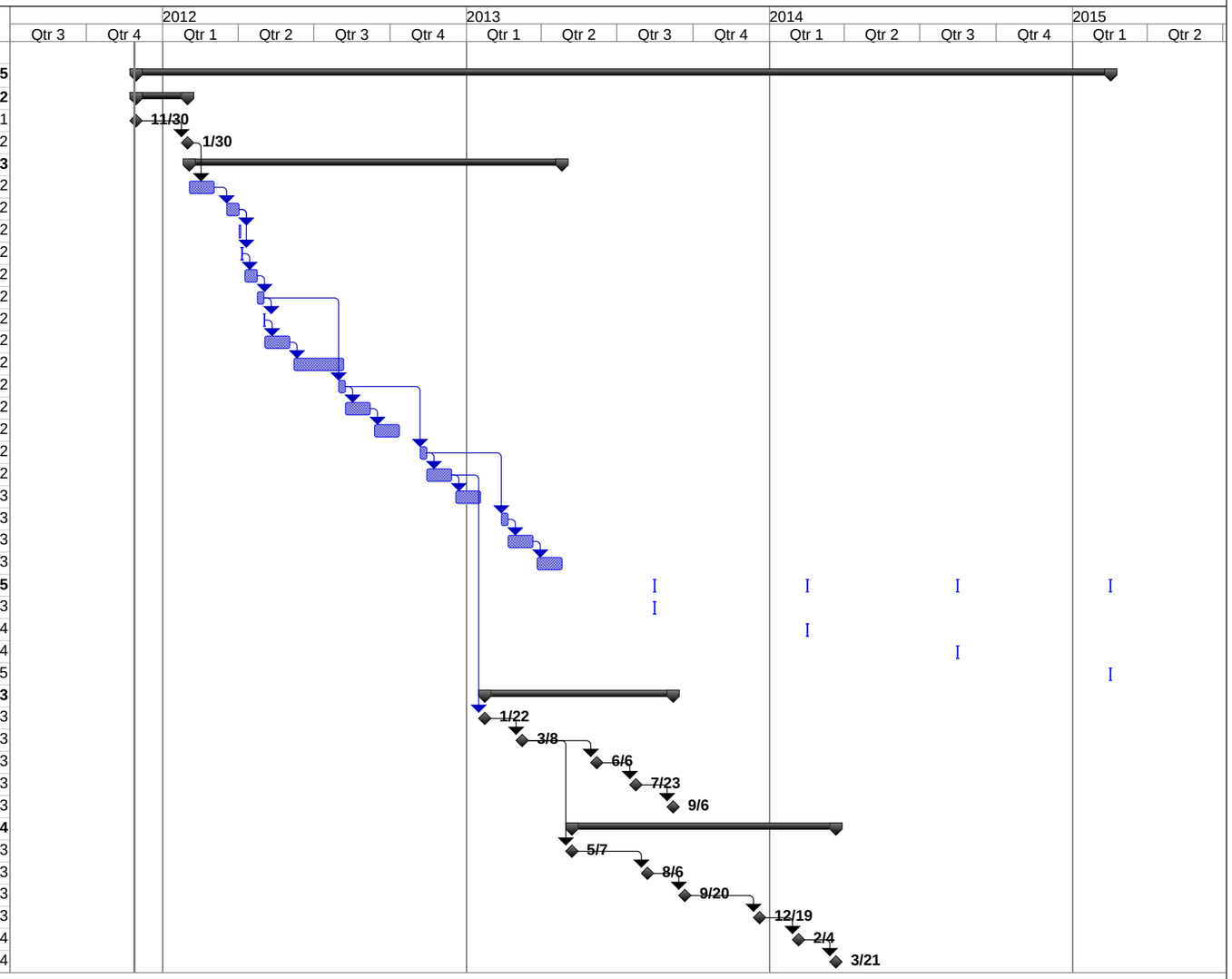
DRAFT: 6/23/2011
FINAL: 11/14/2011
APPV'D BY: EPK

Y:\GIS\Projects\19\1986\MXD\Figure 17_Proposed_Sampling_Locs.mxd

FIGURE 18 PROPOSED SCHEDULE

Former North Plant Manufactured Gas Plant
Integrys Business Support, LLC
North Shore Gas (V-W-07-C-877)

ID	Task Name	Duration	Start	Finish
1				
2	**NSG Waukegan North Plant**	**1174 days**	**Wed 11/30/11**	**Sun 2/15/15**
3	**Site-Specific Work Plan**	**62 days**	**Wed 11/30/11**	**Mon 1/30/12**
4	Submit SSWP - Rev 2 to USEPA	0 days	Wed 11/30/11	Wed 11/30/11
5	USEPA approves SSWP - Rev 2	0 days	Mon 1/30/12	Mon 1/30/12
6	**Implement RI Field Activities**	**449 days**	**Thu 2/2/12**	**Thu 4/25/13**
7	Contractor Procurement	30 days	Thu 2/2/12	Fri 3/2/12
8	Boring Installation/Sampling	15 days	Sun 3/18/12	Sun 4/1/12
9	Soil Gas Sampling	2 days	Mon 4/2/12	Tue 4/3/12
10	Sediment Sampling (former tar pit)	1 day	Thu 4/5/12	Thu 4/5/12
11	Groundwater Monitoring Well Installation/Development	15 days	Mon 4/9/12	Mon 4/23/12
12	First Quarter RI GW Sampling	8 days	Tue 4/24/12	Tue 5/1/12
13	Surface Water Sampling (former tar pit)	1 day	Wed 5/2/12	Wed 5/2/12
14	Laboratory Analysis (includes first quarter gw)	30 days	Thu 5/3/12	Fri 6/1/12
15	Data Validation (includes first quarter gw)	60 days	Thu 6/7/12	Sun 8/5/12
16	Second Quarter RI GW Sampling	8 days	Tue 7/31/12	Tue 8/7/12
17	Laboratory Analysis (second quarter gw)	30 days	Wed 8/8/12	Thu 9/6/12
18	Data Validation (second quarter gw)	30 days	Wed 9/12/12	Thu 10/11/12
19	Third Quarter RI GW Sampling	8 days	Tue 11/6/12	Tue 11/13/12
20	Laboratory Analysis (third quarter gw)	30 days	Wed 11/14/12	Thu 12/13/12
21	Data Validation (third quarter gw)	30 days	Wed 12/19/12	Thu 1/17/13
22	Fourth Quarter RI GW Sampling	8 days	Tue 2/12/13	Tue 2/19/13
23	Laboratory Analysis (fourth quarter gw)	30 days	Wed 2/20/13	Thu 3/21/13
24	Data Validation (fourth quarter gw)	30 days	Wed 3/27/13	Thu 4/25/13
25	**On-Going Post RI Groundwater Sampling**	**550 days**	**Thu 8/15/13**	**Sun 2/15/15**
26	On-Going Post RI Groundwater Sampling 1	1 day	Thu 8/15/13	Thu 8/15/13
27	On-Going Post RI Groundwater Sampling 2	1 day	Sat 2/15/14	Sat 2/15/14
28	On-Going Post RI Groundwater Sampling 3	1 day	Fri 8/15/14	Fri 8/15/14
29	On-Going Post RI Groundwater Sampling 4	1 day	Sun 2/15/15	Sun 2/15/15
30	**Prepare RI Report**	**227 days**	**Tue 1/22/13**	**Fri 9/6/13**
31	Review Preliminary RI Data with USEPA	0 days	Tue 1/22/13	Tue 1/22/13
32	Submit RI Rpt - Rev 0 to USEPA	0 days	Fri 3/8/13	Fri 3/8/13
33	Receive USEPA Comments on RI Rpt - Rev 0	0 days	Thu 6/6/13	Thu 6/6/13
34	Submit RI Rpt - Rev 1 to USEPA	0 days	Tue 7/23/13	Tue 7/23/13
35	USEPA Approves RI Rpt - Rev 1	0 days	Fri 9/6/13	Fri 9/6/13
36	**Prepare FS Report**	**318 days**	**Tue 5/7/13**	**Fri 3/21/14**
37	Submit Alternatives Array Tech Memo to USEPA	0 days	Tue 5/7/13	Tue 5/7/13
38	Receive USEPA Comments on Alternatives Array Tech Memo	0 days	Tue 8/6/13	Tue 8/6/13
39	Submit FS Rpt - Rev 0 to USEPA	0 days	Fri 9/20/13	Fri 9/20/13
40	Receive USEPA Comments on FS Rpt - Rev 0	0 days	Thu 12/19/13	Thu 12/19/13
41	Submit FS Rpt - Rev 1 to USEPA	0 days	Tue 2/4/14	Tue 2/4/14
42	USEPA approves FS Rpt - Rev 1	0 days	Fri 3/21/14	Fri 3/21/14



Project: 1986 schedule 111128
Date: Mon 11/28/11

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Progress
Split	External Tasks	Inactive Summary	Manual Summary	Deadline
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

TABLES

Table 1. Summary Statistics for Soil Results (Detected Parameters)
Waukegan North Plant MGP Site

Parameter	RAF Screening Levels (µg/kg)	Minimum Conc. (µg/kg)	Maximum Conc. (µg/kg)	Number of Analyzed Samples	Samples Exceeding the MDL	Samples (& %) Exceeding the RAF Screening Levels	
Parameters that Exceeded the Risk Assessment Framework Screening Levels							
Volatile Organic Compounds (VOCs)							
Benzene	1,100	6.7	1,600,000	209	72	37	17.7%
Ethylbenzene	5,400	7	840,000	209	66	40	19.1%
Methylene chloride	11,000	5.5	17,000	209	10	3	1.4%
Xylenes, Total	630,000	9.6	2,400,000	209	73	7	3.3%
Semi-Volatile Organic Compounds (SVOCs)							
Benzo(a)anthracene	150	36	960,000	209	154	127	60.8%
Benzo(a)pyrene	15	36	810,000	209	156	156	74.6%
Benzo(b)fluoranthene	150	26	630,000	209	148	127	60.8%
Benzo(k)fluoranthene	1,500	23	420,000	209	146	73	34.9%
Carbazole	32,000	200	550,000	209	36	12	5.7%
Chrysene	15,000	44	970,000	209	157	56	26.8%
Dibenz(a,h)anthracene	15	34	88,000	209	96	96	45.9%
Dibenzofuran	78,000	30	1,300,000	209	86	21	10.0%
Indeno(1,2,3-cd)pyrene	150	34	300,000	209	138	112	53.6%
2-Methylnaphthalene	310,000	39	6,100,000	209	126	33	15.8%
Naphthalene (SVOC)	3,600	33	22,000,000	209	151	61	29.2%
Pyrene	1,700,000	43	2,300,000	209	168	6	2.9%
Inorganic Compounds/Elements							
Antimony, Total	31,000	2,100	32,000	194	22	1	0.5%
Arsenic, Total	31,000	510	220,000	194	163	11	5.7%
Copper, Total	3,100,000	1,200	14,000,000	194	187	1	0.5%
Lead, Total	400,000	1,300	5,200,000	194	194	6	3.1%
Mercury, Total	23,000	19	51,000	194	121	1	0.5%
Zinc, Total	23,000,000	5,800	45,000,000	194	194	2	1.0%

Table 1. Summary Statistics for Soil Results (Detected Parameters)
Waukegan North Plant MGP Site

Parameter	RAF Screening Levels (µg/kg)	Minimum Conc. (µg/kg)	Maximum Conc. (µg/kg)	Number of Analyzed Samples	Samples Exceeding the MDL	Samples (& %) Exceeding the RAF Screening Levels	
Parameters Detected but Below the Risk Assessment Framework Screening Levels							
Volatile Organic Compounds (VOCs)							
Acetone	61,000,000	5.4	20,000	209	48	0	---
Carbon disulfide	820,000	6.6	52,000	209	13	0	---
cis-1,2-Dichloroethene	NS	6.7	6.7	209	1	0	---
Methyl Ethyl Keytone (MEK)	NS	7.8	45	209	7	0	---
Styrene	6,300,000	520	770,000	209	11	0	---
Toluene	5,000,000	6.2	2,100,000	209	78	0	---
Semi-Volatile Organic Compounds (SVOCs)							
2,4-Dimethylphenol	NS	1,400	1,200,000	209	4	0	---
2-Methylphenol	3,100,000	2,300	690,000	209	6	0	---
4-Methylphenol	NS	590	1,900,000	209	8	0	---
Acenaphthene	3,400,000	30	2,100,000	209	108	0	---
Acenaphthylene	3,400,000	23	2,600,000	209	137	0	---
Anthracene	17,000,000	43	1,600,000	209	145	0	---
Benzo(ghi)perylene	1,700,000	21	390,000	209	142	0	---
Bis(2-ethylhexyl)phthalate	35,000	230	1,800	209	7	0	---
Fluoranthene	2,300,000	43	2,100,000	209	162	0	---
Fluorene	2,300,000	24	1,600,000	209	126	0	---
Phenanthrene	17,000,000	38	4,700,000	209	172	0	---
Phenol	18,000,000	1,200	410,000	209	5	0	---
Inorganic Compounds/Elements							
Beryllium, Total	160,000	400	23,000	194	113	0	---
Cadmium, Total	70,000	220	24,000	194	51	0	---
Chromium, Total	120,000,000	1,900	99,000	194	194	0	---
Cyanide, Total	1,600,000	410	740,000	194	98	0	---
Nickel, Total	1,500,000	1,700	280,000	194	193	0	---
Selenium, Total	390,000	200	18,000	194	73	0	---
Silver, Total	390,000	340	7,700	194	10	0	---
Thallium, Total	6,300	230	1,400	194	56	0	---

Notes:

1) NS - There is no Risk Assessment Framework Screening Level for this Parameter.

Table 2. Soil Results - Detected Volatile Organic Compounds (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Acetone	Benzene	Carbon disulfide	cis-1,2-Dichloroethene	Ethylbenzene	Methyl Ethyl Keytone (MEK)	Methylene chloride	Styrene	Toluene	Xylenes, Total
Risk Assessment Framework Screening Levels				**61,000,000**	**1,100**	**820,000**	**NS**	**5,400**	**NS**	**11,000**	**6,300,000**	**5,000,000**	**630,000**
SB09-001(4-6)	08/01/02	4	6	18	< 6	< 6	< 6	**< 6**	< 6	< 6	< 6	< 6	< 6
SB11-001(5-7)	08/01/02	5	7	< 5.9	< 5.9	< 5.9	< 5.9	7.0	< 5.9	7.0	< 5.9	10	11
SB11-002(14-16)	08/01/02	14	16	< 24	< 24	< 24	< 24	**< 190**	< 24	< 24	< 24	< 24	360
SB12-001(0-1)	08/01/02	0	1	350	< 9.6	< 9.6	< 9.6	**< 9.6**	23	< 9.6	< 9.6	< 9.6	< 9.6
SB13-001(2-3)	08/01/02	2	3	270	< 7.2	< 7.2	< 7.2	**< 7.2**	< 7.2	< 7.2	< 7.2	< 7.2	< 7.2
SB13-002(4-6)	08/01/02	4	6	17	< 6.5	< 6.5	< 6.5	**< 6.5**	< 6.5	10	< 6.5	< 6.5	< 6.5
SB15-001(10-12)	08/01/02	10	12	< 9900	< 9900	< 9900	< 9900	**49,000**	< 9900	< 9900	< 9900	12,000	430,000
SB24-001(5-7)	08/01/02	5	7	< 5.9	< 5.9	< 5.9	< 5.9	**< 5.9**	< 5.9	< 5.9	< 5.9	10	< 5.9
SB27-001(4-6)	08/01/02	4	6	< 5.8	< 5.8	< 5.8	< 5.8	**< 5.8**	< 5.8	< 5.8	< 5.8	11	< 5.8
SB28-001(0-1)	08/01/02	0	1	< 5.3	< 5.3	< 5.3	< 5.3	**< 5.3**	< 5.3	5.5	< 5.3	< 5.3	< 5.3
SB32-001(8-10)	08/01/02	8	10	< 5.4	11	< 5.4	< 5.4	12	< 5.4	< 5.4	< 5.4	19	160
SB33-001(4-6)	08/01/02	4	6	280	**59,000**	4,000	< 7.8	**45,000**	45	< 7.8	16,000	110,000	**700,000**
SB35-001(22-23)	08/01/02	22	23	< 4.4	**4,500**	< 4.4	< 4.4	**15,000**	< 4.4	< 4.4	< 4.4	4,800	31,000
SB36-001(10-12)	08/01/02	10	12	150	210	15	< 5.9	3,600	< 5.9	< 5.9	< 5.9	500	6,400
SB40-001(8-10)	08/01/02	8	10	< 3000	**5,100**	3,500	< 1100	**28,000**	< 1100	< 1100	11,000	49,000	270,000
SB40-002(22-23)	08/01/02	22	23	20,000	**1,600,000**	17,000	< 5200	**96,000**	< 5200	**17,000**	660,000	1,800,000	**2,000,000**
SB42-001(6-8)	08/01/02	6	8	11,000	**1,500,000**	28,000	< 8800	**130,000**	< 8800	< 8800	770,000	2,100,000	**2,400,000**
SB49-001(10-12)	08/01/02	10	12	< 420	< 110	370	< 110	**25,000**	< 110	380	< 110	130	15,000
SP100-001(2-3)	08/01/02	2	3	< 7.9	< 7.9	< 7.9	< 7.9	**< 7.9**	< 7.9	< 7.9	< 7.9	< 7.9	< 7.9
SP100-002(8-10)	08/01/02	8	10	< 5.4	< 5.4	< 5.4	< 5.4	31	< 5.4	< 5.4	< 5.4	< 5.4	9.6
SP100-003(6-8)	08/01/02	6	8	< 8.2	23	< 8.2	< 8.2	**< 8.2**	< 8.2	< 8.2	< 8.2	< 8.2	19
SP101-001(1-2)	08/01/02	1	2	< 100	< 26	< 100	< 100	**< 26**	< 100	< 100	< 100	< 26	< 79
SP101-002(5-7)	08/01/02	5	7	6.8	< 6.7	< 6.7	< 6.7	**< 6.7**	< 6.7	< 6.7	< 6.7	6.7	< 6.7
SP102-001(2-3)	08/01/02	2	3	< 5.6	< 5.6	< 5.6	< 5.6	**< 5.6**	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6
SP102-002(8-10)	08/01/02	8	10	< 5.8	< 5.8	< 5.8	< 5.8	**< 5.8**	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8
SP102-003(14-16)	08/01/02	14	16	< 6.2	< 6.2	< 6.2	< 6.2	**< 6.2**	< 6.2	< 6.2	< 6.2	< 6.2	< 6.2
SP103-001(1-2)	08/01/02	1	2	< 5.5	< 5.5	< 5.5	< 5.5	**< 5.5**	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
SP103-002(6-8)	08/01/02	6	8	< 120	240	< 120	< 120	530	< 120	< 120	< 120	94	1,400
SP103-003(24-25)	08/01/02	24	25	< 6.2	< 6.2	< 6.2	< 6.2	**< 6.2**	< 6.2	< 6.2	< 6.2	< 6.2	< 6.2
SP104-001(2-3)	08/01/02	2	3	< 5.7	< 5.7	< 5.7	< 5.7	**< 5.7**	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7
SP104-002(8-10)	08/01/02	8	10	< 1100	**10,000**	< 1100	< 1100	**150,000**	< 1100	< 1100	< 1100	3,300	110,000
SP104-003(19-20)	08/01/02	19	20	< 110	96	< 110	< 110	89	< 110	310	< 110	< 27	< 81
SP106-001(2-3)	08/01/02	2	3	< 200	150	< 200	< 200	1,500	< 200	< 200	< 200	63	2,600
SP106-002(6-8)	08/01/02	6	8	2,400	**1,300**	< 2200	< 2200	**11,000**	< 2200	< 2200	< 2200	< 540	4,400
SP106-003(19-20)	08/01/02	19	20	< 15000	< 3800	< 15000	< 15000	**280,000**	< 15000	**17,000**	< 15000	< 3800	200,000
SP107-001(0-1)	08/01/02	0	1	67	17	< 9.4	< 9.4	**< 9.4**	< 9.4	< 9.4	< 9.4	10	< 9.4
SP107-002(5-7)	08/01/02	5	7	< 3000	< 750	< 3000	< 3000	**17,000**	< 3000	< 3000	< 3000	< 750	9,300
SB108-001(0-1)	08/01/02	0	1	40	< 7.7	< 7.7	< 7.7	**< 7.7**	< 7.7	< 7.7	< 7.7	< 7.7	< 7.7
SB108-002(4-6)	08/01/02	4	6	< 18000	< 4600	< 18000	< 18000	**36,000**	< 18000	< 18000	< 18000	< 4600	16,000
SB108-003(11-12)	08/01/02	11	12	190	< 5.6	< 5.6	< 5.6	**< 5.6**	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6
SB109-001(1-2)	08/01/02	1	2	< 6.3	< 6.3	< 6.3	< 6.3	**< 6.3**	< 6.3	< 6.3	< 6.3	< 6.3	< 6.3
SB109-002(3-4)	08/01/02	3	4	< 11000	**5,100**	< 11000	< 11000	**29,000**	< 11000	< 11000	< 11000	18,000	94,000
SP110-001(2-3)	08/01/02	2	3	< 6.8	< 6.8	< 6.8	< 6.8	**< 6.8**	< 6.8	< 6.8	< 6.8	< 6.8	< 6.8
SP110-002(6-8)	08/01/02	6	8	< 5.7	< 5.7	< 5.7	< 5.7	**< 5.7**	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7
SP110-003(14-16)	08/01/02	14	16	< 5.6	< 5.6	< 5.6	7	**< 5.6**	< 5.6	< 5.6	< 5.6	6.2	< 5.6
SP111B-001(0-1)	08/01/02	0	1	82	< 5.5	9.4	< 5.5	**< 5.5**	7.8	< 5.5	< 5.5	< 5.5	< 5.5
SP111B-002(8-10)	08/01/02	8	10	< 220	290	< 220	< 220	1,900	< 220	< 220	< 220	< 55	1,900
SP112-001(0-1)	08/01/02	0	1	< 9.7	< 9.7	< 9.7	< 9.7	**< 9.7**	< 9.7	< 9.7	< 9.7	< 9.7	< 9.7
SP112-002(6-8)	08/01/02	6	8	< 110	**1,100**	< 110	< 110	1,800	< 110	< 110	520	2,800	2,000
SB113-001(0-1)	08/01/02	0	1	54	10	< 7.4	< 7.4	**< 7.4**	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4
SB113-002(5-6)	08/01/02	5	6	< 170	**4,800**	< 170	< 170	**28,000**	< 170	200	< 170	1,200	7,800
SB113-003(24-25)	08/01/02	24	25	< 5.3	< 5.3	< 5.3	< 5.3	**< 5.3**	< 5.3	< 5.3	< 5.3	< 5.3	< 5.3
SB114-001(1-2)	08/01/02	1	2	15	< 9.7	< 9.7	< 9.7	**< 9.7**	< 9.7	< 9.7	< 9.7	< 9.7	< 9.7
SB114-002(8-10)	08/01/02	8	10	< 11000	< 2700	< 11000	< 11000	**50,000**	< 11000	**11,000**	< 11000	< 2700	31,000
SP115-001(2-3)	08/01/02	2	3	< 330	**2,500**	< 330	< 330	**160,000**	< 330	< 330	< 330	1,700	97,000
SP115-002(8-10)	08/01/02	8	10	< 230	**7,100**	< 230	< 230	**140,000**	< 230	< 230	< 230	820	110,000
SP115-003(12-14)	08/01/02	12	14	< 250	**52,000**	< 250	< 250	**340,000**	< 250	< 250	< 250	2,000	290,000
SP115-004(17-19)	08/01/02	17	19	< 120	110	< 120	< 120	1,800	< 120	< 120	< 120	< 29	850
SB116-001(1-2)	08/01/02	1	2	< 320	**5,500**	< 320	< 320	**81,000**	< 320	< 320	< 320	590	53,000
SB116-002(7-8)	08/01/02	7	8	< 120	**3,200**	< 120	< 120	**52,000**	< 120	< 120	< 120	220	43,000
SP117-001(1-2)	08/01/02	1	2	< 310	**16,000**	< 310	< 310	**47,000**	< 310	< 310	55,000	45,000	150,000
SP117-002(6-8)	08/01/02	6	8	< 150	220	< 150	< 150	**62,000**	< 150	< 150	< 150	590	47,000
SP118-001(2-3)	08/01/02	2	3	< 9.7	< 9.7	< 9.7	< 9.7	**< 9.7**	< 9.7	< 9.7	< 9.7	< 9.7	< 9.7
SP118-002(6-8)	08/01/02	6	8	< 240	< 60	< 240	< 240	**< 60**	< 240	< 240	< 240	< 60	190
SB119-001(2-3)	08/01/02	2	3	< 140	150	< 140	< 140	**< 34**	< 140	< 140	< 140	250	140
SB119-002(3-4)	08/01/02	3	4	190	< 6.6	< 6.6	< 6.6	**< 6.6**	< 6.6	< 6.6	< 6.6	7.2	< 6.6
SB120-001(1-2)	08/01/02	1	2	< 10	< 10	< 10	< 10	**< 10**	< 10	< 10	< 10	< 10	< 10
SB120-002(5-6)	08/01/02	5	6	< 9.2	< 9.2	< 9.2	< 9.2	**< 9.2**	< 9.2	< 9.2	< 9.2	< 9.2	< 9.2
SB121-001(1-2)	08/01/02	1	2	< 12	< 12	< 12	< 12	**< 12**	< 12	< 12	< 12	< 12	< 12
SB121-002(6-7)	08/01/02	6	7	< 6.6	7.1	< 6.6	< 6.6	**< 6.6**	< 6.6	< 6.6	< 6.6	15	11
SB121-003(20-20.5)	08/01/02	20	20.5	< 6.3	< 6.3	< 6.3	< 6.3	**< 6.3**	< 6.3	< 6.3	< 6.3	< 6.3	< 6.3
SP122-001(2-3)	08/01/02	2	3	< 8	< 8	< 8	< 8	**< 8**	< 8	< 8	< 8	< 8	< 8
SP122-002(8-10)	08/01/02	8	10	< 5.8	< 5.8	< 5.8	< 5.8	**< 5.8**	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8
SP122-003(24-25)	08/01/02	24	25	< 4.4	< 4.4	< 4.4	< 4.4	**< 4.4**	< 4.4	< 4.4	< 4.4	< 4.4	< 4.4
SB123-001(2-3)	08/01/02	2	3	< 4.7	< 4.7	< 4.7	< 4.7	**< 4.7**	< 4.7	< 4.7	< 4.7	< 4.7	< 4.7
SB123-002(8-10)	08/01/02	8	10	65	< 6	< 6	< 6	**< 6**	< 6	< 6	< 6	9.2	< 6
SP124-001(1-2)	08/01/02	1	2	130	15	< 9.9	< 9.9	**< 9.9**	13	< 9.9	< 9.9	< 9.9	< 9.9
SP124-002(4-6)	08/01/02	4	6	< 3000	**29,000**	< 3000	< 3000	**120,000**	< 3000	< 3000	< 3000	33,000	120,000
SP124-003(26-27)	08/01/02	26	27	< 4.4	< 4.4	< 4.4	< 4.4	**< 4.4**	< 4.4	< 4.4	< 4.4	< 4.4	< 4.4
SP126-001(0-1)	08/01/02	0	1	< 5.2	< 5.2	< 5.2	< 5.2	**< 5.2**	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2
SP126-002(5-6)	08/01/02	5	6	< 840	**44,000**	< 840	< 840	**320,000**	< 840	< 840	< 840	20,000	210,000
SP127-001(0-1)	08/01/02	0	1	< 200	**2,100**	< 200	< 200	1,400	< 200	< 200	< 200	1,800	2,100
SP127-002(5-7)	08/01/02	5	7	< 1400	**89,000**	< 1400	< 1400	**380,000**	< 1400	< 1400	< 1400	260,000	400,000
SP128-001(1-2)	08/01/02	1	2	< 120	470	< 120	< 120	1,700	< 120	< 120	< 120	930	1,900
SP128-002(8-10)	08/01/02	8	10	< 5.9	< 5.9	< 5.9	< 5.9	**< 5.9**	< 5.9	< 5.9	< 5.9	9.7	< 5.9
SB130-001(1-2)	08/01/02	1	2	< 150	61	< 150	< 150	590	< 150	< 150	< 150	71	1,200
SB130-002(5-6)	08/01/02	5	6	< 5.6	< 5.6	< 5.6	< 5.6	**< 5.6**	< 5.6	< 5.6	< 5.6	9.0	< 5.6
SP131-001(0-1)	08/01/02	0	1	160	< 7	< 7	< 7	**< 7**	< 7	< 7	< 7	< 7	< 7
SP131-002(6-8)	08/01/02	6	8	13	< 5.8	< 5.8	< 5.8	**< 5.8**	< 5.8	< 5.8	< 5.8	11	< 5.8

Table 2. Soil Results - Detected Volatile Organic Compounds (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Acetone	Benzene	Carbon disulfide	cis-1,2-Dichloroethene	Ethylbenzene	Methyl Ethyl Keytone (MEK)	Methylene chloride	Styrene	Toluene	Xylenes, Total
Risk Assessment Framework Screening Levels				**61,000,000**	**1,100**	**820,000**	**NS**	**5,400**	**NS**	**11,000**	**6,300,000**	**5,000,000**	**630,000**
SB132-001(0-1)	08/01/02	0	1	96	< 5.8	< 5.8	< 5.8	**< 5.8**	13	< 5.8	< 5.8	< 5.8	< 5.8
SB132-002(7-8)	08/01/02	7	8	< 5.8	< 5.8	< 5.8	< 5.8	**< 5.8**	< 5.8	< 5.8	< 5.8	13	10
SP133-001(0-1)	08/01/02	0	1	< 8.3	< 8.3	< 8.3	< 8.3	**< 8.3**	< 8.3	< 8.3	< 8.3	< 8.3	< 8.3
SP133-002(4-6)	08/01/02	4	6	< 5.4	< 5.4	< 5.4	< 5.4	**< 5.4**	< 5.4	< 5.4	< 5.4	< 5.4	< 5.4
SP133-003(24-25)	08/01/02	24	25	< 2100	**20,000**	< 2100	< 2100	**370,000**	< 2100	< 2100	< 2100	98,000	240,000
SP133-004(26-28)	08/01/02	26	28	< 4	< 4	< 4	< 4	**< 4**	< 4	< 4	< 4	< 4	< 4
SP134-001(1-2)	08/01/02	1	2	< 6	< 6	< 6	< 6	**< 6**	< 6	< 6	< 6	< 6	< 6
SP134-002(5-6)	08/01/02	5	6	< 460	**63,000**	< 460	< 460	**360,000**	< 460	< 460	< 460	24,000	250,000
SP135-001(0-1)	08/01/02	0	1	100	< 14	< 14	< 14	46	< 14	< 14	< 14	21	41
SP135-002(8-10)	08/01/02	8	10	< 10000	**140,000**	< 10000	< 10000	**470,000**	< 10000	< 10000	< 10000	300,000	370,000
SP135-003(15-16)	08/01/02	15	16	< 110	37	< 110	< 110	2,000	< 110	< 110	< 110	32	860
SP136-001(2-3)	08/01/02	2	3	230	210	< 190	< 190	470	< 190	500	< 190	81	830
SP136-002(4-6)	08/01/02	4	6	< 1400	**79,000**	< 1400	< 1400	**280,000**	< 1400	< 1400	< 1400	76,000	180,000
SP136-003(29-30)	08/01/02	29	30	< 5.4	< 5.4	< 5.4	< 5.4	**< 5.4**	< 5.4	< 5.4	< 5.4	< 5.4	< 5.4
SB137-001(0-1)	08/01/02	0	1	< 7.1	< 7.1	< 7.1	< 7.1	**< 7.1**	< 7.1	< 7.1	< 7.1	< 7.1	< 7.1
SB137-002(5.5-8)	08/01/02	5.5	8	< 24000	**35,000**	< 24000	< 24000	**310,000**	< 24000	< 24000	< 24000	< 6100	230,000
SB137-003(26-27)	08/01/02	26	27	5.4	< 4.5	< 4.5	< 4.5	**< 4.5**	< 4.5	< 4.5	< 4.5	< 4.5	< 4.5
SP138-001(2-3)	08/01/02	2	3	< 9.2	< 9.2	< 9.2	< 9.2	**< 9.2**	< 9.2	< 9.2	< 9.2	< 9.2	< 9.2
SP138-002(6-8)	08/01/02	6	8	< 8.1	< 8.1	< 8.1	< 8.1	**< 8.1**	< 8.1	< 8.1	< 8.1	< 8.1	< 8.1
SB139-001(2-3)	08/01/02	2	3	< 260	**8,800**	< 260	< 260	290	< 260	< 260	< 260	4,600	3,700
SB139-002(8-10)	08/01/02	8	10	< 130	89	< 130	< 130	**< 31**	< 130	< 130	< 130	< 31	< 94
SB139-003(16.5-17)	08/01/02	16.5	17	< 120	< 30	< 120	< 120	**7,000**	< 120	< 120	< 120	2,200	19,000
SB139-004(23-24)	08/01/02	23	24	< 1700	**670,000**	< 1700	< 1700	**< 420**	< 1700	< 1700	4,300	200,000	2,300
SB139-005(24-25)	08/01/02	24	25	< 110	**4,600**	< 110	< 110	**< 27**	< 110	< 110	< 110	56	< 80
SP140-001(0-1)	08/01/02	0	1	< 160	< 41	< 160	< 160	**< 41**	< 160	< 160	< 160	< 41	< 120
SP140-002(8-10)	08/01/02	8	10	< 5.8	< 5.8	< 5.8	< 5.8	**< 5.8**	< 5.8	< 5.8	< 5.8	7.6	< 5.8
SP141-001(1-2)	08/01/02	1	2	< 5.1	< 5.1	< 5.1	< 5.1	**< 5.1**	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1
SP141-002(6-8)	08/01/02	6	8	< 5.6	< 5.6	< 5.6	< 5.6	**< 5.6**	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6
SP141-003(18-20)	08/01/02	18	20	< 5.2	< 5.2	< 5.2	< 5.2	**< 5.2**	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2
SB142-001(1-2)	08/01/02	1	2	< 150	< 37	< 150	< 150	**< 37**	< 150	< 150	< 150	< 37	< 110
SB142-002(4-6)	08/01/02	4	6	30	< 6	< 6	< 6	**< 6**	< 6	< 6	< 6	9.0	< 6
SP143-001(1-2)	08/01/02	1	2	< 6.1	< 6.1	< 6.1	< 6.1	**< 6.1**	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1
SP143-002(8-10)	08/01/02	8	10	< 120	70	< 120	< 120	200	< 120	< 120	< 120	< 29	550
SP143-003(23-24)	08/01/02	23	24	< 110000	**280,000**	< 110000	< 110000	**540,000**	< 110000	< 110000	< 110000	320,000	410,000
SP143-004(26-28)	08/01/02	26	28	< 4.6	< 4.6	< 4.6	< 4.6	**< 4.6**	< 4.6	< 4.6	< 4.6	< 4.6	< 4.6
SP144-001(2-3)	08/01/02	2	3	10	14	< 9.5	< 9.5	**< 9.5**	< 9.5	< 9.5	< 9.5	< 9.5	< 9.5
SP144-002(8-10)	08/01/02	8	10	< 110	160	< 110	< 110	390	< 110	< 110	< 110	< 29	200
SP145-001(0-1)	08/01/02	0	1	< 8.9	< 8.9	< 8.9	< 8.9	**< 8.9**	< 8.9	< 8.9	< 8.9	< 8.9	< 8.9
SP145-002(4-6)	08/01/02	4	6	< 11000	**81,000**	< 11000	< 11000	**200,000**	< 11000	< 11000	< 11000	130,000	150,000
SP145-003(23-24)	08/01/02	23	24	< 6.3	< 6.3	< 6.3	< 6.3	**< 6.3**	< 6.3	< 6.3	< 6.3	< 6.3	< 6.3
SP146-001(1-2)	08/01/02	1	2	< 210	620	< 210	< 210	460	< 210	< 210	< 210	2,300	2,800
SP146-002(4-6)	08/01/02	4	6	< 3300	**310,000**	< 3300	< 3300	**840,000**	< 3300	< 3300	20,000	480,000	**770,000**
SP146-004(29-30)	08/01/02	29	30	< 5	< 5	< 5	< 5	**< 5**	< 5	< 5	< 5	< 5	< 5
SP147-001(0-1)	08/01/02	0	1	< 5.4	< 5.4	< 5.4	< 5.4	**< 5.4**	< 5.4	< 5.4	< 5.4	< 5.4	< 5.4
SP147-002(6-8)	08/01/02	6	8	< 8	< 8	< 8	< 8	**< 8**	< 8	< 8	< 8	< 8	< 8
SP147-003(29-30)	08/01/02	29	30	< 4.5	< 4.5	< 4.5	< 4.5	**< 4.5**	< 4.5	< 4.5	< 4.5	< 4.5	< 4.5
SP148-001(1-2)	08/01/02	1	2	34	< 7.9	< 7.9	< 7.9	**< 7.9**	< 7.9	< 7.9	< 7.9	< 7.9	< 7.9
SP148-002(6-8)	08/01/02	6	8	< 5.6	< 5.6	< 5.6	< 5.6	**< 5.6**	< 5.6	< 5.6	< 5.6	7.6	< 5.6
SP149-001(2-3)	08/01/02	2	3	< 10	12	< 10	< 10	**< 10**	< 10	< 10	< 10	< 10	< 10
SP149-002(8-10)	08/01/02	8	10	< 5.8	< 5.8	< 5.8	< 5.8	**< 5.8**	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8
SP150-001(2-3)	08/01/02	2	3	61	42	< 8.6	< 8.6	**< 8.6**	< 8.6	< 8.6	< 8.6	< 8.6	< 8.6
SP150-002(4-6)	08/01/02	4	6	26	< 5.9	< 5.9	< 5.9	**< 5.9**	< 5.9	< 5.9	< 5.9	7.5	< 5.9
SP151-001(0-1)	08/01/02	0	1	< 6.1	< 6.1	< 6.1	< 6.1	**< 6.1**	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1
SP151-002(4-6)	08/01/02	4	6	< 110	59	< 110	< 110	110	< 110	< 110	< 110	99	230
SP151-003(8-10)	08/01/02	8	10	10	< 5.4	< 5.4	< 5.4	**< 5.4**	< 5.4	< 5.4	< 5.4	8.3	< 5.4
SP152-001(1-2)	08/01/02	1	2	76	6.7	< 6.3	< 6.3	**< 6.3**	< 6.3	< 6.3	< 6.3	< 6.3	< 6.3
SP152-002(4-6)	08/01/02	4	6	< 120	76	< 120	< 120	**< 31**	< 120	< 120	< 120	< 31	< 92
SP154-001(2-3)	08/01/02	2	3	< 290	310	< 290	< 290	**< 73**	< 290	< 290	< 290	240	< 220
SP154-002(4-6)	08/01/02	4	6	< 260	**4,800**	< 260	< 260	**< 66**	< 260	< 260	< 260	1,900	650
SP154-003(10-12)	08/01/02	10	12	< 5.5	< 5.5	< 5.5	< 5.5	**< 5.5**	< 5.5	< 5.5	< 5.5	< 5.5	< 5.5
SP155-001(2-3)	08/01/02	2	3	< 5.4	< 5.4	< 5.4	< 5.4	**< 5.4**	< 5.4	< 5.4	< 5.4	< 5.4	< 5.4
SP155-002(4-6)	08/01/02	4	6	< 170	100	< 170	< 170	76	< 170	< 170	< 170	200	530
SP156-001(0-1)	08/01/02	0	1	< 12	< 12	< 12	< 12	**< 12**	< 12	< 12	< 12	< 12	< 12
SP156-002(8-10)	08/01/02	8	10	< 2400	**50,000**	< 2400	< 2400	**420,000**	< 2400	< 2400	< 2400	71,000	260,000
SP156-003(25-26)	08/01/02	25	26	< 5.2	< 5.2	< 5.2	< 5.2	**< 5.2**	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2
SP157-001(0-1)	08/01/02	0	1	< 5.4	< 5.4	< 5.4	< 5.4	**< 5.4**	< 5.4	< 5.4	< 5.4	< 5.4	< 5.4
SP157-002(8-10)	08/01/02	8	10	< 30000	**9,000**	52,000	< 30000	**22,000**	< 30000	< 30000	< 30000	16,000	520,000
SP158-001(0-1)	08/01/02	0	1	< 5.2	< 5.2	< 5.2	< 5.2	**< 5.2**	< 5.2	< 5.2	< 5.2	< 5.2	< 5.2
SP158-002(6-8)	08/01/02	6	8	< 220	170	< 220	< 220	1,600	< 220	< 220	< 220	< 56	810
SB159-001(1-2)	08/01/02	1	2	34	< 9	< 9	< 9	**< 9**	< 9	< 9	< 9	< 9	< 9
SB159-002(6-7)	08/01/02	6	7	< 6	< 6	< 6	< 6	**< 6**	< 6	< 6	< 6	< 6	< 6
SB159-003(19-20)	08/01/02	19	20	< 4.7	< 4.7	< 4.7	< 4.7	**< 4.7**	< 4.7	< 4.7	< 4.7	< 4.7	< 4.7
SB160-001(1-2)	08/01/02	1	2	99	< 7	< 7	< 7	**< 7**	< 7	< 7	< 7	< 7	< 7
SB160-002(5-6)	08/01/02	5	6	100	< 8.1	< 8.1	< 8.1	**< 8.1**	< 8.1	< 8.1	< 8.1	9.5	< 8.1
SB161-001(1-2)	08/01/02	1	2	< 4.6	< 4.6	< 4.6	< 4.6	**< 4.6**	< 4.6	< 4.6	< 4.6	< 4.6	< 4.6
SB161-002(8-10)	08/01/02	8	10	< 6.3	< 6.3	< 6.3	< 6.3	**< 6.3**	< 6.3	< 6.3	< 6.3	< 6.3	< 6.3
SB161-003(12-14)	08/01/02	12	14	20	< 6.1	< 6.1	< 6.1	**< 6.1**	< 6.1	< 6.1	< 6.1	7.6	< 6.1
SP162-001(2-3)	08/01/02	2	3	< 5.1	< 5.1	< 5.1	< 5.1	**< 5.1**	< 5.1	< 5.1	< 5.1	< 5.1	< 5.1
SP162-002(6-8)	08/01/02	6	8	< 31000	**23,000**	< 31000	< 31000	**26,000**	< 31000	< 31000	49,000	100,000	**800,000**
SP163-001(1-2)	08/01/02	1	2	< 12	< 12	< 12	< 12	**< 12**	< 12	< 12	< 12	< 12	< 12
SP163-002(3-5)	08/01/02	3	5	< 1700	**1,700**	< 1700	< 1700	**450,000**	< 1700	< 1700	< 1700	12,000	**1,900,000**
SP163-003(22-24)	08/01/02	22	24	< 5.7	< 5.7	< 5.7	< 5.7	9	< 5.7	< 5.7	< 5.7	< 5.7	10
SP164-001(2-3)	08/01/02	2	3	110	< 11	< 11	< 11	**< 11**	< 11	< 11	< 11	< 11	< 11
SP164-002(3-5)	08/01/02	3	5	89	< 8.3	25	< 8.3	**< 8.3**	13	< 8.3	< 8.3	< 8.3	< 8.3
SP165-001(0-1)	08/01/02	0	1	< 5.7	< 5.7	< 5.7	< 5.7	**< 5.7**	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7
SB166-001(22.5-23.5)	08/01/02	22.5	23.5	< 220	100	< 220	< 220	**47,000**	< 220	< 220	21,000	37,000	180,000
SB166-002(25-26)	08/01/02	25	26	< 4.6	< 4.6	< 4.6	< 4.6	**< 4.6**	< 4.6	< 4.6	< 4.6	< 4.6	< 4.6
SB167-001(0-1)	08/01/02	0	1	< 6	< 6	< 6	< 6	**< 6**	< 6	< 6	< 6	< 6	< 6
SB167-002(5-6)	08/01/02	5	6	< 7600	**99,000**	< 7600	< 7600	**330,000**	< 7600	< 7600	19,000	430,000	**890,000**

Table 2. Soil Results - Detected Volatile Organic Compounds (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Acetone	Benzene	Carbon disulfide	cis-1,2-Dichloroethene	Ethylbenzene	Methyl Ethyl Keytone (MEK)	Methylene chloride	Styrene	Toluene	Xylenes, Total
Risk Assessment Framework Screening Levels				**61,000,000**	**1,100**	**820,000**	**NS**	**5,400**	**NS**	**11,000**	**6,300,000**	**5,000,000**	**630,000**
SP168-001(0-1)	08/01/02	0	1	< 6.5	< 6.5	< 6.5	< 6.5	**< 6.5**	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
SP168-002(3-5)	08/01/02	3	5	< 5.4	< 5.4	< 5.4	< 5.4	**< 5.4**	< 5.4	< 5.4	< 5.4	< 5.4	< 5.4
SB169-001(0-2)	08/01/02	0	2	< 7.7	< 7.7	< 7.7	< 7.7	**< 7.7**	< 7.7	< 7.7	< 7.7	< 7.7	< 7.7
SB169-002(8-9)	08/01/02	8	9	< 6.4	< 6.4	< 6.4	< 6.4	**< 6.4**	< 6.4	< 6.4	< 6.4	< 6.4	< 6.4
SB170-001(0-1)	08/01/02	0	1	< 7.4	< 7.4	< 7.4	< 7.4	**< 7.4**	< 7.4	< 7.4	< 7.4	< 7.4	< 7.4
SB170-002(4-6)	08/01/02	4	6	< 6.9	< 6.9	< 6.9	< 6.9	**< 6.9**	< 6.9	< 6.9	< 6.9	< 6.9	< 6.9
SB170-003(20-21)	08/01/02	20	21	< 4.3	< 4.3	< 4.3	< 4.3	**< 4.3**	< 4.3	< 4.3	< 4.3	< 4.3	< 4.3
SB171-001(2-3)	08/01/02	2	3	47	< 13	< 13	< 13	**< 13**	< 13	< 13	< 13	< 13	< 13
SB171-002(6-7)	08/01/02	6	7	88	< 11	31	< 11	**< 11**	< 11	< 11	< 11	< 11	< 11
SP172-001(2-3)	08/01/02	2	3	110	11	< 10	< 10	**< 10**	< 10	< 10	< 10	< 10	< 10
SP172-002(8-10)	08/01/02	8	10	< 130	540	< 130	< 130	2,900	< 130	< 130	< 130	760	920
SP173-001(0-1)	08/01/02	0	1	< 11	< 11	< 11	< 11	**< 11**	< 11	< 11	< 11	< 11	< 11
SP173-002(4-6)	08/01/02	4	6	120	< 8.1	8.7	< 8.1	27	22	< 8.1	< 8.1	9.1	78
SP173-003(8-10)	08/01/02	8	10	< 5.6	< 5.6	< 5.6	< 5.6	**< 5.6**	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6
SP174-001(1-2)	08/01/02	1	2	< 5.6	< 5.6	< 5.6	< 5.6	**< 5.6**	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6
SP174-002(6-8)	08/01/02	6	8	7.1	< 5.3	< 5.3	< 5.3	**< 5.3**	< 5.3	< 5.3	< 5.3	9.3	< 5.3
SB175-001(1-2)	08/01/02	1	2	< 13	< 13	< 13	< 13	**< 13**	< 13	< 13	< 13	< 13	< 13
SB175-002(7-8)	08/01/02	7	8	11	< 6.2	< 6.2	< 6.2	**< 6.2**	< 6.2	< 6.2	< 6.2	11	< 6.2
SB175-003(22-23)	08/01/02	22	23	< 4.8	< 4.8	< 4.8	< 4.8	**< 4.8**	< 4.8	< 4.8	< 4.8	< 4.8	< 4.8
SB176-001(2-3)	08/01/02	2	3	10	< 5	< 5	< 5	**< 5**	< 5	< 5	< 5	< 5	< 5
SB176-002(6-7)	08/01/02	6	7	83	< 6.6	29	< 6.6	**< 6.6**	< 6.6	< 6.6	< 6.6	< 6.6	< 6.6
SB177-001(0-1)	08/01/02	0	1	< 5.8	< 5.8	< 5.8	< 5.8	**< 5.8**	< 5.8	< 5.8	< 5.8	< 5.8	< 5.8
SB177-002(7-8)	08/01/02	7	8	< 6	< 6	< 6	< 6	**< 6**	< 6	< 6	< 6	< 6	< 6
SB177-003(19-20)	08/01/02	19	20	< 5.7	< 5.7	< 5.7	< 5.7	**< 5.7**	< 5.7	< 5.7	< 5.7	< 5.7	< 5.7
SB178-001(0-1)	08/01/02	0	1	< 6.4	< 6.4	6.6	< 6.4	**< 6.4**	< 6.4	< 6.4	< 6.4	< 6.4	< 6.4
SB178-002(5-6)	08/01/02	5	6	100	< 29	< 29	< 29	**< 29**	< 29	< 29	< 29	< 29	< 29
SP179-001(1-2)	08/01/02	1	2	< 4.5	< 4.5	< 4.5	< 4.5	**< 4.5**	< 4.5	< 4.5	< 4.5	< 4.5	< 4.5
SP179-002(6-8)	08/01/02	6	8	< 5.6	< 5.6	< 5.6	< 5.6	**< 5.6**	< 5.6	< 5.6	< 5.6	< 5.6	< 5.6
SP180-001(2-3)	08/01/02	2	3	< 6.5	< 6.5	< 6.5	< 6.5	**< 6.5**	< 6.5	< 6.5	< 6.5	< 6.5	< 6.5
SP180-002(3-5)	08/01/02	3	5	10	< 6.3	< 6.3	< 6.3	**< 6.3**	< 6.3	< 6.3	< 6.3	< 6.3	< 6.3
SP180-003(10-12)	08/01/02	10	12	< 6.1	23	< 6.1	< 6.1	**< 6.1**	< 6.1	< 6.1	< 6.1	< 6.1	< 6.1

Notes:
1) The Risk Assessment Framework Screening Levels are a hierarchical combination of USEPA Regional Screening Levels (RSLs) and Illinois TACO Tier I values.

Table 3. Soil Results - Detected Polynuclear Aromatic Hydrocarbons (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
Risk Assessment Framework Screening Levels				**3,400,000**	**3,400,000**	**17,000,000**	**150**	**15**	**150**	**1,700,000**	**1,500**	**15,000**	**15**	**2,300,000**	**2,300,000**	**150**	**310,000**	**3,600**	**17,000,000**	**1,700,000**
SB09-001(4-6)	08/01/02	4	6	< 20	68	110	**390**	**450**	**420**	130	290	340	**76**	580	24	**200**	< 20	43	340	570
SB11-001(5-7)	08/01/02	5	7	32	23	54	68	**62**	51	40	41	79	**34**	130	< 22	55	< 22	150	42	200
SB11-002(14-16)	08/01/02	14	16	400	270	640	**310**	**230**	**190**	62	120	280	**35**	770	610	95	20,000	**50,000**	1,900	750
SB12-001(0-1)	08/01/02	0	1	30	120	86	**410**	**340**	**590**	190	340	530	**120**	660	63	**330**	50	140	520	640
SB13-001(2-3)	08/01/02	2	3	33	200	230	**1,300**	**1,100**	**2,300**	460	**1,700**	1,300	**380**	1,800	77	**870**	86	230	1,100	1,900
SB13-002(4-6)	08/01/02	4	6	< 23	< 23	< 23	< 23	< 23	< 23	< 23	< 23	< 23	< 23	< 23	< 23	34	< 23	**< 23**	< 23	< 23
SB15-001(10-12)	08/01/02	10	12	7,300	8,800	57,000	**25,000**	**18,000**	**13,000**	5,900	**12,000**	**19,000**	**4,300**	74,000	49,000	**8,200**	73,000	**810,000**	110,000	39,000
SB24-001(5-7)	08/01/02	5	7	< 20	28	< 20	< 20	**36**	26	21	33	< 20	< 20	< 20	< 20	38	< 20	33	< 20	< 20
SB27-001(4-6)	08/01/02	4	6	< 21	< 21	< 21	< 21	< 21	< 21	22	23	< 21	< 21	< 21	< 21	36	< 21	35	< 21	< 21
SB28-001(0-1)	08/01/02	0	1	< 17	250	59	**170**	**460**	**300**	240	230	210	**99**	270	29	**310**	< 17	36	160	260
SB32-001(8-10)	08/01/02	8	10	31,000	61,000	72,000	**54,000**	**54,000**	**39,000**	14,000	**35,000**	**43,000**	**3,800**	140,000	65,000	**23,000**	60,000	**120,000**	210,000	97,000
SB33-001(4-6)	08/01/02	4	6	57,000	100,000	180,000	**170,000**	**100,000**	**110,000**	24,000	**85,000**	**170,000**	**13,000**	240,000	310,000	**41,000**	**6,100,000**	**13,000,000**	1,200,000	390,000
SB35-001(22-23)	08/01/02	22	23	22,000	43,000	48,000	**36,000**	**21,000**	**20,000**	6,800	**15,000**	**24,000**	**4,000**	92,000	54,000	**6,900**	80,000	**250,000**	150,000	56,000
SB36-001(10-12)	08/01/02	10	12	27,000	65,000	180,000	**120,000**	**110,000**	**81,000**	28,000	**72,000**	**90,000**	**9,000**	310,000	130,000	**46,000**	1,100	**6,800**	440,000	190,000
SB40-001(8-10)	08/01/02	8	10	38,000	1,300,000	1,300,000	**600,000**	**400,000**	**300,000**	38,000	**360,000**	**510,000**	**27,000**	1,500,000	1,300,000	**130,000**	**2,000,000**	**6,100,000**	2,800,000	1,200,000
SB40-002(22-23)	08/01/02	22	23	48,000	1,500,000	1,200,000	**750,000**	**530,000**	**450,000**	170,000	**400,000**	**730,000**	**32,000**	1,800,000	1,400,000	**180,000**	**2,200,000**	**9,900,000**	3,100,000	1,500,000
SB42-001(6-8)	08/01/02	6	8	160,000	1,900,000	1,600,000	**960,000**	**540,000**	**440,000**	160,000	**420,000**	**840,000**	**44,000**	2,100,000	1,500,000	**190,000**	**3,300,000**	**11,000,000**	3,900,000	1,300,000
SB49-001(10-12)	08/01/02	10	12	300,000	26,000	140,000	**62,000**	**63,000**	**40,000**	26,000	**32,000**	**62,000**	**1,400**	110,000	170,000	**19,000**	190,000	**590,000**	390,000	280,000
SP100-001(2-3)	08/01/02	2	3	52	710	420	**1,900**	**1,600**	**1,500**	820	430	1,700	**120**	2,200	130	**740**	43	62	1,100	2,700
SP100-002(8-10)	08/01/02	8	10	60	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	550	< 40	< 40
SP100-003(6-8)	08/01/02	6	8	630	2,100	3,100	**8,200**	**6,400**	**3,000**	2,000	1,200	9,000	**450**	12,000	2,100	**1,400**	1,600	1,800	19,000	19,000
SP101-001(1-2)	08/01/02	1	2	< 37	390	480	**1,100**	**780**	**660**	370	630	940	< 37	1,200	160	**310**	200	240	980	1,300
SP101-002(5-7)	08/01/02	5	7	1,700	< 190	< 190	**220**	< 190	< 190	< 190	< 190	320	< 190	< 190	610	< 190	< 190	350	410	330
SP102-001(2-3)	08/01/02	2	3	< 37	54	< 37	60	**83**	81	81	58	66	< 37	70	< 37	48	< 37	47	78	110
SP102-002(8-10)	08/01/02	8	10	720	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	170	< 40	< 40	**< 40**	< 40	< 40
SP102-003(14-16)	08/01/02	14	16	330	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	**< 42**	< 42	< 42
SP103-001(1-2)	08/01/02	1	2	410	4,700	1,900	**6,700**	**8,000**	**5,100**	5,000	**4,900**	7,000	**580**	7,200	880	**3,600**	740	1,300	4,400	12,000
SP103-002(6-8)	08/01/02	6	8	44,000	5,200	23,000	**16,000**	**9,500**	**8,600**	3,800	**3,400**	**17,000**	**600**	28,000	20,000	**2,800**	1,700	3,500	70,000	39,000
SP103-003(24-25)	08/01/02	24	25	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	**< 41**	< 41	< 41
SP104-001(2-3)	08/01/02	2	3	9,000	8,400	15,000	**51,000**	**54,000**	**38,000**	27,000	**25,000**	**49,000**	**9,300**	58,000	7,900	**21,000**	5,100	**9,400**	50,000	100,000
SP104-002(8-10)	08/01/02	8	10	790,000	34,000	240,000	**120,000**	**120,000**	**78,000**	50,000	**37,000**	**160,000**	**13,000**	210,000	220,000	**35,000**	**1,500,000**	**2,600,000**	1,100,000	480,000
SP104-003(19-20)	08/01/02	19	20	4,100	< 39	160	96	**75**	51	< 39	< 39	90	< 39	130	420	< 39	1,100	1,100	550	200
SP106-001(2-3)	08/01/02	2	3	110,000	7,100	29,000	**26,000**	**8,700**	**6,900**	3,000	**4,900**	**29,000**	< 2200	57,000	39,000	**2,400**	< 2200	**9,000**	47,000	75,000
SP106-002(6-8)	08/01/02	6	8	440,000	19,000	170,000	**89,000**	**60,000**	**41,000**	22,000	**21,000**	**98,000**	**2,900**	140,000	170,000	**17,000**	**450,000**	**1,000,000**	620,000	230,000
SP106-003(19-20)	08/01/02	19	20	980,000	130,000	430,000	**230,000**	**160,000**	**100,000**	60,000	**48,000**	**230,000**	**6,300**	340,000	470,000	**42,000**	**1,600,000**	**2,800,000**	1,500,000	530,000
SP107-001(0-1)	08/01/02	0	1	< 770	1,800	< 770	**910**	**850**	**980**	1,100	< 770	1,800	< 770	960	< 770	< 770	< 770	**< 770**	1,100	2,000
SP107-002(5-7)	08/01/02	5	7	150,000	11,000	62,000	**39,000**	**27,000**	**18,000**	11,000	**8,700**	**37,000**	**670**	53,000	65,000	**7,600**	200,000	**320,000**	210,000	99,000
SB108-001(0-1)	08/01/02	0	1	1,800	13,000	16,000	**38,000**	**27,000**	**22,000**	13,000	**14,000**	**38,000**	**2,100**	50,000	15,000	**10,000**	6,300	1,600	70,000	75,000
SB108-002(4-6)	08/01/02	4	6	890,000	120,000	680,000	**440,000**	**390,000**	**210,000**	120,000	**170,000**	**450,000**	**8,900**	790,000	730,000	**83,000**	**460,000**	**1,400,000**	2,100,000	1,200,000
SB108-003(11-12)	08/01/02	11	12	320	64	100	57	**58**	< 39	< 39	40	85	< 39	120	72	< 39	< 39	**< 39**	210	170
SB109-001(1-2)	08/01/02	1	2	1,300	23,000	12,000	**38,000**	**35,000**	**30,000**	17,000	**12,000**	**46,000**	**2,800**	33,000	5,400	**13,000**	3,100	2,800	32,000	61,000
SB109-002(3-4)	08/01/02	3	4	240,000	94,000	260,000	**110,000**	**73,000**	**38,000**	25,000	**27,000**	**170,000**	**1,800**	240,000	270,000	**21,000**	**710,000**	**1,000,000**	650,000	410,000
SP110-001(2-3)	08/01/02	2	3	110	930	1,900	**4,500**	**3,000**	**3,100**	880	**1,900**	4,100	**210**	6,500	1,100	**900**	110	98	6,800	7,600
SP110-002(6-8)	08/01/02	6	8	250	1,900	3,500	**7,200**	**4,100**	**4,900**	1,800	**3,300**	5,800	**330**	10,000	2,400	**1,800**	340	300	13,000	11,000
SP110-003(14-16)	08/01/02	14	16	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	**< 37**	38	< 37
SP111B-001(0-1)	08/01/02	0	1	870	5,000	4,400	**12,000**	**9,200**	**11,000**	6,100	**3,400**	13,000	**700**	19,000	6,300	**4,600**	3,400	**4,000**	29,000	27,000
SP111B-002(8-10)	08/01/02	8	10	26,000	7,500	30,000	**13,000**	**7,700**	**5,400**	2,200	**2,100**	9,200	**490**	26,000	23,000	**1,500**	1,500	300	86,000	40,000
SP112-001(0-1)	08/01/02	0	1	< 36	91	160	**620**	**450**	**620**	240	240	720	**97**	790	38	**220**	75	66	760	880
SP112-002(6-8)	08/01/02	6	8	6,500	750	2,500	**2,200**	**1,500**	**670**	590	720	2,200	< 200	1,900	2,400	**430**	9,100	1,800	6,000	4,000

Table 3. Soil Results - Detected Polynuclear Aromatic Hydrocarbons (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
Risk Assessment Framework Screening Levels				**3,400,000**	**3,400,000**	**17,000,000**	**150**	**15**	**150**	**1,700,000**	**1,500**	**15,000**	**15**	**2,300,000**	**2,300,000**	**150**	**310,000**	**3,600**	**17,000,000**	**1,700,000**
SB113-001(0-1)	08/01/02	0	1	1,900	2,700	1,900	**4,700**	**4,600**	**4,000**	3,700	**3,600**	5,300	**290**	5,700	1,000	**2,400**	2,400	**4,000**	6,300	9,300
SB113-002(5-6)	08/01/02	5	6	1,000,000	57,000	500,000	**250,000**	**180,000**	**130,000**	71,000	**58,000**	**250,000**	**11,000**	410,000	370,000	**51,000**	120,000	**380,000**	1,500,000	580,000
SB113-003(24-25)	08/01/02	24	25	150	< 36	63	41	< 36	< 36	< 36	< 36	56	< 36	68	67	< 36	190	380	240	100
SB114-001(1-2)	08/01/02	1	2	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	**< 42**	69	48
SB114-002(8-10)	08/01/02	8	10	250,000	19,000	120,000	**58,000**	**42,000**	**27,000**	15,000	**14,000**	**64,000**	**1,300**	90,000	110,000	**12,000**	**500,000**	**890,000**	380,000	140,000
SP115-001(2-3)	08/01/02	2	3	370,000	15,000	150,000	**67,000**	**38,000**	**15,000**	13,000	**25,000**	**84,000**	**2,200**	120,000	160,000	**8,600**	**460,000**	**1,200,000**	450,000	230,000
SP115-002(8-10)	08/01/02	8	10	1,200,000	79,000	700,000	**250,000**	**160,000**	**110,000**	66,000	**76,000**	**320,000**	**5,500**	440,000	480,000	**53,000**	**2,100,000**	**4,300,000**	1,600,000	710,000
SP115-003(12-14)	08/01/02	12	14	810,000	60,000	370,000	**210,000**	**170,000**	**85,000**	60,000	**67,000**	**200,000**	**5,600**	350,000	430,000	**41,000**	**1,400,000**	**3,000,000**	1,200,000	500,000
SP115-004(17-19)	08/01/02	17	19	8,300	150	470	**290**	**240**	**150**	100	95	280	< 42	480	1,100	64	5,300	**24,000**	1,700	750
SB116-001(1-2)	08/01/02	1	2	1,400,000	260,000	890,000	**820,000**	**560,000**	**360,000**	190,000	**270,000**	**800,000**	**20,000**	1,200,000	1,000,000	**140,000**	**1,700,000**	**2,200,000**	2,800,000	**1,800,000**
SB116-002(7-8)	08/01/02	7	8	200,000	16,000	84,000	**53,000**	**28,000**	**15,000**	10,000	**15,000**	**65,000**	**990**	83,000	93,000	**8,800**	290,000	**640,000**	290,000	130,000
SP117-001(1-2)	08/01/02	1	2	63,000	54,000	82,000	**110,000**	**68,000**	**57,000**	31,000	**23,000**	**110,000**	**4,900**	130,000	110,000	**25,000**	180,000	**270,000**	320,000	200,000
SP117-002(6-8)	08/01/02	6	8	710,000	42,000	330,000	**170,000**	**100,000**	**68,000**	37,000	**29,000**	**160,000**	**3,800**	290,000	230,000	**27,000**	**780,000**	**1,600,000**	1,000,000	430,000
SP118-001(2-3)	08/01/02	2	3	< 380	< 380	550	**1,300**	**1,200**	**1,300**	690	1,100	1,500	< 380	1,300	< 380	**590**	1,600	880	2,600	1,200
SP118-002(6-8)	08/01/02	6	8	6,300	380	2,300	**1,800**	**1,300**	**960**	510	430	2,400	< 210	2,200	2,700	**340**	< 210	**< 210**	6,200	4,300
SB119-001(2-3)	08/01/02	2	3	110	1,200	590	**1,500**	**1,100**	**1,100**	830	1,100	3,000	**91**	1,400	150	**680**	450	1,400	1,000	2,500
SB119-002(3-4)	08/01/02	3	4	< 44	56	65	< 44	**44**	< 44	< 44	48	82	< 44	190	< 44	< 44	170	480	280	140
SB120-001(1-2)	08/01/02	1	2	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	58	< 37	43
SB120-002(5-6)	08/01/02	5	6	160	510	430	**460**	**370**	**180**	76	230	820	< 46	960	260	54	170	380	1,100	1,500
SB121-001(1-2)	08/01/02	1	2	< 43	130	80	**370**	**280**	**510**	280	280	540	< 43	450	< 43	**270**	56	110	370	660
SB121-002(6-7)	08/01/02	6	7	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	**< 40**	49	< 40
SB121-003(20-20.5)	08/01/02	20	20.5	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	**< 41**	82	50
SP122-001(2-3)	08/01/02	2	3	< 370	640	1,400	**8,200**	**9,600**	**11,000**	7,900	**4,600**	10,000	**1,900**	14,000	520	**6,500**	< 370	**< 370**	5,200	14,000
SP122-002(8-10)	08/01/02	8	10	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	**< 41**	< 41	< 41
SP122-003(24-25)	08/01/02	24	25	< 37	< 37	< 37	< 37	**41**	< 37	43	< 37	< 37	< 37	< 37	< 37	< 37	< 37	**< 37**	< 37	< 37
SB123-001(2-3)	08/01/02	2	3	< 37	< 37	52	**160**	**180**	**200**	98	96	180	< 37	88	< 37	96	190	110	300	130
SB123-002(8-10)	08/01/02	8	10	62	< 42	50	< 42	**49**	< 42	< 42	< 42	49	< 42	61	44	< 42	58	100	160	100
SP124-001(1-2)	08/01/02	1	2	510	7,000	7,500	**38,000**	**42,000**	**28,000**	30,000	**32,000**	**35,000**	**9,800**	52,000	3,300	**22,000**	1,800	3,000	35,000	95,000
SP124-002(4-6)	08/01/02	4	6	310,000	2,600,000	1,300,000	**530,000**	**550,000**	**260,000**	220,000	**300,000**	**660,000**	**46,000**	1,100,000	1,600,000	**130,000**	**4,400,000**	**9,900,000**	4,700,000	**2,300,000**
SP124-003(26-27)	08/01/02	26	27	1,700	190	770	**650**	**220**	**210**	240	270	590	< 36	900	1,300	**160**	2,200	**3,700**	2,600	1,300
SP126-001(0-1)	08/01/02	0	1	< 75	390	390	**930**	**770**	**790**	460	300	960	**160**	1,500	350	**350**	240	380	2,000	1,900
SP126-002(5-6)	08/01/02	5	6	1,900,000	610,000	1,200,000	**770,000**	**630,000**	**400,000**	220,000	**190,000**	**890,000**	**18,000**	1,200,000	1,300,000	**180,000**	**3,500,000**	**8,000,000**	3,700,000	**1,700,000**
SP127-001(0-1)	08/01/02	0	1	6,600	48,000	25,000	**200,000**	**130,000**	**110,000**	66,000	**83,000**	**260,000**	**9,400**	230,000	< 23000	**50,000**	8,800	**15,000**	37,000	460,000
SP127-002(5-7)	08/01/02	5	7	770,000	630,000	620,000	**500,000**	**440,000**	**290,000**	160,000	**180,000**	**470,000**	**5,500**	740,000	840,000	**54,000**	**2,000,000**	**5,100,000**	2,300,000	1,100,000
SP128-001(1-2)	08/01/02	1	2	1,800	3,600	3,600	**3,300**	**2,700**	**1,900**	1,300	**1,600**	3,700	**420**	5,200	3,800	**990**	9,000	**16,000**	13,000	7,500
SP128-002(8-10)	08/01/02	8	10	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	**< 40**	< 40	< 40
SB130-001(1-2)	08/01/02	1	2	< 35	54	100	**230**	**220**	**250**	130	140	330	**53**	320	< 35	120	420	250	500	310
SB130-002(5-6)	08/01/02	5	6	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	**< 41**	< 41	< 41
SP131-001(0-1)	08/01/02	0	1	< 42	56	43	**190**	**150**	**230**	84	92	260	< 42	290	< 42	78	< 42	**< 42**	190	270
SP131-002(6-8)	08/01/02	6	8	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	**< 39**	< 39	< 39
SB132-001(0-1)	08/01/02	0	1	< 40	430	480	**1,400**	**1,900**	**2,100**	1,400	1,400	1,700	**960**	1,900	< 40	**1,400**	< 40	230	1,500	1,400
SB132-002(7-8)	08/01/02	7	8	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	150	< 40	< 40	< 40	**< 40**	78	98
SP133-001(0-1)	08/01/02	0	1	57	570	610	**2,500**	**1,800**	**2,000**	890	780	2,800	**360**	2,900	230	**750**	180	230	3,800	5,400
SP133-002(4-6)	08/01/02	4	6	< 39	76	160	**350**	**310**	**390**	190	190	370	**75**	560	41	**170**	97	75	610	600
SP133-003(24-25)	08/01/02	24	25	280,000	1,200,000	670,000	**360,000**	**310,000**	**190,000**	66,000	**120,000**	**400,000**	**13,000**	610,000	820,000	**48,000**	**2,200,000**	**5,400,000**	2,100,000	960,000
SP133-004(26-28)	08/01/02	26	28	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	65	< 37	< 37
SP134-001(1-2)	08/01/02	1	2	< 220	520	860	**3,000**	**2,600**	**2,800**	1,800	**1,900**	3,500	< 220	4,700	300	**1,300**	< 220	250	2,300	4,900
SP134-002(5-6)	08/01/02	5	6	1,800,000	490,000	960,000	**760,000**	**750,000**	**590,000**	290,000	**330,000**	**970,000**	**11,000**	1,000,000	1,200,000	**220,000**	**2,900,000**	**8,600,000**	3,300,000	**1,800,000**

Table 3. Soil Results - Detected Polynuclear Aromatic Hydrocarbons (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
Risk Assessment Framework Screening Levels				**3,400,000**	**3,400,000**	**17,000,000**	**150**	**15**	**150**	**1,700,000**	**1,500**	**15,000**	**15**	**2,300,000**	**2,300,000**	**150**	**310,000**	**3,600**	**17,000,000**	**1,700,000**
SP135-001(0-1)	08/01/02	0	1	37,000	4,000	14,000	**11,000**	**7,300**	**5,700**	2,100	**2,700**	11,000	< 330	15,000	16,000	**1,900**	49,000	**96,000**	62,000	29,000
SP135-002(8-10)	08/01/02	8	10	2,100,000	270,000	1,100,000	**560,000**	**380,000**	**310,000**	110,000	**64,000**	**430,000**	**16,000**	870,000	800,000	**80,000**	**3,800,000**	**9,600,000**	3,300,000	1,500,000
SP135-003(15-16)	08/01/02	15	16	120	76	100	93	**75**	61	< 38	< 38	100	< 38	130	110	< 38	210	**4,900**	410	200
SP136-001(2-3)	08/01/02	2	3	18,000	59,000	44,000	**41,000**	**36,000**	**33,000**	17,000	**12,000**	**38,000**	**4,600**	63,000	58,000	**12,000**	130,000	**280,000**	160,000	89,000
SP136-002(4-6)	08/01/02	4	6	1,300,000	310,000	640,000	**490,000**	**460,000**	**310,000**	200,000	**190,000**	**450,000**	**88,000**	590,000	760,000	**150,000**	**2,200,000**	**6,600,000**	2,100,000	970,000
SP136-003(29-30)	08/01/02	29	30	< 37	< 37	< 37	< 37	< 37	< 37	42	< 37	< 37	< 37	< 37	< 37	< 37	39	100	65	< 37
SB137-001(0-1)	08/01/02	0	1	< 36	< 36	50	**190**	**190**	**250**	140	100	220	< 36	340	< 36	130	< 36	59	210	340
SB137-002(5.5-8)	08/01/02	5.5	8	740,000	970,000	800,000	**640,000**	**560,000**	**430,000**	120,000	**220,000**	**630,000**	**9,400**	1,100,000	1,000,000	**90,000**	**3,300,000**	**9,200,000**	3,100,000	**2,100,000**
SB137-003(26-27)	08/01/02	26	27	120	44	98	70	**62**	43	< 37	< 37	70	< 37	120	89	< 37	140	340	360	200
SP138-001(2-3)	08/01/02	2	3	< 41	58	220	**430**	**370**	**380**	240	560	770	**110**	900	< 41	**210**	1,600	1,900	1,900	760
SP138-002(6-8)	08/01/02	6	8	< 42	160	430	**660**	**550**	**510**	250	560	730	**68**	1,200	160	**270**	120	170	1,100	1,000
SB139-001(2-3)	08/01/02	2	3	30,000	64,000	220,000	**170,000**	**300,000**	**130,000**	170,000	**130,000**	**200,000**	**21,000**	540,000	130,000	**150,000**	130,000	**97,000**	560,000	410,000
SB139-002(8-10)	08/01/02	8	10	260	460	1,800	**2,700**	**2,700**	**3,100**	1,300	**1,700**	2,800	**220**	5,200	1,900	**1,300**	420	1,200	4,200	4,200
SB139-003(16.5-17)	08/01/02	16.5	17	8,700	180,000	300,000	**190,000**	**180,000**	**150,000**	8,000	**120,000**	**190,000**	**1,100**	600,000	300,000	**7,800**	**400,000**	**1,700,000**	850,000	420,000
SB139-004(23-24)	08/01/02	23	24	< 37	46	61	67	**59**	55	< 37	< 37	69	< 37	160	61	< 37	64	580	250	120
SB139-005(24-25)	08/01/02	24	25	< 37	59	88	100	**83**	83	< 37	47	93	< 37	240	100	< 37	81	340	330	170
SP140-001(0-1)	08/01/02	0	1	< 37	42	< 37	59	**52**	74	42	54	62	< 37	68	< 37	< 37	< 37	**< 37**	43	61
SP140-002(8-10)	08/01/02	8	10	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	**< 39**	< 39	< 39
SP141-001(1-2)	08/01/02	1	2	< 39	41	310	**1,300**	**940**	**1,100**	520	630	1,400	**55**	2,400	57	**500**	< 39	**< 39**	1,100	1,900
SP141-002(6-8)	08/01/02	6	8	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	**< 39**	< 39	< 39
SP141-003(18-20)	08/01/02	18	20	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	**< 37**	< 37	< 37
SB142-001(1-2)	08/01/02	1	2	910	450	2,400	**5,000**	**3,800**	**4,600**	2,100	**1,800**	5,000	**210**	9,100	1,400	**1,900**	3,700	**5,300**	10,000	8,600
SB142-002(4-6)	08/01/02	4	6	< 41	100	200	**450**	**420**	**530**	280	280	510	< 41	710	110	**240**	740	890	800	770
SP143-001(1-2)	08/01/02	1	2	< 38	< 38	48	140	**100**	130	66	56	200	< 38	230	< 38	53	220	92	730	200
SP143-002(8-10)	08/01/02	8	10	780	74	220	120	**100**	69	< 41	< 41	110	< 41	190	290	< 41	500	2,600	1,100	320
SP143-003(23-24)	08/01/02	23	24	73,000	690,000	390,000	**240,000**	**110,000**	**81,000**	54,000	**46,000**	**220,000**	**7,200**	420,000	450,000	**40,000**	**1,100,000**	**2,600,000**	1,200,000	670,000
SP143-004(26-28)	08/01/02	26	28	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	60	160	97	49
SP144-001(2-3)	08/01/02	2	3	< 43	410	280	**1,300**	**1,000**	**1,200**	950	440	1,700	**70**	1,400	130	**640**	65	93	1,100	2,300
SP144-002(8-10)	08/01/02	8	10	1,100	< 39	420	< 39	< 39	< 39	< 39	< 39	< 39	< 39	200	590	< 39	500	2,700	1,500	220
SP145-001(0-1)	08/01/02	0	1	93	740	560	**1,800**	**1,800**	**1,600**	1,600	900	1,900	**500**	2,400	240	**1,100**	430	570	1,500	2,500
SP145-002(4-6)	08/01/02	4	6	810,000	27,000	340,000	**140,000**	**120,000**	**79,000**	45,000	**34,000**	**140,000**	**12,000**	210,000	220,000	**33,000**	**1,500,000**	**2,500,000**	1,100,000	460,000
SP145-003(23-24)	08/01/02	23	24	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	< 44	**< 44**	< 44	< 44
SP146-001(1-2)	08/01/02	1	2	< 37	240	220	**790**	**540**	**650**	310	260	940	< 37	1,200	150	**240**	460	1,500	1,100	1,900
SP146-002(4-6)	08/01/02	4	6	430,000	800,000	680,000	**540,000**	**310,000**	**170,000**	130,000	**160,000**	**580,000**	**9,400**	830,000	840,000	**99,000**	**3,000,000**	**2,900,000**	2,900,000	1,400,000
SP146-004(29-30)	08/01/02	29	30	54	58	60	47	**40**	< 37	< 37	< 37	66	< 37	75	71	< 37	150	340	220	110
SP147-001(0-1)	08/01/02	0	1	< 35	42	59	130	**130**	140	98	160	150	< 35	230	< 35	80	< 35	**< 35**	150	220
SP147-002(6-8)	08/01/02	6	8	110	130	< 46	< 46	< 46	< 46	< 46	< 46	< 46	< 46	< 46	< 46	< 46	< 46	430	< 46	< 46
SP147-003(29-30)	08/01/02	29	30	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	**< 37**	< 37	< 37
SP148-001(1-2)	08/01/02	1	2	< 38	160	110	**730**	**580**	**600**	340	420	580	< 38	750	< 38	**290**	43	57	390	950
SP148-002(6-8)	08/01/02	6	8	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	**< 39**	< 39	< 39
SP149-001(2-3)	08/01/02	2	3	< 48	91	270	**210**	**240**	**1,200**	1,300	920	400	**850**	150	< 48	**1,200**	55	87	160	130
SP149-002(8-10)	08/01/02	8	10	< 40	58	74	45	**51**	< 40	52	42	53	< 40	100	56	45	< 40	**< 40**	170	94
SP150-001(2-3)	08/01/02	2	3	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	69	260	49	< 42
SP150-002(4-6)	08/01/02	4	6	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	**< 40**	< 40	< 40
SP151-001(0-1)	08/01/02	0	1	< 38	46	100	**270**	**240**	**310**	160	150	260	< 38	430	< 38	130	150	500	340	400
SP151-002(4-6)	08/01/02	4	6	< 190	< 190	290	**300**	**320**	**370**	< 190	220	290	< 190	560	610	< 190	4,700	**20,000**	700	580
SP151-003(8-10)	08/01/02	8	10	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	**< 40**	< 40	< 40
SP152-001(1-2)	08/01/02	1	2	< 41	46	48	**180**	**160**	**200**	130	110	230	< 41	270	< 41	110	230	960	240	310

Table 3. Soil Results - Detected Polynuclear Aromatic Hydrocarbons (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
Risk Assessment Framework Screening Levels				**3,400,000**	**3,400,000**	**17,000,000**	**150**	**15**	**150**	**1,700,000**	**1,500**	**15,000**	**15**	**2,300,000**	**2,300,000**	**150**	**310,000**	**3,600**	**17,000,000**	**1,700,000**
SP152-002(4-6)	08/01/02	4	6	50	< 41	< 41	< 41	< 41	< 41	< 41	< 41	49	< 41	67	47	< 41	290	1,700	< 41	46
SP154-001(2-3)	08/01/02	2	3	< 1300	9,800	24,000	**70,000**	**36,000**	**56,000**	18,000	**29,000**	**64,000**	**3,800**	160,000	9,100	**21,000**	6,900	**16,000**	67,000	89,000
SP154-002(4-6)	08/01/02	4	6	< 1200	3,400	9,800	**29,000**	**15,000**	**22,000**	7,700	**14,000**	**26,000**	**1,500**	60,000	3,000	**8,700**	3,000	**8,700**	37,000	50,000
SP154-003(10-12)	08/01/02	10	12	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	**< 38**	< 38	< 38
SP155-001(2-3)	08/01/02	2	3	< 40	< 40	< 40	100	**96**	120	62	59	120	< 40	130	< 40	52	< 40	**< 40**	150	170
SP155-002(4-6)	08/01/02	4	6	760	970	2,900	**8,600**	**5,800**	**9,600**	3,500	**4,300**	8,900	**520**	14,000	1,300	**3,300**	790	1,400	11,000	14,000
SP156-001(0-1)	08/01/02	0	1	110	780	700	**2,600**	**2,200**	**2,100**	1,600	**1,600**	2,300	**580**	3,700	440	**1,200**	160	260	3,100	3,900
SP156-002(8-10)	08/01/02	8	10	880,000	1,700,000	1,400,000	**900,000**	**810,000**	**630,000**	390,000	**290,000**	**740,000**	**88,000**	1,500,000	1,500,000	**300,000**	**2,700,000**	**8,700,000**	4,300,000	**2,100,000**
SP156-003(25-26)	08/01/02	25	26	49	74	100	41	**89**	75	38	51	60	< 37	76	65	< 37	43	160	190	100
SP157-001(0-1)	08/01/02	0	1	< 37	< 37	< 37	60	**60**	83	70	55	77	< 37	90	< 37	59	< 37	110	57	110
SP157-002(8-10)	08/01/02	8	10	52,000	52,000	69,000	**59,000**	**23,000**	**30,000**	12,000	**29,000**	**58,000**	**2,900**	85,000	160,000	**12,000**	**3,700,000**	**10,000,000**	480,000	160,000
SP158-001(0-1)	08/01/02	0	1	77	62	230	**690**	**590**	**720**	300	350	670	< 40	1,000	85	**270**	75	210	850	1,100
SP158-002(6-8)	08/01/02	6	8	1,800	3,400	11,000	**7,100**	**4,600**	**4,400**	1,500	**3,000**	5,500	< 280	14,000	9,400	**1,600**	6,300	**17,000**	21,000	10,000
SB159-001(1-2)	08/01/02	1	2	83	140	160	**400**	**410**	**580**	380	210	600	< 39	670	140	**270**	44	74	920	890
SB159-002(6-7)	08/01/02	6	7	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	< 42	**< 42**	72	47
SB159-003(19-20)	08/01/02	19	20	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	**< 37**	< 37	< 37
SB160-001(1-2)	08/01/02	1	2	< 42	74	92	**320**	**260**	**430**	180	150	350	**49**	540	< 42	**170**	< 42	50	310	460
SB160-002(5-6)	08/01/02	5	6	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	44	100	51	< 40
SB161-001(1-2)	08/01/02	1	2	150	100	260	**460**	**340**	**430**	180	270	400	< 37	680	150	**180**	97	190	890	690
SB161-002(8-10)	08/01/02	8	10	50	< 42	83	65	**58**	< 42	< 42	< 42	72	< 42	110	60	< 42	< 42	**< 42**	300	180
SB161-003(12-14)	08/01/02	12	14	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	56	< 40	< 40	< 40	**< 40**	140	92
SP162-001(2-3)	08/01/02	2	3	< 35	< 35	< 35	38	**41**	39	36	38	44	< 35	53	< 35	< 35	57	380	< 35	58
SP162-002(6-8)	08/01/02	6	8	61,000	44,000	75,000	**170,000**	**47,000**	**85,000**	41,000	**46,000**	**160,000**	**6,400**	300,000	250,000	**35,000**	**4,900,000**	**22,000,000**	1,100,000	640,000
SP163-001(1-2)	08/01/02	1	2	< 64	76	71	**450**	**370**	**460**	310	320	410	< 64	570	< 64	**220**	< 64	**< 64**	220	560
SP163-002(3-5)	08/01/02	3	5	1,900,000	210,000	1,100,000	**640,000**	**550,000**	**480,000**	140,000	**90,000**	**670,000**	**23,000**	1,000,000	1,100,000	**98,000**	**2,700,000**	**6,700,000**	2,900,000	1,400,000
SP163-003(22-24)	08/01/02	22	24	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	**< 39**	< 39	< 39
SP164-001(2-3)	08/01/02	2	3	< 62	< 62	< 62	**150**	**110**	120	< 62	78	120	< 62	250	< 62	< 62	< 62	**< 62**	130	260
SP164-002(3-5)	08/01/02	3	5	32,000	20,000	110,000	**220,000**	**150,000**	**170,000**	20,000	**100,000**	**170,000**	**3,100**	410,000	42,000	**27,000**	< 960	1,600	33,000	370,000
SP165-001(0-1)	08/01/02	0	1	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	**< 36**	< 36	< 36
SB166-001(22.5-23.5)	08/01/02	22.5	23.5	39,000	610,000	360,000	**240,000**	**120,000**	**100,000**	46,000	**89,000**	**150,000**	**7,900**	550,000	430,000	**50,000**	**760,000**	**2,700,000**	890,000	380,000
SB166-002(25-26)	08/01/02	25	26	< 36	43	46	36	< 36	< 36	< 36	< 36	< 36	< 36	73	48	< 36	64	160	150	55
SB167-001(0-1)	08/01/02	0	1	< 37	< 37	< 37	54	**44**	80	37	< 37	62	< 37	79	< 37	39	< 37	43	79	73
SB167-002(5-6)	08/01/02	5	6	33,000	470,000	360,000	**220,000**	**130,000**	**140,000**	26,000	**68,000**	**160,000**	**10,000**	460,000	340,000	**27,000**	**860,000**	**1,300,000**	820,000	340,000
SP168-001(0-1)	08/01/02	0	1	44	< 41	120	**440**	**450**	**450**	340	520	610	**130**	960	44	**290**	58	120	540	900
SP168-002(3-5)	08/01/02	3	5	< 200	< 200	400	**630**	**740**	**550**	590	760	940	**200**	1,900	< 200	**500**	< 200	**< 200**	970	1,600
SB169-001(0-2)	08/01/02	0	2	< 48	190	360	**1,300**	**1,500**	**1,900**	1,000	940	1,800	**110**	2,900	73	**950**	< 48	69	1,300	2,300
SB169-002(8-9)	08/01/02	8	9	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	**< 40**	< 40	< 40
SB170-001(0-1)	08/01/02	0	1	< 47	79	210	**820**	**630**	**930**	380	370	1,100	< 47	1,500	50	**340**	< 47	48	700	1,400
SB170-002(4-6)	08/01/02	4	6	< 44	63	57	**170**	**160**	**230**	120	110	180	< 44	240	< 44	100	< 44	65	190	260
SB170-003(20-21)	08/01/02	20	21	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	< 37	**< 37**	< 37	< 37
SB171-001(2-3)	08/01/02	2	3	< 91	450	280	**1,400**	**890**	**1,100**	520	1,100	1,300	< 91	1,800	100	**520**	160	410	1,000	1,800
SB171-002(6-7)	08/01/02	6	7	51	< 49	< 49	87	**72**	78	< 49	50	83	< 49	270	< 49	< 49	< 49	51	52	230
SP172-001(2-3)	08/01/02	2	3	< 57	460	1,300	**3,300**	**2,800**	**8,100**	2,000	**3,600**	4,600	**250**	2,800	60	**2,000**	59	**< 57**	800	3,800
SP172-002(8-10)	08/01/02	8	10	68,000	54,000	160,000	**190,000**	**130,000**	**140,000**	28,000	**60,000**	**130,000**	**8,800**	330,000	100,000	**36,000**	2,200	**11,000**	390,000	280,000
SP173-001(0-1)	08/01/02	0	1	< 60	< 60	< 60	< 60	< 60	< 60	< 60	< 60	< 60	< 60	< 60	< 60	< 60	< 60	**< 60**	< 60	< 60
SP173-002(4-6)	08/01/02	4	6	41,000	15,000	37,000	**79,000**	**55,000**	**64,000**	16,000	**36,000**	**64,000**	**3,700**	120,000	34,000	**20,000**	1,200	3,300	68,000	110,000
SP173-003(8-10)	08/01/02	8	10	360	300	67	< 40	< 40	< 40	< 40	< 40	< 40	< 40	130	540	< 40	< 40	690	180	100
SP174-001(1-2)	08/01/02	1	2	< 38	< 38	< 38	< 38	**40**	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	**< 38**	< 38	< 38

Table 3. Soil Results - Detected Polynuclear Aromatic Hydrocarbons (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
Risk Assessment Framework Screening Levels				**3,400,000**	**3,400,000**	**17,000,000**	**150**	**15**	**150**	**1,700,000**	**1,500**	**15,000**	**15**	**2,300,000**	**2,300,000**	**150**	**310,000**	**3,600**	**17,000,000**	**1,700,000**
SP174-002(6-8)	08/01/02	6	8	76	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	< 39	**< 39**	< 39	< 39
SB175-001(1-2)	08/01/02	1	2	< 40	< 40	120	**190**	**120**	86	75	130	210	< 40	360	< 40	58	340	200	1,300	290
SB175-002(7-8)	08/01/02	7	8	45	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	< 40	**< 40**	< 40	< 40
SB175-003(22-23)	08/01/02	22	23	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	< 38	**< 38**	< 38	< 38
SB176-001(2-3)	08/01/02	2	3	< 360	430	< 360	**790**	**730**	**1,100**	660	480	1,200	< 360	1,000	< 360	**510**	< 360	**< 360**	730	1,300
SB176-002(6-7)	08/01/02	6	7	< 39	450	220	**630**	**630**	**850**	640	890	730	**75**	670	77	**550**	55	110	450	900
SB177-001(0-1)	08/01/02	0	1	< 180	< 180	< 180	< 180	< 180	< 180	< 180	< 180	180	< 180	230	< 180	< 180	< 180	**< 180**	300	270
SB177-002(7-8)	08/01/02	7	8	< 40	< 40	43	< 40	< 40	< 40	< 40	< 40	< 40	< 40	43	< 40	< 40	< 40	**< 40**	120	73
SB177-003(19-20)	08/01/02	19	20	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	< 35	**< 35**	49	< 35
SB178-001(0-1)	08/01/02	0	1	< 38	62	< 38	89	**100**	**160**	63	89	120	< 38	94	< 38	68	< 38	**< 38**	86	160
SB178-002(5-6)	08/01/02	5	6	510	< 220	990	**2,400**	**2,000**	**2,500**	1,200	1,400	2,400	< 220	5,300	490	**1,100**	< 220	520	3,400	4,500
SP179-001(1-2)	08/01/02	1	2	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	< 36	**< 36**	40	< 36
SP179-002(6-8)	08/01/02	6	8	< 39	< 39	65	140	**96**	120	47	68	110	< 39	200	58	44	< 39	76	240	190
SP180-001(2-3)	08/01/02	2	3	< 40	< 40	< 40	110	**170**	**260**	130	150	140	**46**	150	< 40	100	48	57	180	140
SP180-002(3-5)	08/01/02	3	5	< 45	< 45	< 45	120	**190**	**270**	160	200	140	**53**	160	< 45	130	< 45	**< 45**	170	150
SP180-003(10-12)	08/01/02	10	12	1,100	200	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	< 41	54	< 41	< 41	**< 41**	< 41	< 41

Notes:
1) The Risk Assessment Framework Screening Levels are a hierarchical combination of USEPA Regional Screening

Table 4. Soil Results - Detected Semi-Volatile Organic Compounds [excluding PAHs] (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Bis(2-ethylhexyl)phthalate	Carbazole	Dibenzofuran	2,4-Dimethylphenol	2-Methylphenol	4-Methylphenol	Phenol
Risk Assessment Framework Screening Levels				**35,000**	**32,000**	**78,000**	**NS**	**3,100,000**	**NS**	**18,000,000**
SB09-001(4-6)	08/01/02	4	6	< 390	< 390	< 20	< 20	< 20	< 20	< 20
SB11-001(5-7)	08/01/02	5	7	< 420	< 420	< 22	< 22	< 22	< 22	< 22
SB11-002(14-16)	08/01/02	14	16	< 390	< 390	220	< 20	< 20	< 20	< 20
SB12-001(0-1)	08/01/02	0	1	< 370	< 370	30	< 19	< 19	< 19	< 19
SB13-001(2-3)	08/01/02	2	3	< 360	< 360	58	< 18	< 18	< 18	< 18
SB13-002(4-6)	08/01/02	4	6	< 450	< 450	< 23	< 23	< 23	< 23	< 23
SB15-001(10-12)	08/01/02	10	12	< 340	16,000	42,000	< 17	< 17	< 17	< 17
SB24-001(5-7)	08/01/02	5	7	< 400	< 400	< 20	< 20	< 20	< 20	< 20
SB27-001(4-6)	08/01/02	4	6	< 410	< 410	< 21	< 21	< 21	< 21	< 21
SB28-001(0-1)	08/01/02	0	1	< 340	< 340	< 17	< 17	< 17	< 17	< 17
SB32-001(8-10)	08/01/02	8	10	< 1900	< 1900	49,000	< 96	< 96	< 96	< 96
SB33-001(4-6)	08/01/02	4	6	< 24000	< 24000	56,000	< 1200	2,300	1,900	< 1200
SB35-001(22-23)	08/01/02	22	23	< 1800	13,000	42,000	< 18	< 18	< 18	< 18
SB36-001(10-12)	08/01/02	10	12	< 2200	20,000	**97,000**	< 110	< 110	< 110	< 110
SB40-001(8-10)	08/01/02	8	10	< 4100	**330,000**	**1,000,000**	1,400	< 520	590	< 520
SB40-002(22-23)	08/01/02	22	23	< 3900	**440,000**	**1,000,000**	< 3900	200,000	370,000	16,000
SB42-001(6-8)	08/01/02	6	8	< 4300	**550,000**	**1,300,000**	1,200,000	690,000	1,900,000	410,000
SB49-001(10-12)	08/01/02	10	12	< 400	4,200	23,000	< 20	< 20	< 20	< 400
SP100-001(2-3)	08/01/02	2	3	< 170	< 170	< 69	< 340	< 69	< 69	< 170
SP100-002(8-10)	08/01/02	8	10	< 200	< 200	< 80	< 400	< 80	< 80	< 200
SP100-003(6-8)	08/01/02	6	8	< 220	< 220	460	< 440	< 89	< 89	< 220
SP101-001(1-2)	08/01/02	1	2	< 190	< 190	130	< 370	< 75	< 75	< 190
SP101-002(5-7)	08/01/02	5	7	< 940	< 940	< 380	< 1900	< 380	< 380	< 940
SP102-001(2-3)	08/01/02	2	3	< 190	< 190	< 76	< 370	< 76	< 76	< 190
SP102-002(8-10)	08/01/02	8	10	< 200	< 200	< 80	< 400	< 80	< 80	< 200
SP102-003(14-16)	08/01/02	14	16	< 210	< 210	< 86	< 420	< 42	< 42	< 210
SP103-001(1-2)	08/01/02	1	2	< 950	< 950	< 380	< 1900	< 380	< 380	< 950
SP103-002(6-8)	08/01/02	6	8	< 990	< 990	2,800	< 2000	< 400	< 400	< 990
SP103-003(24-25)	08/01/02	24	25	< 210	< 210	< 83	< 410	< 83	< 83	< 210
SP104-001(2-3)	08/01/02	2	3	< 940	< 940	1,200	< 1900	< 380	< 380	< 940
SP104-002(8-10)	08/01/02	8	10	< 19000	< 19000	56,000	< 37000	< 7400	< 7400	< 19000
SP104-003(19-20)	08/01/02	19	20	< 200	200	160	< 390	< 79	< 79	< 200
SP106-001(2-3)	08/01/02	2	3	< 11000	< 11000	< 4500	< 22000	< 4500	< 4500	< 11000
SP106-002(6-8)	08/01/02	6	8	< 3900	< 3900	25,000	< 7800	< 1600	< 1600	< 3900
SP106-003(19-20)	08/01/02	19	20	< 9500	< 9500	**110,000**	< 19000	< 3800	< 3800	< 9500
SP107-001(0-1)	08/01/02	0	1	< 3900	< 3900	< 1600	< 7700	< 1600	< 1600	< 3900
SP107-002(5-7)	08/01/02	5	7	< 1200	2,000	11,000	< 2300	< 470	< 470	< 1200
SB108-001(0-1)	08/01/02	0	1	< 1900	< 1900	840	< 3800	< 760	< 760	< 1900
SB108-002(4-6)	08/01/02	4	6	< 23000	< 23000	54,000	< 46000	< 9300	< 9300	< 23000
SB108-003(11-12)	08/01/02	11	12	< 200	< 200	< 79	< 390	< 79	< 79	< 200
SB109-001(1-2)	08/01/02	1	2	< 1800	< 1800	830	< 3600	< 740	< 740	< 1800
SB109-002(3-4)	08/01/02	3	4	< 3600	6,700	39,000	< 7200	< 1500	< 1500	< 3600
SP110-001(2-3)	08/01/02	2	3	< 180	< 180	420	< 350	< 71	< 71	< 180
SP110-002(6-8)	08/01/02	6	8	< 950	< 950	840	< 1900	< 380	< 380	< 950
SP110-003(14-16)	08/01/02	14	16	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SP111B-001(0-1)	08/01/02	0	1	< 1800	< 1800	< 740	< 3600	< 740	< 740	< 1800
SP111B-002(8-10)	08/01/02	8	10	< 890	< 890	5,000	< 1800	< 360	< 360	< 890
SP112-001(0-1)	08/01/02	0	1	< 180	< 180	< 74	< 360	< 74	< 74	< 180
SP112-002(6-8)	08/01/02	6	8	< 1000	< 1000	1,100	< 2000	< 400	< 400	< 1000
SB113-001(0-1)	08/01/02	0	1	< 860	< 860	< 340	< 1700	< 340	< 340	< 860
SB113-002(5-6)	08/01/02	5	6	< 4100	7,200	56,000	< 8100	< 1700	< 1700	< 4100
SB113-003(24-25)	08/01/02	24	25	< 180	< 180	< 72	< 360	< 72	< 72	< 180
SB114-001(1-2)	08/01/02	1	2	< 210	< 210	< 85	< 420	< 85	< 85	< 210
SB114-002(8-10)	08/01/02	8	10	< 920	< 920	19,000	< 1800	< 370	< 370	< 920
SP115-001(2-3)	08/01/02	2	3	< 2500	3,600	24,000	< 4900	< 1000	< 1000	< 2500
SP115-002(8-10)	08/01/02	8	10	< 12000	15,000	**84,000**	< 24000	< 4900	< 4900	< 12000
SP115-003(12-14)	08/01/02	12	14	< 20000	< 20000	67,000	< 39000	< 8000	< 8000	< 20000
SP115-004(17-19)	08/01/02	17	19	< 210	380	370	< 420	< 86	< 86	< 210
SB116-001(1-2)	08/01/02	1	2	< 22000	< 22000	**110,000**	< 44000	< 8900	< 8900	< 22000
SB116-002(7-8)	08/01/02	7	8	< 2000	2,300	13,000	< 3900	< 790	< 790	< 2000
SP117-001(1-2)	08/01/02	1	2	< 1000	< 1000	14,000	< 2000	< 410	< 410	< 1000
SP117-002(6-8)	08/01/02	6	8	< 16000	< 16000	53,000	< 31000	< 6400	< 6400	< 16000
SP118-001(2-3)	08/01/02	2	3	< 1900	< 1900	< 770	< 3800	< 770	< 770	< 1900
SP118-002(6-8)	08/01/02	6	8	< 1000	< 1000	1,000	< 2100	< 420	< 420	< 1000
SB119-001(2-3)	08/01/02	2	3	< 200	< 200	120	< 400	< 80	< 80	< 200
SB119-002(3-4)	08/01/02	3	4	< 220	< 220	< 89	< 440	< 89	< 89	< 220
SB120-001(1-2)	08/01/02	1	2	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SB120-002(5-6)	08/01/02	5	6	< 230	< 230	100	< 460	< 94	< 94	< 230
SB121-001(1-2)	08/01/02	1	2	< 220	< 220	< 88	< 430	< 88	< 88	< 220
SB121-002(6-7)	08/01/02	6	7	< 200	< 200	< 81	< 400	< 81	< 81	< 200
SB121-003(20-20.5)	08/01/02	20	20.5	< 210	< 210	< 84	< 410	< 84	< 84	< 210
SP122-001(2-3)	08/01/02	2	3	< 1900	< 1900	< 750	< 3700	< 750	< 750	< 1900
SP122-002(8-10)	08/01/02	8	10	< 210	< 210	< 82	< 410	< 82	< 82	< 210
SP122-003(24-25)	08/01/02	24	25	< 190	< 190	< 74	< 370	< 74	< 74	< 190
SB123-001(2-3)	08/01/02	2	3	< 190	< 190	92	< 370	< 75	< 75	< 190
SB123-002(8-10)	08/01/02	8	10	< 210	< 210	< 86	< 420	< 86	< 86	< 210
SP124-001(1-2)	08/01/02	1	2	< 1800	< 1800	< 730	< 3600	< 730	< 730	< 1800
SP124-002(4-6)	08/01/02	4	6	< 9800	< 9800	**340,000**	< 19000	< 3900	< 3900	< 9800
SP124-003(26-27)	08/01/02	26	27	< 180	< 180	200	< 360	< 74	< 74	< 180
SP126-001(0-1)	08/01/02	0	1	< 380	< 380	< 150	< 750	< 150	< 150	< 380
SP126-002(5-6)	08/01/02	5	6	< 26000	**45,000**	**200,000**	< 51000	< 10000	< 10000	< 26000

Table 4. Soil Results - Detected Semi-Volatile Organic Compounds [excluding PAHs] (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Bis(2-ethylhexyl)phthalate	Carbazole	Dibenzofuran	2,4-Dimethylphenol	2-Methylphenol	4-Methylphenol	Phenol
Risk Assessment Framework Screening Levels				**35,000**	**32,000**	**78,000**	**NS**	**3,100,000**	**NS**	**18,000,000**
SP127-001(0-1)	08/01/02	0	1	< 12000	< 12000	< 4600	< 23000	< 4600	< 4600	< 12000
SP127-002(5-7)	08/01/02	5	7	< 12000	18,000	< 250000	< 24000	< 4900	< 4900	< 12000
SP128-001(1-2)	08/01/02	1	2	< 880	< 880	800	< 1700	< 350	< 350	< 880
SP128-002(8-10)	08/01/02	8	10	< 200	< 200	< 81	< 400	< 81	< 81	< 200
SB130-001(1-2)	08/01/02	1	2	< 180	< 180	< 72	< 350	< 72	< 72	< 180
SB130-002(5-6)	08/01/02	5	6	< 210	< 210	< 84	< 410	< 84	< 84	< 210
SP131-001(0-1)	08/01/02	0	1	< 210	< 210	< 86	< 420	< 86	< 86	< 210
SP131-002(6-8)	08/01/02	6	8	< 200	< 200	< 80	< 390	< 80	< 80	< 200
SB132-001(0-1)	08/01/02	0	1	< 200	< 200	160	< 400	< 81	< 81	< 200
SB132-002(7-8)	08/01/02	7	8	< 200	< 200	< 82	< 400	< 82	< 82	< 200
SP133-001(0-1)	08/01/02	0	1	< 190	< 190	110	< 370	< 76	< 76	< 190
SP133-002(4-6)	08/01/02	4	6	230	< 200	< 79	< 390	< 79	< 79	< 200
SP133-003(24-25)	08/01/02	24	25	< 5800	19,000	67,000	< 11000	< 2300	< 2300	< 5800
SP133-004(26-28)	08/01/02	26	28	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SP134-001(1-2)	08/01/02	1	2	< 1100	< 1100	< 450	< 2200	< 450	< 450	< 1100
SP134-002(5-6)	08/01/02	5	6	< 24000	**42,000**	**170,000**	< 47000	< 9600	< 9600	< 24000
SP135-001(0-1)	08/01/02	0	1	< 1700	< 1700	2,100	< 3300	< 660	< 660	< 1700
SP135-002(8-10)	08/01/02	8	10	< 9300	**43,000**	**100,000**	< 18000	< 3700	< 3700	< 9300
SP135-003(15-16)	08/01/02	15	16	240	< 190	< 78	< 380	< 78	< 78	< 190
SP136-001(2-3)	08/01/02	2	3	< 1400	1,600	7,100	< 2800	< 560	< 560	< 1400
SP136-002(4-6)	08/01/02	4	6	< 23000	**34,000**	**89,000**	< 46000	< 9400	< 9400	< 23000
SP136-003(29-30)	08/01/02	29	30	< 1300	< 190	< 75	< 370	< 75	< 75	< 190
SB137-001(0-1)	08/01/02	0	1	< 180	< 180	< 73	< 360	< 73	< 73	< 180
SB137-002(5.5-8)	08/01/02	5.5	8	< 10000	24,000	**160,000**	< 20000	< 4100	< 4100	< 10000
SB137-003(26-27)	08/01/02	26	27	420	< 190	< 75	< 370	< 75	< 75	< 190
SP138-001(2-3)	08/01/02	2	3	< 210	< 210	770	< 410	< 84	< 84	< 210
SP138-002(6-8)	08/01/02	6	8	< 210	< 210	140	< 420	< 85	< 85	< 210
SB139-001(2-3)	08/01/02	2	3	< 23000	**130,000**	**240,000**	< 45000	< 9000	< 9000	< 23000
SB139-002(8-10)	08/01/02	8	10	< 1100	2,300	1,300	< 2100	< 430	< 430	< 1100
SB139-003(16.5-17)	08/01/02	16.5	17	< 980	< 390000	**310,000**	< 1900	< 390	< 390	< 980
SB139-004(23-24)	08/01/02	23	24	< 190	< 190	< 74	12,000	6,300	14,000	1,200
SB139-005(24-25)	08/01/02	24	25	< 190	< 190	85	< 370	3,500	6,800	1,400
SP140-001(0-1)	08/01/02	0	1	< 190	< 190	< 76	< 370	< 76	< 76	< 190
SP140-002(8-10)	08/01/02	8	10	< 200	< 200	< 79	< 390	< 79	< 79	< 200
SP141-001(1-2)	08/01/02	1	2	< 200	< 200	< 79	< 390	< 79	< 79	< 200
SP141-002(6-8)	08/01/02	6	8	< 200	< 200	< 79	< 390	< 79	< 79	< 200
SP141-003(18-20)	08/01/02	18	20	< 190	< 190	< 74	< 370	< 74	< 74	< 190
SB142-001(1-2)	08/01/02	1	2	< 950	< 950	810	< 1900	< 380	< 380	< 950
SB142-002(4-6)	08/01/02	4	6	< 210	< 210	< 84	< 410	< 84	< 84	< 210
SP143-001(1-2)	08/01/02	1	2	< 190	< 190	< 77	< 380	< 77	< 77	< 190
SP143-002(8-10)	08/01/02	8	10	< 210	240	290	< 410	< 84	< 84	< 210
SP143-003(23-24)	08/01/02	23	24	< 9700	13,000	53,000	< 19000	< 3900	< 3900	< 9700
SP143-004(26-28)	08/01/02	26	28	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SP144-001(2-3)	08/01/02	2	3	< 220	< 220	< 88	< 430	< 88	< 88	< 220
SP144-002(8-10)	08/01/02	8	10	< 200	200	100	< 390	< 79	< 79	< 200
SP145-001(0-1)	08/01/02	0	1	430	< 230	< 94	< 460	< 94	< 94	< 230
SP145-002(4-6)	08/01/02	4	6	< 19000	< 19000	54,000	< 37000	< 7500	< 7500	< 19000
SP145-003(23-24)	08/01/02	23	24	< 220	< 220	< 89	< 440	< 89	< 89	< 220
SP146-001(1-2)	08/01/02	1	2	< 190	< 190	< 76	< 370	< 76	< 76	< 190
SP146-002(4-6)	08/01/02	4	6	< 20000	**32,000**	**150,000**	< 40000	< 8100	< 8100	< 20000
SP146-004(29-30)	08/01/02	29	30	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SP147-001(0-1)	08/01/02	0	1	< 180	< 180	< 71	< 350	< 71	< 71	< 180
SP147-002(6-8)	08/01/02	6	8	< 230	< 230	< 93	< 460	< 93	< 93	< 230
SP147-003(29-30)	08/01/02	29	30	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SP148-001(1-2)	08/01/02	1	2	< 190	< 190	< 77	< 380	< 77	< 77	< 190
SP148-002(6-8)	08/01/02	6	8	< 200	< 200	< 80	< 390	< 80	< 80	< 200
SP149-001(2-3)	08/01/02	2	3	< 240	< 240	< 97	< 480	< 97	< 97	< 240
SP149-002(8-10)	08/01/02	8	10	< 200	< 200	< 81	< 400	< 81	< 81	< 200
SP150-001(2-3)	08/01/02	2	3	< 210	< 210	< 86	< 420	< 86	< 86	< 210
SP150-002(4-6)	08/01/02	4	6	< 200	< 200	< 82	< 400	< 82	< 82	< 200
SP151-001(0-1)	08/01/02	0	1	< 190	< 190	< 77	< 380	< 77	< 77	< 190
SP151-002(4-6)	08/01/02	4	6	< 980	< 980	510	< 1900	< 400	< 400	< 980
SP151-003(8-10)	08/01/02	8	10	< 200	< 200	< 81	< 400	< 81	< 81	< 200
SP152-001(1-2)	08/01/02	1	2	< 210	< 210	< 83	< 410	< 83	< 83	< 210
SP152-002(4-6)	08/01/02	4	6	< 210	< 210	< 84	< 410	< 84	< 84	< 210
SP154-001(2-3)	08/01/02	2	3	< 6700	< 6700	7,900	< 13000	< 2700	< 2700	< 6700
SP154-002(4-6)	08/01/02	4	6	< 6300	< 6300	3,300	< 12000	< 2500	< 2500	< 6300
SP154-003(10-12)	08/01/02	10	12	< 190	< 190	< 77	< 380	< 77	< 77	< 190
SP155-001(2-3)	08/01/02	2	3	< 200	< 200	< 80	< 400	< 80	< 80	< 200
SP155-002(4-6)	08/01/02	4	6	< 1000	1,200	1,000	< 2000	< 410	< 410	< 1000
SP156-001(0-1)	08/01/02	0	1	350	< 300	220	< 600	< 120	< 120	< 300
SP156-002(8-10)	08/01/02	8	10	< 12000	< 120000	**190,000**	< 23000	< 4600	< 4600	< 12000
SP156-003(25-26)	08/01/02	25	26	< 190	< 190	< 76	< 370	< 76	< 76	< 190
SP157-001(0-1)	08/01/02	0	1	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SP157-002(8-10)	08/01/02	8	10	< 11000	< 11000	35,000	< 22000	< 4500	< 4500	< 11000
SP158-001(0-1)	08/01/02	0	1	< 200	< 200	< 80	< 400	< 80	< 80	< 200
SP158-002(6-8)	08/01/02	6	8	< 1400	4,600	8,200	< 2800	< 560	610	< 1400
SB159-001(1-2)	08/01/02	1	2	< 200	< 200	< 80	< 390	< 80	< 80	< 200
SB159-002(6-7)	08/01/02	6	7	< 210	< 210	< 84	< 420	< 84	< 84	< 210
SB159-003(19-20)	08/01/02	19	20	< 180	< 180	< 74	< 370	< 74	< 74	< 180
SB160-001(1-2)	08/01/02	1	2	< 210	< 210	< 85	< 420	< 85	< 85	< 210

Table 4. Soil Results - Detected Semi-Volatile Organic Compounds [excluding PAHs] (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Bis(2-ethylhexyl)phthalate	Carbazole	Dibenzofuran	2,4-Dimethylphenol	2-Methylphenol	4-Methylphenol	Phenol
Risk Assessment Framework Screening Levels				**35,000**	**32,000**	**78,000**	**NS**	**3,100,000**	**NS**	**18,000,000**
SB160-002(5-6)	08/01/02	5	6	< 200	< 200	< 81	< 400	< 81	< 81	< 200
SB161-001(1-2)	08/01/02	1	2	490	< 190	< 74	< 370	< 74	< 74	< 190
SB161-002(8-10)	08/01/02	8	10	< 210	< 210	< 86	< 420	< 86	< 86	< 210
SB161-003(12-14)	08/01/02	12	14	< 200	< 200	< 81	< 400	< 81	< 81	< 200
SP162-001(2-3)	08/01/02	2	3	< 180	< 180	< 71	< 350	< 71	< 71	< 180
SP162-002(6-8)	08/01/02	6	8	< 23000	< 23000	57,000	< 46000	< 9400	< 9400	< 23000
SP163-001(1-2)	08/01/02	1	2	< 320	< 320	< 130	< 640	< 130	< 130	< 320
SP163-002(3-5)	08/01/02	3	5	< 16000	**46,000**	**170,000**	< 31000	< 6200	< 6200	< 16000
SP163-003(22-24)	08/01/02	22	24	< 200	< 200	< 80	< 390	< 80	< 80	< 200
SP164-001(2-3)	08/01/02	2	3	< 310	< 310	< 130	< 620	< 130	< 130	< 310
SP164-002(3-5)	08/01/02	3	5	< 4900	< 4900	30,000	< 9600	< 2000	< 2000	< 4900
SP165-001(0-1)	08/01/02	0	1	< 180	< 180	< 74	< 360	< 74	< 74	< 180
SB166-001(22.5-23.5)	08/01/02	22.5	23.5	< 9800	**130,000**	**420,000**	< 19000	< 3900	< 3900	< 9800
SB166-002(25-26)	08/01/02	25	26	< 180	< 180	< 73	< 360	< 73	< 73	< 180
SB167-001(0-1)	08/01/02	0	1	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SB167-002(5-6)	08/01/02	5	6	< 3700	**170,000**	**360,000**	98,000	29,000	47,000	9,600
SP168-001(0-1)	08/01/02	0	1	< 210	< 210	< 83	< 410	< 83	< 83	< 210
SP168-002(3-5)	08/01/02	3	5	< 1000	< 1000	< 400	< 2000	< 400	< 400	< 1000
SB169-001(0-2)	08/01/02	0	2	< 370	< 250	< 98	< 480	< 98	< 98	< 250
SB169-002(8-9)	08/01/02	8	9	< 200	< 200	< 81	< 400	< 81	< 81	< 200
SB170-001(0-1)	08/01/02	0	1	< 240	< 240	< 95	< 470	< 95	< 95	< 240
SB170-002(4-6)	08/01/02	4	6	< 220	< 220	< 90	< 440	< 90	< 90	< 220
SB170-003(20-21)	08/01/02	20	21	< 190	< 190	< 75	< 370	< 75	< 75	< 190
SB171-001(2-3)	08/01/02	2	3	1,800	< 460	< 180	< 910	< 180	< 180	< 460
SB171-002(6-7)	08/01/02	6	7	< 250	< 250	< 100	< 490	< 100	< 100	< 250
SP172-001(2-3)	08/01/02	2	3	< 290	< 290	< 120	< 570	< 120	< 120	< 290
SP172-002(8-10)	08/01/02	8	10	< 4300	15,000	**82,000**	< 8600	< 1700	< 1700	< 4300
SP173-001(0-1)	08/01/02	0	1	< 300	< 300	< 120	< 600	< 120	< 120	< 300
SP173-002(4-6)	08/01/02	4	6	< 5600	13,000	36,000	< 11000	< 2200	< 2200	< 5600
SP173-003(8-10)	08/01/02	8	10	< 200	< 200	440	< 400	< 81	< 81	< 200
SP174-001(1-2)	08/01/02	1	2	< 190	< 190	< 77	< 380	< 77	< 77	< 190
SP174-002(6-8)	08/01/02	6	8	< 200	< 200	< 79	< 390	< 79	< 79	< 200
SB175-001(1-2)	08/01/02	1	2	< 200	< 200	190	< 400	< 82	< 82	< 200
SB175-002(7-8)	08/01/02	7	8	< 200	< 200	< 82	< 400	< 82	< 82	< 200
SB175-003(22-23)	08/01/02	22	23	< 190	< 190	< 77	< 380	< 77	< 77	< 190
SB176-001(2-3)	08/01/02	2	3	< 1800	< 1800	< 730	< 3600	< 730	< 730	< 1800
SB176-002(6-7)	08/01/02	6	7	< 200	< 200	< 79	< 390	< 79	< 79	< 200
SB177-001(0-1)	08/01/02	0	1	< 890	< 890	< 360	< 1800	< 360	< 360	< 890
SB177-002(7-8)	08/01/02	7	8	< 200	< 200	< 82	< 400	< 82	< 82	< 200
SB177-003(19-20)	08/01/02	19	20	< 180	< 180	< 71	< 350	< 71	< 71	< 180
SB178-001(0-1)	08/01/02	0	1	< 190	< 190	< 77	< 380	< 77	< 77	< 190
SB178-002(5-6)	08/01/02	5	6	< 1100	< 1100	< 450	< 2200	< 450	< 450	< 1100
SP179-001(1-2)	08/01/02	1	2	< 180	< 180	< 73	< 360	< 73	< 73	< 180
SP179-002(6-8)	08/01/02	6	8	< 200	< 200	< 79	< 390	< 79	< 79	< 200
SP180-001(2-3)	08/01/02	2	3	< 200	< 200	< 81	< 400	< 81	< 81	< 200
SP180-002(3-5)	08/01/02	3	5	< 230	< 230	< 90	< 450	< 90	< 90	< 230
SP180-003(10-12)	08/01/02	10	12	< 210	< 210	84	< 410	< 84	< 84	< 210

Notes:
1) The Risk Assessment Framework Screening Levels are a hierarchical combination of USEPA Regional Screening Levels (RSLs) and Illinois TACO Tier I values.

Table 5. Soil Results - Detected Inorganic Metals and Cyanide (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Antimony, Total	Arsenic, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Copper, Total	Cyanide, Total	Lead, Total	Mercury, Total	Nickel, Total	Selenium, Total	Silver, Total	Thallium, Total	Zinc, Total
Risk Assessment Framework Screening Levels				**31,000**	**31,000**	**160,000**	**70,000**	**120,000,000**	**3,100,000**	**1,600,000**	**400,000**	**23,000**	**1,500,000**	**390,000**	**390,000**	**6,300**	**23,000,000**
SB09-001(4-6)	08/01/02	4	6	< 1500	5,000	< 310	< 150	5,300	5,100	1,100	30,000	72	4,800	< 220	< 390	790	38,000
SB11-001(5-7)	08/01/02	5	7	< 1600	1,200	< 320	< 160	4,600	2,500	1,500	2,600	< 43	3,300	240	< 400	< 810	16,000
SB11-002(14-16)	08/01/02	14	16	< 1600	1,000	< 310	< 160	4,200	2,100	< 360	2,100	< 40	3,000	< 220	< 390	< 780	9,300
SB12-001(0-1)	08/01/02	0	1	< 1500	14,000	1,100	< 150	30,000	70,000	2,100	68,000	220	25,000	340	2,200	< 730	130,000
SB13-001(2-3)	08/01/02	2	3	< 1400	15,000	470	< 140	17,000	61,000	2,300	120,000	1,300	15,000	570	340	< 680	60,000
SB13-002(4-6)	08/01/02	4	6	< 1600	3,100	< 320	220	5,600	49,000	490	3,200	< 46	6,300	280	< 400	< 810	56,000
SB24-001(5-7)	08/01/02	5	7	< 1400	510	< 270	< 140	3,400	1,500	< 480	1,600	< 41	2,100	< 240	< 340	< 690	7,900
SB27-001(4-6)	08/01/02	4	6	< 1500	6,000	< 310	< 150	4,800	7,700	< 470	17,000	45	6,100	< 240	< 390	770	140,000
SB28-001(0-1)	08/01/02	0	1	< 1400	7,300	500	300	11,000	150,000	< 490	100,000	92	13,000	< 180	< 340	< 680	460,000
SB33-001(4-6)	08/01/02	4	6	< 2400	**220,000**	< 490	< 1200	21,000	280,000	1,100	140,000	750	8,400	< 250	< 610	1,400	220,000
SB35-001(22-23)	08/01/02	22	23	< 1600	4,200	< 310	< 160	12,000	14,000	1,000	6,700	< 36	16,000	< 180	< 390	< 790	31,000
SB42-001(6-8)	08/01/02	6	8	< 2200	15,000	1,100	270	6,300	23,000	27,000	25,000	290	9,500	< 260	< 560	< 1100	60,000
SB49-001(10-12)	08/01/02	10	12	< 2000	1,500	< 390	< 200	4,600	2,400	< 420	2,200	< 41	3,200	< 190	< 490	< 980	9,800
SP100-001(2-3)	08/01/02	2	3	< 2000	1,900	400	< 200	4,500	5,000	< 500	8,000	350	3,900	< 200	< 490	< 200	26,000
SP100-002(8-10)	08/01/02	8	10	< 2300	< 1200	520	< 230	4,100	1,300	< 360	1,900	< 20	2,700	< 230	< 580	< 230	9,800
SP100-003(6-8)	08/01/02	6	8	< 2500	3,100	1,300	< 250	7,000	17,000	1,000	2,800	< 22	9,900	750	< 630	< 260	35,000
SP101-001(1-2)	08/01/02	1	2	< 2100	1,900	510	< 210	5,900	6,700	< 460	6,700	21	5,100	< 220	< 520	< 220	45,000
SP101-002(5-7)	08/01/02	5	7	< 2500	2,500	590	< 250	5,500	3,500	< 540	5,000	< 23	6,600	310	< 630	< 240	79,000
SP102-001(2-3)	08/01/02	2	3	< 2100	1,200	810	< 210	7,000	5,400	< 450	2,900	19	7,100	< 200	< 520	< 200	53,000
SP102-002(8-10)	08/01/02	8	10	< 2200	< 1100	< 440	< 220	3,000	1,800	< 490	1,700	< 20	2,500	< 230	< 550	< 230	13,000
SP102-003(14-16)	08/01/02	14	16	< 2400	< 1200	< 470	< 240	2,800	1,400	< 490	1,700	< 21	2,100	< 240	< 590	< 240	7,900
SP103-001(1-2)	08/01/02	1	2	< 2100	7,100	730	680	8,400	22,000	1,600	290,000	190	12,000	630	< 530	< 200	190,000
SP103-002(6-8)	08/01/02	6	8	< 2300	3,400	< 460	< 230	5,000	6,000	980	31,000	190	5,400	< 230	< 580	< 230	60,000
SP103-003(24-25)	08/01/02	24	25	< 2200	< 1100	< 440	< 220	2,800	1,900	< 470	2,300	< 21	2,900	< 240	< 550	< 240	13,000
SP104-001(2-3)	08/01/02	2	3	< 2200	3,500	< 430	< 220	4,200	14,000	1,700	19,000	88	4,500	470	< 540	< 200	110,000
SP104-002(8-10)	08/01/02	8	10	< 2100	1,500	< 420	< 210	3,100	2,000	< 480	1,600	< 19	2,700	< 220	< 530	< 220	7,100
SP104-003(19-20)	08/01/02	19	20	< 2200	1,800	< 440	< 220	3,600	2,800	630	2,900	< 20	3,500	< 220	< 550	< 220	11,000
SP106-001(2-3)	08/01/02	2	3	< 2600	2,300	710	< 260	5,400	12,000	< 620	4,400	80	4,500	570	< 650	< 270	15,000
SP106-002(6-8)	08/01/02	6	8	< 2100	1,500	< 420	< 210	3,400	1,800	< 420	6,000	< 20	3,500	220	< 530	< 210	55,000
SP107-001(0-1)	08/01/02	0	1	< 2200	9,900	1,200	340	18,000	23,000	2,900	78,000	190	9,900	1,200	< 550	430	90,000
SP107-002(5-7)	08/01/02	5	7	< 2500	1,600	< 500	< 250	5,600	2,700	< 460	3,500	< 23	2,800	< 270	< 630	< 270	18,000
SB108-001(0-1)	08/01/02	0	1	< 2100	11,000	1,300	510	14,000	23,000	720	34,000	350	14,000	< 220	< 520	290	200,000
SB108-003(11-12)	08/01/02	11	12	< 2100	< 1100	< 430	< 210	4,100	2,900	< 530	1,900	< 20	3,200	< 220	< 540	< 220	35,000
SB109-001(1-2)	08/01/02	1	2	< 2000	6,300	790	240	13,000	22,000	< 470	190,000	83	11,000	250	< 490	270	110,000
SB109-002(3-4)	08/01/02	3	4	< 1900	5,100	490	300	6,400	25,000	8,400	200,000	68	5,300	710	< 470	370	110,000
SP110-001(2-3)	08/01/02	2	3	< 1900	3,300	580	< 190	6,200	6,800	< 430	23,000	56	8,000	< 210	< 460	< 210	93,000
SP110-002(6-8)	08/01/02	6	8	< 2100	< 1100	< 420	< 210	3,100	1,600	< 470	1,400	< 19	2,500	< 220	< 530	< 220	8,200
SP110-003(14-16)	08/01/02	14	16	< 1900	< 970	< 390	< 190	4,000	2,000	< 490	2,000	< 19	3,000	< 220	< 480	< 220	9,500
SP111B-001(0-1)	08/01/02	0	1	< 1900	6,400	800	< 190	19,000	18,000	860	38,000	380	18,000	340	< 480	< 220	60,000
SP111B-002(8-10)	08/01/02	8	10	< 2000	2,100	550	< 200	11,000	6,400	< 420	2,800	< 18	8,100	< 200	< 490	< 200	19,000
SP112-001(0-1)	08/01/02	0	1	2,100	4,400	620	< 210	3,300	20,000	610	14,000	110	5,400	< 1100	< 540	< 220	32,000
SP112-002(6-8)	08/01/02	6	8	< 2400	< 1200	< 480	< 240	3,000	1,700	< 480	2,700	< 20	2,700	< 230	< 610	< 230	11,000
SB113-001(0-1)	08/01/02	0	1	< 1900	11,000	1,200	820	27,000	97,000	2,200	140,000	370	14,000	< 350	< 480	330	330,000

Table 5. Soil Results - Detected Inorganic Metals and Cyanide (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Antimony, Total	Arsenic, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Copper, Total	Cyanide, Total	Lead, Total	Mercury, Total	Nickel, Total	Selenium, Total	Silver, Total	Thallium, Total	Zinc, Total
Risk Assessment Framework Screening Levels				**31,000**	**31,000**	**160,000**	**70,000**	**120,000,000**	**3,100,000**	**1,600,000**	**400,000**	**23,000**	**1,500,000**	**390,000**	**390,000**	**6,300**	**23,000,000**
SB113-002(5-6)	08/01/02	5	6	3,600	**31,000**	1,500	970	7,400	27,000	< 610	40,000	95	17,000	1,900	< 580	< 240	100,000
SB113-003(24-25)	08/01/02	24	25	< 2100	6,700	510	< 210	11,000	17,000	< 470	8,200	20	19,000	< 210	< 530	340	43,000
SB114-001(1-2)	08/01/02	1	2	< 2400	8,400	1,500	670	8,100	27,000	< 580	19,000	< 21	16,000	420	< 600	< 220	120,000
SP115-001(2-3)	08/01/02	2	3	< 2800	7,600	1,200	< 280	8,400	14,000	2,200	2,600	< 25	12,000	6,600	< 700	< 290	8,100
SP115-002(8-10)	08/01/02	8	10	< 2400	< 1200	< 490	< 240	3,300	1,600	< 450	1,700	< 20	2,600	< 240	< 610	< 240	10,000
SP115-004(17-19)	08/01/02	17	19	< 2400	1,500	< 470	< 240	3,400	2,200	< 390	2,100	< 21	3,100	< 230	< 590	< 230	9,800
SB116-001(1-2)	08/01/02	1	2	< 2500	5,900	1,100	< 250	3,700	29,000	6,300	34,000	< 22	6,100	1,600	< 620	< 250	46,000
SB116-002(7-8)	08/01/02	7	8	< 2200	< 1100	< 440	< 220	2,800	1,300	< 430	1,400	< 20	2,400	310	< 550	< 230	7,300
SP117-001(1-2)	08/01/02	1	2	< 2400	11,000	600	< 240	5,200	20,000	1,700	51,000	< 20	13,000	2,700	< 600	< 240	50,000
SP117-002(6-8)	08/01/02	6	8	< 2900	4,700	750	< 290	5,300	12,000	< 790	8,100	< 26	11,000	5,300	< 740	< 310	44,000
SP118-001(2-3)	08/01/02	2	3	< 2300	**36,000**	700	< 230	4,900	11,000	< 530	33,000	160	4,600	< 1100	< 570	1,400	65,000
SP118-002(6-8)	08/01/02	6	8	< 2200	1,500	< 450	< 220	2,100	< 1100	< 540	1,600	< 21	1,700	< 250	< 560	< 250	8,900
SB119-001(2-3)	08/01/02	2	3	< 2100	5,400	620	430	22,000	46,000	41,000	46,000	98	15,000	240	< 520	< 230	140,000
SB119-002(3-4)	08/01/02	3	4	< 2300	1,800	480	400	5,500	10,000	3,100	3,400	< 22	10,000	< 240	< 560	< 240	110,000
SB120-001(1-2)	08/01/02	1	2	< 2100	8,600	900	< 420	16,000	62,000	42,000	63,000	67	9,600	870	< 520	280	16,000
SB120-002(5-6)	08/01/02	5	6	< 2400	6,400	600	< 240	7,900	21,000	720	2,200	26	7,900	910	< 590	< 270	30,000
SB121-001(1-2)	08/01/02	1	2	< 2600	23,000	3,400	1,700	46,000	87,000	9,800	92,000	1,600	36,000	670	< 640	< 260	330,000
SB121-002(6-7)	08/01/02	6	7	< 2400	1,500	490	< 240	3,700	1,800	< 450	2,100	< 20	5,400	< 240	< 600	< 240	63,000
SB121-003(20-20.5)	08/01/02	20	20.5	< 2300	< 1200	< 470	< 230	3,400	1,900	< 420	2,100	< 21	3,100	< 230	< 580	< 230	11,000
SP122-001(2-3)	08/01/02	2	3	3,900	9,100	910	1,000	23,000	54,000	3,300	230,000	1,300	12,000	< 1100	< 550	< 1100	220,000
SP122-002(8-10)	08/01/02	8	10	< 2300	1,800	< 460	< 230	5,100	4,700	< 450	2,100	< 20	4,700	< 230	< 570	< 230	14,000
SP122-003(24-25)	08/01/02	24	25	< 2200	6,400	490	< 220	11,000	20,000	< 400	8,700	25	20,000	< 210	< 550	290	44,000
SB123-001(2-3)	08/01/02	2	3	< 2000	2,700	430	< 200	4,400	4,300	< 390	2,600	< 18	4,300	< 380	< 490	< 190	14,000
SB123-002(8-10)	08/01/02	8	10	< 2400	1,300	< 490	< 240	2,700	< 1200	< 520	1,400	< 22	1,700	< 250	< 610	< 250	11,000
SP124-001(1-2)	08/01/02	1	2	< 2000	6,900	760	< 200	4,900	55,000	1,500	26,000	42	17,000	710	< 510	< 200	47,000
SP124-002(4-6)	08/01/02	4	6	< 2400	3,100	< 470	< 240	3,500	35,000	52,000	28,000	22	17,000	1,800	< 590	< 240	37,000
SP124-003(26-27)	08/01/02	26	27	< 2200	8,000	650	< 220	13,000	21,000	< 440	9,600	27	24,000	< 210	< 550	390	46,000
SP126-001(0-1)	08/01/02	0	1	< 2100	9,600	690	370	14,000	20,000	< 530	25,000	71	22,000	< 220	< 530	420	69,000
SP126-002(5-6)	08/01/02	5	6	< 5100	28,000	< 1000	< 510	11,000	22,000	27,000	30,000	260	12,000	18,000	< 1300	< 500	71,000
SP127-001(0-1)	08/01/02	0	1	< 2200	24,000	1,400	840	17,000	40,000	15,000	150,000	240	22,000	1,500	< 540	< 230	230,000
SP127-002(5-7)	08/01/02	5	7	< 2300	3,100	< 460	< 230	2,800	2,500	2,000	3,800	78	3,000	< 220	< 580	< 220	11,000
SP128-001(1-2)	08/01/02	1	2	< 1800	3,600	570	< 180	3,900	4,600	530	7,300	140	5,100	< 980	< 460	< 200	29,000
SP128-002(8-10)	08/01/02	8	10	< 2100	< 1000	< 410	< 210	1,900	1,200	< 450	1,300	< 20	1,900	560	< 510	< 190	14,000
SB130-001(1-2)	08/01/02	1	2	2,100	**32,000**	560	1,100	12,000	12,000	1,300	120,000	1,100	6,200	< 980	< 520	< 200	190,000
SB130-002(5-6)	08/01/02	5	6	< 2400	< 1200	< 480	< 240	3,300	< 1200	< 380	2,000	< 21	1,800	< 210	< 600	< 210	9,300
SP131-001(0-1)	08/01/02	0	1	< 2500	8,900	1,100	< 250	13,000	42,000	1,800	43,000	2,500	24,000	1,200	< 620	580	61,000
SP131-002(6-8)	08/01/02	6	8	< 2200	4,100	< 440	< 220	4,200	3,000	< 580	1,600	< 20	3,400	< 230	< 550	< 230	12,000
SB132-001(0-1)	08/01/02	0	1	< 2400	16,000	3,400	510	30,000	110,000	24,000	51,000	240	24,000	740	< 600	< 230	120,000
SB132-002(7-8)	08/01/02	7	8	< 2000	< 1000	520	< 200	3,800	3,600	< 510	2,000	< 20	11,000	< 200	< 510	< 200	59,000
SP133-001(0-1)	08/01/02	0	1	2,100	8,400	1,100	1,100	11,000	19,000	7,200	54,000	400	18,000	< 1000	< 520	< 1000	460,000
SP133-002(4-6)	08/01/02	4	6	< 2300	3,000	710	< 230	6,100	19,000	830	14,000	73	7,300	< 220	< 580	< 220	180,000
SP133-003(24-25)	08/01/02	24	25	< 2000	1,600	< 400	< 200	4,400	2,700	< 370	3,500	< 19	3,700	< 210	< 500	< 210	23,000
SP133-004(26-28)	08/01/02	26	28	< 2200	5,700	520	< 220	12,000	19,000	< 420	9,000	26	20,000	< 220	< 540	490	38,000

Table 5. Soil Results - Detected Inorganic Metals and Cyanide (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Antimony, Total	Arsenic, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Copper, Total	Cyanide, Total	Lead, Total	Mercury, Total	Nickel, Total	Selenium, Total	Silver, Total	Thallium, Total	Zinc, Total
Risk Assessment Framework Screening Levels				**31,000**	**31,000**	**160,000**	**70,000**	**120,000,000**	**3,100,000**	**1,600,000**	**400,000**	**23,000**	**1,500,000**	**390,000**	**390,000**	**6,300**	**23,000,000**
SP134-001(1-2)	08/01/02	1	2	7,200	15,000	1,400	24,000	32,000	1,600,000	6,100	**3,400,000**	390	35,000	1,500	2,100	< 1300	**28,000,000**
SP134-002(5-6)	08/01/02	5	6	< 2800	19,000	< 570	< 280	4,800	8,700	28,000	8,900	690	18,000	< 1400	< 710	650	91,000
SP135-001(0-1)	08/01/02	0	1	< 3400	< 1700	< 680	< 340	7,300	4,500	1,000	32,000	60	2,900	< 380	< 850	< 380	40,000
SP135-002(8-10)	08/01/02	8	10	< 1900	1,300	< 390	< 190	3,500	1,500	< 470	2,100	< 18	2,800	< 200	< 480	< 200	9,600
SP135-003(15-16)	08/01/02	15	16	< 2200	1,200	< 440	< 220	4,200	1,500	< 550	2,300	< 19	3,100	< 220	< 550	< 220	22,000
SP136-001(2-3)	08/01/02	2	3	< 3300	13,000	720	< 330	12,000	25,000	790	52,000	210	8,400	850	< 820	< 300	79,000
SP136-002(4-6)	08/01/02	4	6	< 2800	5,600	< 550	< 280	4,500	4,500	4,500	9,400	190	3,500	2,400	< 690	650	29,000
SP136-003(29-30)	08/01/02	29	30	< 2200	6,700	480	< 220	11,000	18,000	< 320	7,800	< 18	17,000	< 210	< 540	280	29,000
SB137-001(0-1)	08/01/02	0	1	< 2000	5,800	830	300	19,000	25,000	< 440	37,000	46	26,000	< 220	< 510	350	63,000
SB137-003(26-27)	08/01/02	26	27	< 1900	6,500	590	230	12,000	21,000	< 400	8,800	23	21,000	< 200	< 480	380	39,000
SP138-001(2-3)	08/01/02	2	3	< 2300	**67,000**	2,400	1,900	20,000	62,000	15,000	83,000	590	29,000	12,000	< 570	500	900,000
SP138-002(6-8)	08/01/02	6	8	< 2400	**37,000**	1,500	300	17,000	24,000	1,200	34,000	960	16,000	1,300	< 610	550	240,000
SB139-001(2-3)	08/01/02	2	3	4,400	27,000	980	< 260	12,000	73,000	22,000	210,000	**51,000**	8,000	2,000	< 660	390	260,000
SB139-002(8-10)	08/01/02	8	10	< 2300	4,000	< 460	< 230	3,600	2,000	1,600	2,400	580	2,300	< 230	< 580	< 230	9,300
SB139-004(23-24)	08/01/02	23	24	< 2000	6,900	500	< 200	11,000	18,000	< 380	8,700	140	18,000	< 220	< 510	< 430	33,000
SB139-005(24-25)	08/01/02	24	25	< 2200	6,000	600	< 220	14,000	18,000	< 510	8,300	84	19,000	< 210	< 540	350	33,000
SP140-001(0-1)	08/01/02	0	1	< 2300	10,000	650	< 230	8,300	77,000	870	5,400	120	7,800	1,500	< 570	< 230	20,000
SP140-002(8-10)	08/01/02	8	10	< 2300	< 1200	< 470	< 230	4,300	2,200	< 500	1,800	< 20	3,900	< 220	< 580	< 220	11,000
SP141-001(1-2)	08/01/02	1	2	< 2300	6,800	650	< 230	14,000	19,000	410	40,000	240	16,000	< 230	< 570	390	56,000
SP141-002(6-8)	08/01/02	6	8	< 2400	3,100	< 470	< 240	3,200	2,400	< 460	2,200	< 20	3,400	< 230	< 590	< 230	13,000
SP141-003(18-20)	08/01/02	18	20	< 2200	1,300	< 440	< 220	4,500	2,500	< 350	2,100	< 19	3,400	< 210	< 550	< 210	11,000
SB142-001(1-2)	08/01/02	1	2	2,900	9,700	1,300	< 230	17,000	53,000	5,400	82,000	2,700	13,000	930	< 570	< 220	66,000
SB142-002(4-6)	08/01/02	4	6	< 2500	1,700	670	360	5,400	11,000	4,500	12,000	2,100	6,100	< 240	< 620	< 240	160,000
SP143-001(1-2)	08/01/02	1	2	< 2300	7,300	1,000	410	5,100	8,200	1,500	17,000	72	12,000	310	< 560	230	480,000
SP143-002(8-10)	08/01/02	8	10	< 2400	1,300	< 470	< 240	2,600	< 1200	1,700	1,500	< 21	2,100	< 220	< 590	< 220	8,300
SP143-004(26-28)	08/01/02	26	28	< 2100	5,900	530	< 210	11,000	18,000	< 520	8,400	30	18,000	< 210	< 520	430	37,000
SP144-001(2-3)	08/01/02	2	3	< 2600	17,000	930	< 260	9,000	44,000	< 610	47,000	69	16,000	1,700	< 660	770	63,000
SP144-002(8-10)	08/01/02	8	10	< 2000	< 980	< 390	< 200	3,000	2,800	3,400	1,600	< 19	2,500	380	< 490	< 210	8,400
SP145-001(0-1)	08/01/02	0	1	< 2600	4,100	< 530	< 260	8,000	22,000	1,900	36,000	74	8,400	< 550	< 660	< 270	47,000
SP145-002(4-6)	08/01/02	4	6	< 2100	1,300	< 430	< 210	3,000	1,600	1,100	1,600	39	2,300	< 210	< 530	< 210	7,600
SP145-003(23-24)	08/01/02	23	24	< 2100	1,300	< 410	< 210	3,200	2,300	< 400	2,200	< 22	2,900	< 230	< 520	< 230	27,000
SP146-001(1-2)	08/01/02	1	2	< 2200	12,000	1,200	470	8,900	58,000	1,200	48,000	59	17,000	600	< 560	710	300,000
SP146-004(29-30)	08/01/02	29	30	< 2000	6,000	580	< 200	13,000	21,000	1,700	8,800	23	21,000	310	< 500	570	35,000
SP147-001(0-1)	08/01/02	0	1	< 2000	5,900	620	310	14,000	25,000	1,500	17,000	60	18,000	< 190	< 510	< 190	78,000
SP147-002(6-8)	08/01/02	6	8	< 2700	5,900	2,400	< 270	12,000	20,000	6,000	7,900	< 23	21,000	460	< 680	< 260	130,000
SP147-003(29-30)	08/01/02	29	30	< 2200	6,900	610	< 220	13,000	30,000	< 440	10,000	25	22,000	< 210	< 540	240	51,000
SP148-001(1-2)	08/01/02	1	2	< 2300	12,000	1,100	< 230	6,800	20,000	580	8,400	1,200	8,100	1,200	< 570	< 220	15,000
SP148-002(6-8)	08/01/02	6	8	< 2300	< 1200	< 460	< 230	2,100	1,300	< 550	1,300	< 20	1,800	< 230	< 580	< 230	5,800
SP149-001(2-3)	08/01/02	2	3	< 2600	**34,000**	3,300	< 260	36,000	81,000	1,800	140,000	960	20,000	< 260	< 660	< 260	53,000
SP149-002(8-10)	08/01/02	8	10	< 2100	< 1100	< 430	< 210	2,700	4,100	< 430	2,300	< 20	2,600	< 240	< 540	< 240	14,000
SP150-001(2-3)	08/01/02	2	3	< 2500	**43,000**	820	< 250	8,900	16,000	< 460	26,000	110	11,000	780	< 620	350	67,000
SP150-002(4-6)	08/01/02	4	6	< 2400	< 1200	< 480	< 240	3,900	< 1200	< 540	1,900	< 21	3,000	< 240	< 600	< 240	20,000
SP151-001(0-1)	08/01/02	0	1	< 2100	< 1000	< 410	< 210	2,600	1,200	1,400	1,500	330	2,300	< 220	< 520	480	7,400

Table 5. Soil Results - Detected Inorganic Metals and Cyanide (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Antimony, Total	Arsenic, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Copper, Total	Cyanide, Total	Lead, Total	Mercury, Total	Nickel, Total	Selenium, Total	Silver, Total	Thallium, Total	Zinc, Total
Risk Assessment Framework Screening Levels				**31,000**	**31,000**	**160,000**	**70,000**	**120,000,000**	**3,100,000**	**1,600,000**	**400,000**	**23,000**	**1,500,000**	**390,000**	**390,000**	**6,300**	**23,000,000**
SP151-002(4-6)	08/01/02	4	6	< 2200	2,200	490	< 220	3,700	3,900	7,100	3,800	85	5,100	< 210	< 560	< 210	53,000
SP151-003(8-10)	08/01/02	8	10	< 2300	< 1200	< 470	< 230	3,100	< 1200	< 480	1,400	< 20	2,100	< 230	< 580	< 230	9,000
SP152-001(1-2)	08/01/02	1	2	< 2400	6,200	840	530	16,000	18,000	5,000	150,000	400	14,000	< 230	< 600	< 230	120,000
SP152-002(4-6)	08/01/02	4	6	< 2200	2,000	< 440	< 220	4,100	4,100	560	4,300	< 21	4,200	< 240	< 550	< 240	16,000
SP154-001(2-3)	08/01/02	2	3	26,000	29,000	< 760	670	7,400	550,000	740,000	**910,000**	2,000	< 1900	4,900	7,700	1,100	280,000
SP154-002(4-6)	08/01/02	4	6	30,000	29,000	< 730	1,900	8,600	500,000	370,000	**740,000**	960	2,800	1,000	6,000	590	680,000
SP154-003(10-12)	08/01/02	10	12	< 2000	< 1000	< 410	< 200	2,800	1,200	< 480	1,600	< 19	2,200	< 220	< 510	< 220	6,800
SP155-001(2-3)	08/01/02	2	3	< 2300	10,000	880	< 230	18,000	22,000	< 560	18,000	89	21,000	< 230	< 570	420	67,000
SP155-002(4-6)	08/01/02	4	6	< 2300	**40,000**	1,100	< 230	19,000	68,000	4,200	200,000	3,700	14,000	1,100	< 590	250	72,000
SP156-001(0-1)	08/01/02	0	1	< 3200	2,700	< 640	< 320	17,000	22,000	1,400	130,000	100	6,800	< 1800	< 800	< 360	120,000
SP156-002(8-10)	08/01/02	8	10	< 2700	6,700	790	< 270	7,500	18,000	9,100	11,000	45	18,000	3,200	< 680	< 270	27,000
SP156-003(25-26)	08/01/02	25	26	< 2100	1,300	< 420	< 210	6,400	2,000	< 340	2,600	< 19	3,400	< 220	< 530	< 220	22,000
SP157-001(0-1)	08/01/02	0	1	< 2000	9,800	720	980	57,000	27,000	< 480	27,000	260	19,000	330	640	310	110,000
SP157-002(8-10)	08/01/02	8	10	< 2600	14,000	620	< 260	6,000	33,000	31,000	48,000	760	4,800	1,100	< 660	430	16,000
SP158-001(0-1)	08/01/02	0	1	< 2200	5,400	1,500	330	16,000	22,000	1,600	40,000	400	14,000	< 220	< 550	430	130,000
SP158-002(6-8)	08/01/02	6	8	< 2800	2,700	< 550	< 280	4,000	3,400	14,000	6,200	130	3,400	430	< 690	< 330	80,000
SB159-001(1-2)	08/01/02	1	2	< 2300	7,900	630	< 230	11,000	33,000	1,100	90,000	1,100	13,000	510	< 570	250	110,000
SB159-002(6-7)	08/01/02	6	7	< 2400	< 1200	< 470	< 240	4,200	2,000	< 470	3,300	< 21	3,400	< 240	< 590	< 240	12,000
SB159-003(19-20)	08/01/02	19	20	< 2200	6,400	610	< 220	12,000	19,000	< 320	8,500	26	20,000	< 220	< 540	290	38,000
SB160-001(1-2)	08/01/02	1	2	< 2400	25,000	1,000	470	10,000	200,000	2,400	110,000	930	15,000	480	< 610	550	570,000
SB160-002(5-6)	08/01/02	5	6	< 1800	970	< 360	< 180	4,800	4,200	< 370	8,600	< 21	2,200	< 240	< 450	< 240	37,000
SB161-001(1-2)	08/01/02	1	2	< 2000	5,500	650	280	11,000	98,000	540	50,000	46	17,000	< 210	< 500	330	360,000
SB161-002(8-10)	08/01/02	8	10	< 2500	< 1200	< 500	< 250	3,500	< 1200	< 590	1,400	< 21	4,600	< 240	< 620	< 240	52,000
SB161-003(12-14)	08/01/02	12	14	< 2100	< 1000	< 410	< 210	2,800	1,400	< 460	1,500	< 20	2,800	260	< 520	< 230	16,000
SP162-001(2-3)	08/01/02	2	3	< 1900	3,300	400	< 190	8,600	12,000	< 510	11,000	21	9,400	< 200	< 480	< 200	38,000
SP163-001(1-2)	08/01/02	1	2	< 3800	< 1900	< 760	< 380	8,600	8,800	1,600	42,000	51	2,200	< 1900	< 950	< 370	52,000
SP163-002(3-5)	08/01/02	3	5	< 3600	4,200	990	< 360	7,500	9,700	1,300	13,000	58	13,000	2,500	< 900	440	350,000
SP163-003(22-24)	08/01/02	22	24	< 2300	1,600	< 460	< 230	4,900	3,000	3,400	3,100	< 20	3,500	< 230	< 580	< 230	27,000
SP164-001(2-3)	08/01/02	2	3	< 3800	< 1900	< 750	< 380	14,000	13,000	1,700	54,000	120	2,800	< 1900	< 940	< 380	63,000
SP164-002(3-5)	08/01/02	3	5	< 2800	15,000	< 560	1,300	23,000	55,000	1,100	18,000	980	3,300	820	< 700	< 280	39,000
SP165-001(0-1)	08/01/02	0	1	< 2000	5,300	770	< 200	18,000	21,000	< 450	12,000	44	22,000	< 210	< 510	240	55,000
SB166-002(25-26)	08/01/02	25	26	< 2100	7,300	500	< 210	11,000	22,000	< 520	10,000	19	20,000	200	< 530	< 200	37,000
SB167-001(0-1)	08/01/02	0	1	< 2200	10,000	920	< 460	23,000	38,000	< 530	19,000	44	41,000	< 200	< 550	400	87,000
SB167-002(5-6)	08/01/02	5	6	14,000	**130,000**	1,100	14,000	79,000	410,000	33,000	260,000	71	130,000	< 410	< 1000	< 410	950,000
SP168-001(0-1)	08/01/02	0	1	**32,000**	16,000	23,000	19,000	99,000	**14,000,000**	1,000	**5,200,000**	520	280,000	4,800	5,900	< 1200	**45,000,000**
SP168-002(3-5)	08/01/02	3	5	< 2200	10,000	1,100	610	16,000	400,000	< 480	180,000	430	23,000	< 220	< 550	< 220	690,000
SB169-001(0-2)	08/01/02	0	2	3,300	26,000	3,200	600	37,000	330,000	< 630	300,000	500	35,000	< 290	< 730	< 290	2,100,000
SB169-002(8-9)	08/01/02	8	9	< 2100	1,100	< 420	< 210	4,000	2,900	< 470	2,000	< 20	3,100	280	< 530	< 230	11,000
SB170-001(0-1)	08/01/02	0	1	< 2500	6,000	810	1,200	24,000	390,000	3,000	320,000	350	17,000	740	< 630	< 270	1,600,000
SB170-002(4-6)	08/01/02	4	6	3,100	15,000	1,200	< 270	20,000	130,000	1,100	190,000	< 23	23,000	950	< 660	320	270,000
SB170-003(20-21)	08/01/02	20	21	< 2100	11,000	480	< 210	11,000	18,000	< 550	8,500	21	17,000	< 200	< 520	460	34,000
SB171-001(2-3)	08/01/02	2	3	< 2600	7,800	660	< 260	9,800	56,000	4,800	31,000	740	7,200	1,300	< 640	< 270	16,000
SB171-002(6-7)	08/01/02	6	7	5,300	13,000	< 580	1,800	23,000	100,000	920	340,000	340	60,000	< 290	1,100	< 290	730,000

Table 5. Soil Results - Detected Inorganic Metals and Cyanide (µg/kg)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Sample Depth (ft) Top	Sample Depth (ft) Bottom	Antimony, Total	Arsenic, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Copper, Total	Cyanide, Total	Lead, Total	Mercury, Total	Nickel, Total	Selenium, Total	Silver, Total	Thallium, Total	Zinc, Total
Risk Assessment Framework Screening Levels				**31,000**	**31,000**	**160,000**	**70,000**	**120,000,000**	**3,100,000**	**1,600,000**	**400,000**	**23,000**	**1,500,000**	**390,000**	**390,000**	**6,300**	**23,000,000**
SP172-001(2-3)	08/01/02	2	3	13,000	**40,000**	1,100	520	41,000	180,000	13,000	**1,000,000**	560	27,000	4,100	2,200	450	700,000
SP172-002(8-10)	08/01/02	8	10	3,800	4,600	< 450	< 220	5,200	10,000	2,000	21,000	340	8,600	< 260	< 560	< 260	4,300,000
SP173-001(0-1)	08/01/02	0	1	< 3400	< 1700	< 690	< 340	11,000	11,000	1,700	57,000	260	2,200	< 1700	< 860	410	61,000
SP173-002(4-6)	08/01/02	4	6	< 3100	13,000	1,300	< 310	17,000	25,000	< 680	13,000	55	6,900	1,500	< 770	< 330	65,000
SP173-003(8-10)	08/01/02	8	10	< 2200	1,200	< 440	< 220	3,100	2,700	< 550	1,700	< 20	2,100	< 230	< 550	< 230	8,600
SP174-001(1-2)	08/01/02	1	2	< 2300	1,300	< 450	< 230	3,800	3,300	< 410	3,700	< 19	3,100	< 220	< 560	< 220	25,000
SP174-002(6-8)	08/01/02	6	8	< 2300	< 1200	< 460	< 230	2,800	2,200	< 510	1,900	< 20	2,500	< 240	< 580	< 240	39,000
SB175-001(1-2)	08/01/02	1	2	3,400	10,000	1,200	1,700	11,000	70,000	1,900	100,000	84	16,000	860	< 520	730	750,000
SB175-002(7-8)	08/01/02	7	8	< 2000	1,200	680	< 200	4,800	2,300	< 550	2,300	< 20	6,700	< 240	< 510	< 240	50,000
SB175-003(22-23)	08/01/02	22	23	< 2200	6,600	570	< 220	13,000	18,000	< 530	8,600	25	19,000	< 220	< 560	750	36,000
SB176-001(2-3)	08/01/02	2	3	< 1900	7,000	530	360	15,000	44,000	12,000	240,000	370	11,000	200	490	< 200	260,000
SB176-002(6-7)	08/01/02	6	7	6,100	13,000	450	380	11,000	160,000	7,300	**1,000,000**	< 20	14,000	1,800	< 480	< 230	740,000
SB177-001(0-1)	08/01/02	0	1	< 1900	6,400	730	440	29,000	170,000	< 500	92,000	160	15,000	< 200	< 490	280	490,000
SB177-002(7-8)	08/01/02	7	8	< 2300	< 1100	< 460	< 230	2,900	2,500	< 330	1,900	< 20	2,300	< 200	< 570	< 200	9,900
SB177-003(19-20)	08/01/02	19	20	< 2000	2,600	< 400	< 200	7,500	5,000	< 310	2,400	< 18	6,000	< 210	< 500	< 210	18,000
SB178-001(0-1)	08/01/02	0	1	< 2100	6,000	530	230	9,700	31,000	< 400	84,000	41	12,000	< 220	< 520	< 220	130,000
SB178-002(5-6)	08/01/02	5	6	9,900	19,000	< 1400	< 680	22,000	60,000	3,900	280,000	1,200	25,000	< 1300	< 1700	< 650	1,700,000
SP179-001(1-2)	08/01/02	1	2	< 2100	4,500	560	< 210	10,000	23,000	< 440	43,000	25	14,000	< 220	< 520	360	67,000
SP179-002(6-8)	08/01/02	6	8	< 2000	1,600	630	< 200	5,600	18,000	< 460	18,000	20	6,600	< 220	< 500	< 220	81,000
SP180-001(2-3)	08/01/02	2	3	2,500	8,200	4,100	830	9,800	50,000	21,000	150,000	900	11,000	3,100	< 550	< 230	260,000
SP180-002(3-5)	08/01/02	3	5	3,200	13,000	3,200	1,400	13,000	100,000	30,000	350,000	500	17,000	1,600	< 610	< 250	500,000
SP180-003(10-12)	08/01/02	10	12	< 2200	2,400	< 440	< 220	2,800	2,200	< 560	2,300	< 21	3,300	< 240	< 550	< 240	11,000

Notes:
1) The Risk Assessment Framework Screening Levels are a hierarchical combination of USEPA Regional Screening Levels (RSLs) and Illinois TACO Tier I values.

Table 6. Monitoring Well Construction Information
Waukegan North Plant MGP Site

Well ID	Top of Riser Elevation (ft MSL)	Ground Elevation (ft MSL)	Total Depth Below Ground Surface (ft bgs)	Length of Screen (ft)	Depth to Top of Screen (ft bgs)	Top of Screen Elevation (ft MSL)
Barr-MW1*	590.83	588.73	12.00	10.00	2.00	586.73
Barr-MW2*	591.34	589.10	12.20	10.00	2.20	586.90
Barr-MW3*	589.98	588.41	12.60	10.00	2.60	585.81
Barr-MW4*	588.71	586.80	13.00	10.00	3.00	583.80
Barr-MW4D*	588.69	586.60	26.50	5.00	21.50	565.10
MW3S	593.05	590.05	9.00	5.00	4.00	586.05
MW3D	593.04	590.04	25.50	5.00	20.50	569.54
MW4S	590.09	587.09	8.50	5.00	3.50	583.59
MW4D	590.16	587.16	24.50	5.00	19.50	567.66
MW5S	588.84	585.84	12.00	5.00	7.00	578.84
MW5D	588.82	585.82	24.50	5.00	19.50	566.32
MW6S	592.46	589.46	8.00	5.00	3.00	586.46
MW6D	592.53	589.53	23.00	5.00	18.00	571.53
MW7S	591.28	588.28	8.00	5.00	3.00	585.28
MW7D	591.24	588.24	22.00	5.00	17.00	571.24
MW8S	592.22	589.22	9.00	5.00	4.00	585.22
MW8D	592.23	589.23	23.50	5.00	18.50	570.73
MW9S	590.17	587.17	8.00	5.00	3.00	584.17
MW9D	590.17	587.17	25.50	5.00	20.50	566.67
MW10S	592.60	589.60	8.00	5.00	3.00	586.60
MW10D	592.56	589.56	26.00	5.00	21.00	568.56
MW11S	591.76	588.76	8.00	5.00	3.00	585.76
MW11D	591.69	588.69	23.00	5.00	18.00	570.69
MW12S	589.46	586.46	8.00	5.00	3.00	583.46
MW12D	589.61	586.61	19.00	5.00	14.00	572.61
MW13S	591.50	588.50	8.50	5.00	3.50	585.00
MW13D	591.63	588.63	24.00	5.00	19.00	569.63
MW14S	588.96	585.96	8.00	5.00	3.00	582.96
MW14D	588.91	585.91	23.00	5.00	18.00	567.91
MW15S	588.85	585.85	8.00	5.00	3.00	582.85
MW15D	588.54	585.54	24.00	5.00	19.00	566.54
MW16S	590.70	587.70	9.00	5.00	4.00	583.70
MW16D	590.74	587.74	20.50	5.00	15.50	572.24

Notes:

1) Monitoring well top of riser elevation data were taken from Burns & McDonnell (Table 3, SSWP Revision 0) and will be confirmed through survey of all new sampling points.
2) Monitoring well ground elevation, total depth below ground surface, length of screen, depth to top of screen and top of screen elevation data were determined using Burns & McDonnell Well Construction Diagrams.
3) * Monitoring well ground elevation, total depth below ground surface, length of screen, depth to top of screen and top of screen elevation data were taken from BARR (Table 4, EOC Study February 1994).

Table 7. Groundwater Elevations - August and October 2004
Waukegan North Plant MGP Site

Well ID	Top of Riser Elevation (ft MSL)	August 2004		October 2004	
		Depth to Water (ft)	Groundwater Elevation (ft MSL)	Depth to Water (ft)	Groundwater Elevation (ft MSL)
Barr-MW1	590.83	6.98	583.85	9.59	581.24
Barr-MW2	591.34	7.15	584.19	9.48	581.86
Barr-MW3	589.98	---	---	9.01	580.97
Barr-MW4	588.71	---	---	7.23	581.48
Barr-MW4D	588.69	---	---	7.21	581.48
MW3S	593.05	8.18	584.87	10.60	582.45
MW3D	593.04	8.29	584.75	10.66	582.38
MW4S	590.09	6.48	583.61	9.13	580.96
MW4D	590.16	6.53	583.63	9.08	581.08
MW5S	588.84	10.40	578.44	12.07	576.77
MW5D	588.82	10.32	578.50	11.81	577.01
MW6S	592.46	8.18	584.28	10.54	581.92
MW6D	592.53	8.28	584.25	10.58	581.95
MW7S	591.28	6.41	584.87	8.47	582.81
MW7D	591.24	6.39	584.85	8.44	582.80
MW8S	592.22	7.49	584.73	9.62	582.60
MW8D	592.23	7.51	584.72	9.64	582.59
MW9S	590.17	6.59	583.58	---	---
MW9D	590.17	6.63	583.54	---	---
MW10S	592.60	8.37	584.23	10.34	582.26
MW10D	592.56	8.40	584.16	10.32	582.24
MW11S	591.76	7.31	584.45	9.15	582.61
MW11D	591.69	7.18	584.51	9.08	582.61
MW12S	589.46	4.97	584.49	6.60	582.86
MW12D	589.61	5.12	584.49	6.78	582.83
MW13S	591.50	7.19	584.31	8.90	582.60
MW13D	591.63	7.33	584.30	9.02	582.61
MW14S	588.96	5.61	583.35	7.14	581.82
MW14D	588.91	5.61	583.30	7.08	581.83
MW15S	588.85	5.85	583.00	7.01	581.84
MW15D	588.54	5.53	583.01	6.70	581.84
MW16S	590.70	6.60	584.10	8.07	582.63
MW16D	590.74	6.85	583.89	8.11	582.63

Notes:
1) Groundwater measurements collected by Burns & McDonnell (2004).

Table 8. Summary Statistics for Groundwater Results (Detected Parameters)
Waukegan North Plant MGP Site

Parameter	RAF Screening Levels (µg/L)	Minimum Conc. (µg/L)	Maximum Conc. (µg/L)	Number of Analyzed Samples	Samples Exceeding the MDL	Samples (& %) Exceeding the RAF Screening Levels	
Parameters that Exceeded the Risk Assessment Framework Screening Levels							
Volatile Organic Compounds (VOCs)							
Benzene	5.0	2.6	3100	35	9	8	22.9%
cis-1,2-Dichloroethene	70	1.9	2400	35	7	1	2.9%
Vinyl Chloride	2.0	3.9	3.9	35	1	1	2.9%
Semi-Volatile Organic Compounds (SVOCs)							
Benzo(a)anthracene	0.13	0.14	21	35	13	13	37.1%
Benzo(a)pyrene	0.20	0.23	19	35	16	16	45.7%
Benzo(b)fluoranthene	0.18	0.22	14	35	13	13	37.1%
Benzo(k)fluoranthene	0.17	0.21	8.6	35	14	14	40.0%
Bis(2-ethylhexyl)phthalate	6.0	11	150	35	5	5	14.3%
Chrysene	1.5	0.99	24	35	8	6	17.1%
Dibenz(a,h)anthracene	0.30	0.23	2.9	35	9	6	17.1%
Dibenzofuran	37	2.5	54	35	7	1	2.9%
Indeno(1,2,3-cd)pyrene	0.43	0.21	6.8	35	10	8	22.9%
Naphthalene (SVOC)	140	1.3	660	35	11	1	2.9%
Inorganic Compounds/Elements							
Arsenic, Total	10	16	140	35	4	4	11.4%
Chromium, Total	100	13	990	35	8	1	2.9%
Lead, Total	7.5	5.3	150	35	15	13	37.1%
Cyanide (Amenable)	200.0	10	220	35	16	1	2.9%

Table 8. Summary Statistics for Groundwater Results (Detected Parameters)
Waukegan North Plant MGP Site

Parameter	RAF Screening Levels (µg/L)	Minimum Conc. (µg/L)	Maximum Conc. (µg/L)	Number of Analyzed Samples	Samples Exceeding the MDL	Samples (& %) Exceeding the RAF Screening Levels	
Parameters Detected but Below the Risk Assessment Framework Screening Levels							
Volatile Organic Compounds (VOCs)							
1,1-Dichloroethane	700	1.3	85	35	3	0	---
Ethylbenzene	700	1.4	490	35	8	0	---
Toluene	1,000	1.6	69	35	4	0	---
Xylenes, Total	10,000	1.6	100	35	8	0	---
Semi-Volatile Organic Compounds (SVOCs)							
2,4-Dimethylphenol	140	77	77	35	1	0	---
2-Methylnaphthalene	150	0.53	130	35	8	0	---
4-Methylphenol	NS	5.3	5.3	35	1	0	---
Acenaphthene	420	1.7	110	35	10	0	---
Acenaphthylene	2,200	2.2	64	35	7	0	---
Anthracene	2,100	1.6	27	35	8	0	---
Benzo(ghi)perylene	1,100	1.1	9.6	35	6	0	---
Carbazole	NS	7.1	12	35	3	0	---
Fluoranthene	280	1.5	36	35	9	0	---
Fluorene	280	5.9	56	35	8	0	---
Phenanthrene	11,000	1.4	79	35	10	0	---
Phenol	100	89	89	35	1	0	---
Pyrene	210	2.2	52	35	9	0	---
Inorganic Compounds/Elements							
Copper, Total	650	12	130	35	12	0	---
Mercury, Total	2.0	0.2	0.52	35	10	0	---
Nickel, Total	100	10	29	35	4	0	---
Zinc, Total	5,000	21	1300	35	16	0	---

Notes:

1) NS - There is no Risk Assessment Framework Screening Level for this Parameter.

Table 9. Groundwater Results - Detected Volatile Organic Compounds (µg/L)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Benzene	cis-1,2-Dichloroethene	1,1-Dichloroethane	Ethylbenzene	Toluene	Vinyl Chloride	Xylenes, Total
Risk Assessment Framework Screening Levels		**5**	**70**	**700**	**700**	**1,000**	**2**	**10,000**
Barr-MW1-001	08/13/04	**34**	< 1	< 1	210	1.6	< 1	23
Barr-MW2-001	08/13/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barr-MW3-001	10/15/04	< 1	1.9	< 1	< 1	< 1	**3.9**	< 1
Barr-MW4-001	10/15/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Barr-MW4D-001	10/15/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW3S-001	08/11/04	2.6	< 1	< 1	1.4	< 1	< 1	6.2
MW3D-001	08/11/04	**5.9**	7.2	< 1	18	< 1	< 1	12
MW4S-001	08/11/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW4D-001	08/11/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW5S-001	08/12/04	**17**	< 5	< 5	93	< 5	< 5	48
MW5D-001	08/12/04	< 10	**2100**	85	< 10	< 10	< 10	< 10
MW5D-101	08/12/04	< 10	**2400**	84	< 10	< 10	< 10	< 10
MW6S-001	08/11/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW6D-001	08/11/04	**160**	6.2	1.3	3.4	< 1	< 1	2.2
MW7S-001	08/11/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW7D-001	08/11/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW8S-001	08/11/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW8D-001	08/11/04	< 1	2	< 1	< 1	< 1	< 1	< 1
MW9S-001	08/13/04	**110**	< 10	< 10	85	69	< 10	100
MW9D-001	08/13/04	**3100**	< 10	< 10	490	18	< 10	64
MW10S-001	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW10D-001	08/12/04	**10**	< 1	< 1	4.5	1.7	< 1	1.6
MW11S-001	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW11S-101	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW11D-001	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW12S-001	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW12D-001	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW13S-001	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW13D-001	08/12/04	< 1	2.2	< 1	< 1	< 1	< 1	< 1
MW14S-001	08/13/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW14D-001	08/13/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW15S-001	08/13/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW15D-001	08/13/04	**6.3**	< 1	< 1	< 1	< 1	< 1	< 1
MW16S-001	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1
MW16D-001	08/12/04	< 1	< 1	< 1	< 1	< 1	< 1	< 1

Notes:

1) The Risk Assessment Framework Screening Levels are a hierarchical combination of USEPA Maximum Contaminant Levels, Illinois TACO Tier I values, and USEPA Regional Screening Levels (RSLs).

Table 10. Groundwater Results - Detected Polynuclear Aromatic Hydrocarbons (µg/L)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(ghi)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene
Risk Assessment Framework Screening Levels		**420**	**2,200**	**2,100**	**0.13**	**0.20**	**0.18**	**1100**	**0.17**	**1.5**	**0.30**	**280**	**280**	**0.43**	**150**	**140**	**11,000**	**210**
Barr-MW1-001	08/13/04	72	3	3.1	**0.23**	**0.33**	**0.25**	< 1	< 0.17	< 0.5	0.33	1.5	19	0.35	< 0.5	2	11	2.2
Barr-MW2-001	08/13/04	25	11	< 1	**0.66**	**1**	**0.75**	1.1	**0.54**	0.99	0.63	1.8	5.9	**0.85**	< 0.5	< 1	2.1	2.2
Barr-MW3-001	10/15/04	< 1	< 1	< 1	< 0.13	< 0.2	< 0.18	< 1	< 0.17	< 0.5	< 0.2	< 1	< 1	< 0.2	< 0.5	< 1	< 1	< 1
Barr-MW4-001	10/15/04	< 1.1	< 1.1	< 1.1	< 0.14	< 0.21	< 0.19	< 1.1	< 0.18	< 0.53	< 0.21	< 1.1	< 1.1	< 0.21	< 0.53	< 1.1	< 1.1	< 1.1
Barr-MW4D-001	10/15/04	< 0.99	< 0.99	< 0.99	< 0.13	< 0.2	< 0.18	< 0.99	< 0.17	< 0.5	< 0.2	< 0.99	< 0.99	< 0.2	< 0.5	< 0.99	< 0.99	< 0.99
MW3S-001	08/11/04	4.8	13	12	**21**	**19**	**14**	9.6	**8.6**	**24**	2.9	36	23	**6.8**	24	24	48	52
MW3D-001	08/11/04	< 1	< 1	< 1	< 0.13	< 0.2	< 0.18	< 1	< 0.17	< 0.51	< 0.2	< 1	< 1	< 0.2	2.6	8.5	< 1	< 1
MW4S-001	08/11/04	20	< 1	< 1	< 0.13	< 0.2	< 0.18	< 1	< 0.17	< 0.51	< 0.2	< 1	< 1	< 0.2	< 0.51	< 1	< 1	< 1
MW4D-001	08/11/04	< 1	< 1	< 1	< 0.13	< 0.2	< 0.18	< 1	< 0.17	< 0.51	0.23	< 1	< 1	< 0.2	< 0.51	< 1	< 1	< 1
MW5S-001	08/12/04	110	2.3	8.8	**1.6**	**1.1**	**0.73**	< 0.97	**0.38**	**1.8**	< 0.19	4	28	< 0.19	0.98	8.1	21	6.3
MW5D-001	08/12/04	< 1	< 1	< 1	**0.14**	**0.31**	**0.29**	< 1	**0.27**	< 0.52	< 0.21	< 1	< 1	< 0.21	< 0.52	< 1	< 1	< 1
MW5D-101	08/12/04	< 1	< 1	< 1	< 0.13	**0.23**	< 0.19	< 1	**0.21**	< 0.52	< 0.21	< 1	< 1	< 0.21	< 0.52	< 1	1.4	< 1
MW6S-001	08/11/04	< 1	< 1	< 1	**0.41**	**0.37**	**0.22**	< 1	**0.21**	< 0.51	< 0.2	< 1	< 1	< 0.2	< 0.51	< 1	< 1	< 1
MW6D-001	08/11/04	< 1	< 1	< 1	**0.16**	**0.24**	< 0.18	< 1	**0.22**	< 0.51	< 0.2	< 1	< 1	0.21	< 0.51	< 1	< 1	< 1
MW7S-001	08/11/04	< 0.97	< 0.97	< 0.97	< 0.13	< 0.19	< 0.17	< 0.97	< 0.17	< 0.49	< 0.19	< 0.97	< 0.97	< 0.19	< 0.49	< 0.97	< 0.97	< 0.97
MW7D-001	08/11/04	< 1	< 1	< 1	< 0.13	< 0.2	< 0.18	< 1	< 0.17	< 0.51	< 0.2	< 1	< 1	< 0.2	< 0.51	< 1	< 1	< 1
MW8S-001	08/11/04	< 1	< 1	1.6	**3.9**	**2.8**	**2.8**	1.3	**1.8**	**3.7**	0.65	8.6	< 1	**1.1**	< 0.51	< 1	9	6.4
MW8D-001	08/11/04	< 1	< 1	< 1	< 0.13	< 0.2	< 0.18	< 1	< 0.17	< 0.51	< 0.2	< 1	< 1	< 0.2	< 0.51	< 1	< 1	< 1
MW9S-001	08/13/04	22	64	12	**1.5**	**1.2**	**0.88**	< 1	**0.61**	1.4	0.61	6.2	42	**0.75**	130	**660**	55	8.1
MW9D-001	08/13/04	< 1	2.2	< 1	< 0.13	**0.47**	**0.41**	< 1	**0.45**	< 0.5	0.75	< 1	< 1	**0.75**	4.3	15	< 1	< 1
MW10S-001	08/12/04	< 1	< 1	< 1	**0.21**	**0.26**	**0.23**	< 1	< 0.18	< 0.52	< 0.21	< 1	< 1	< 0.21	< 0.52	< 1	< 1	< 1
MW10D-001	08/12/04	< 1	< 1	< 1	< 0.13	< 0.21	< 0.19	< 1	< 0.18	< 0.52	< 0.21	< 1	< 1	< 0.21	< 0.52	< 1	< 1	< 1
MW11S-001	08/12/04	4.2	< 1	6.3	**3.9**	**3.2**	**3.5**	1.7	**2.5**	**4**	0.29	9.8	20	**1.4**	0.84	3.7	28	7.4
MW11S-101	08/12/04	3.4	< 1	5.1	**3.3**	**2.7**	**3**	1.5	**2.2**	**3.5**	< 0.2	8.7	17	**1.2**	0.53	1.7	21	7.1
MW11D-001	08/12/04	< 1.1	< 1.1	< 1.1	< 0.14	< 0.21	< 0.19	< 1.1	< 0.18	< 0.53	< 0.21	< 1.1	< 1.1	< 0.21	< 0.53	1.4	< 1.1	< 1.1
MW12S-001	08/12/04	< 0.99	< 0.99	< 0.99	< 0.13	< 0.2	< 0.18	< 0.99	< 0.17	< 0.5	< 0.2	< 0.99	< 0.99	< 0.2	< 0.5	< 0.99	< 0.99	< 0.99
MW12D-001	08/12/04	< 0.99	< 0.99	< 0.99	< 0.13	< 0.2	< 0.18	< 0.99	< 0.17	< 0.5	< 0.2	< 0.99	< 0.99	< 0.2	< 0.5	< 0.99	< 0.99	< 0.99
MW13S-001	08/12/04	< 1	< 1	< 1	< 0.13	< 0.21	< 0.19	< 1	< 0.18	< 0.52	< 0.21	< 1	< 1	< 0.21	< 0.52	< 1	< 1	< 1
MW13D-001	08/12/04	< 1	< 1	< 1	< 0.14	< 0.21	< 0.19	< 1	< 0.18	< 0.52	< 0.21	< 1	< 1	< 0.21	< 0.52	< 1	< 1	< 1
MW14S-001	08/13/04	68	7.2	27	**5.6**	**3.9**	**3.6**	1.6	**3**	**5.5**	0.24	21	56	**1.3**	1.7	7.6	79	15
MW14D-001	08/13/04	< 0.99	< 0.99	< 0.99	< 0.13	**0.25**	< 0.18	< 0.99	**0.25**	< 0.5	< 0.2	< 0.99	< 0.99	< 0.2	< 0.5	1.3	< 0.99	< 0.99
MW15S-001	08/13/04	1.7	< 1	< 1	< 0.14	< 0.21	< 0.19	< 1	< 0.18	< 0.52	< 0.21	< 1	< 1	< 0.21	< 0.52	< 1	< 1	< 1
MW15D-001	08/13/04	< 1	< 1	< 1	< 0.13	< 0.21	< 0.19	< 1	< 0.18	< 0.52	< 0.21	< 1	< 1	< 0.21	< 0.52	< 1	< 1	< 1
MW16S-001	08/12/04	< 1	< 1	< 1	< 0.13	< 0.2	< 0.18	< 1	< 0.17	< 0.5	< 0.2	< 1	< 1	< 0.2	< 0.5	< 1	< 1	< 1
MW16D-001	08/12/04	< 0.99	< 0.99	< 0.99	< 0.13	< 0.2	< 0.18	< 0.99	< 0.17	< 0.5	< 0.2	< 0.99	< 0.99	< 0.2	< 0.5	< 0.99	< 0.99	< 0.99

Notes:
1) The Risk Assessment Framework Screening Levels are a hierarchical combination of USEPA Maximum Contaminant Levels, Illinois TACO Tier I values, and USEPA Regional Screening Levels (RSLs).

Table 11. Groundwater Results - Detected Semi-Volatile Organic Compounds [excluding PAHs] (µg/L)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Bis(2-ethylhexyl)phthalate	Carbazole	Dibenzofuran	2,4-Dimethylphenol	4-Methylphenol	Phenol
Risk Assessment Framework Screening Levels		**6.00**	**NS**	**37**	**140**	**NS**	**100**
Barr-MW1-001	08/13/04	< 10	< 5	3.1	< 10	< 2	< 5
Barr-MW2-001	08/13/04	**11**	< 5	< 2	< 10	< 2	< 5
Barr-MW3-001	10/15/04	< 10	< 5	< 2	< 10	< 2	< 5
Barr-MW4-001	10/15/04	< 18	< 5.3	< 2.1	< 11	< 2.1	< 5.3
Barr-MW4D-001	10/15/04	< 9.9	< 5	< 2	< 9.9	< 2	< 5
MW3S-001	08/11/04	< 10	< 5.1	2.5	< 10	< 2	< 5.1
MW3D-001	08/11/04	< 10	< 5.1	< 2	< 10	< 2	< 5.1
MW4S-001	08/11/04	**150**	< 5.1	< 2	< 10	< 2	< 5.1
MW4D-001	08/11/04	< 10	< 5.1	< 2	< 10	< 2	< 5.1
MW5S-001	08/12/04	< 9.7	< 4.9	7.9	< 9.7	< 1.9	< 4.9
MW5D-001	08/12/04	< 10	< 5.2	< 2.1	< 10	< 2.1	< 5.2
MW5D-101	08/12/04	< 10	< 5.2	< 2.1	< 10	< 2.1	< 5.2
MW6S-001	08/11/04	< 10	< 5.1	< 2	< 10	< 2	< 5.1
MW6D-001	08/11/04	< 10	< 5.1	< 2	< 10	< 2	< 5.1
MW7S-001	08/11/04	< 9.7	< 4.9	< 1.9	< 9.7	< 1.9	< 4.9
MW7D-001	08/11/04	< 10	< 5.1	< 2	< 10	< 2	< 5.1
MW8S-001	08/11/04	< 10	< 5.1	< 2	< 10	< 2	< 5.1
MW8D-001	08/11/04	< 10	< 5.1	< 2	< 10	< 2	< 5.1
MW9S-001	08/13/04	< 10	< 5	6.3	< 10	< 2	< 5
MW9D-001	08/13/04	< 10	< 5	< 2	77	5.3	89
MW10S-001	08/12/04	< 10	< 5.2	< 2.1	< 10	< 2.1	< 5.2
MW10D-001	08/12/04	**37**	< 5.2	< 2.1	< 10	< 2.1	< 5.2
MW11S-001	08/12/04	< 10	8.8	16	< 10	< 2.1	< 5.2
MW11S-101	08/12/04	< 10	7.1	12	< 10	< 2	< 5.1
MW11D-001	08/12/04	< 11	< 5.3	< 2.1	< 11	< 2.1	< 5.3
MW12S-001	08/12/04	< 9.9	< 5	< 2	< 9.9	< 2	< 5
MW12D-001	08/12/04	< 9.9	< 5	< 2	< 9.9	< 2	< 5
MW13S-001	08/12/04	< 10	< 5.2	< 2.1	< 10	< 2.1	< 5.2
MW13D-001	08/12/04	< 10	< 5.2	< 2.1	< 10	< 2.1	< 5.2
MW14S-001	08/13/04	< 10	12	**54**	< 10	< 2	< 5
MW14D-001	08/13/04	< 9.9	< 5	< 2	< 9.9	< 2	< 5
MW15S-001	08/13/04	< 10	< 5.2	< 2.1	< 10	< 2.1	< 5.2
MW15D-001	08/13/04	**16**	< 5.2	< 2.1	< 10	< 2.1	< 5.2
MW16S-001	08/12/04	**33**	< 5	< 2	< 10	< 2	< 5
MW16D-001	08/12/04	< 9.9	< 5	< 2	< 9.9	< 2	< 5

Notes:
1) The Risk Assessment Framework Screening Levels are a hierarchical combination of USEPA Maximum Contaminant Levels, Illinois TACO Tier I values, and USEPA Regional Screening Levels (RSLs).

Table 12. Groundwater Results - Detected Inorganic Metals and Cyanide (µg/L)
Waukegan North Plant MGP Site

Sample Label	Sample Date	Arsenic, Total	Chromium, Total	Copper, Total	Lead, Total	Mercury, Total	Nickel, Total	Zinc, Total	Cyanide, Total	Cyanide, Amenable
Risk Assessment Framework Screening Levels		**10**	**100**	**650**	**8**	**2**	**100**	**5000**	**---**	**200**
Barr-MW1-001	08/13/04	< 10	15	< 10	< 5	< 0.2	< 10	< 20	16	< 10
Barr-MW2-001	08/13/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	250	34
Barr-MW3-001	10/15/04	**72**	13	< 10	< 5	< 0.2	< 10	< 20	120	< 10
Barr-MW4-001	10/15/04	**140**	**990**	15	< 5	< 0.2	26	< 20	210	10
Barr-MW4D-001	10/15/04	**16**	< 10	< 10	< 5	< 0.2	< 10	< 20	20	150
MW3S-001	08/11/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	< 10	< 10
MW3D-001	08/11/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	< 10	< 10
MW4S-001	08/11/04	< 10	17	19	**24**	< 0.2	13	71	< 10	< 10
MW4D-001	08/11/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	< 10	< 10
MW5S-001	08/12/04	< 10	< 10	< 10	**9.6**	< 0.2	< 10	23	12	12
MW5D-001	08/12/04	< 10	< 10	< 10	< 5	0.34	< 10	< 20	10	< 10
MW5D-101	08/12/04	< 10	< 10	< 10	6.4	0.2	< 10	21	< 10	< 10
MW6S-001	08/11/04	< 10	< 10	< 10	< 5	< 0.2	< 10	42	220	64
MW6D-001	08/11/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	< 10	< 10
MW7S-001	08/11/04	**40**	33	40	**17**	0.28	< 10	97	< 10	< 10
MW7D-001	08/11/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	< 10	< 10
MW8S-001	08/11/04	< 10	17	51	**20**	0.25	29	330	230	**220**
MW8D-001	08/11/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	< 10	< 10
MW9S-001	08/13/04	< 10	< 10	< 10	< 5	< 0.2	10	< 20	340	150
MW9D-001	08/13/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	56	11
MW10S-001	08/12/04	< 10	< 10	< 10	5.3	< 0.2	< 10	58	270	82
MW10D-001	08/12/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	33	12
MW11S-001	08/12/04	< 10	< 10	26	**56**	0.52	< 10	36	350	73
MW11S-101	08/12/04	< 10	< 10	18	**43**	0.38	< 10	28	330	120
MW11D-001	08/12/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	18	< 10
MW12S-001	08/12/04	< 10	< 10	< 10	**19**	0.21	< 10	26	< 10	< 10
MW12D-001	08/12/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	< 10	< 10
MW13S-001	08/12/04	< 10	< 10	130	**150**	0.32	< 10	670	< 10	< 10
MW13D-001	08/12/04	< 10	< 10	32	**11**	< 0.2	< 10	1300	< 10	< 10
MW14S-001	08/13/04	< 10	13	17	**16**	0.38	< 10	52	390	120
MW14D-001	08/13/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	390	42
MW15S-001	08/13/04	< 10	< 10	12	**27**	< 0.2	< 10	38	350	67
MW15D-001	08/13/04	< 10	< 10	< 10	< 5	< 0.2	< 10	< 20	150	28
MW16S-001	08/12/04	< 10	14	93	**77**	0.21	< 10	270	< 10	< 10
MW16D-001	08/12/04	< 10	< 10	23	**16**	< 0.2	< 10	67	< 10	< 10

Notes:
1) The Risk Assessment Framework Screening Levels are a hierarchical combination of USEPA Maximum Contaminant Levels, Illinois TACO Tier I values, and USEPA Regional Screening Levels (RSLs).

Table 13. Sampling and Analysis Plan Summary
Waukegan North Plant MGP Site

Sample Type/Location	Proposed Number of Samples	Parameter	Method	Estimated Sample Quantity[2]	Field Duplicates[3]	Equipment Blanks[4]	MS/MSD[5]	TOTAL	Container Type	Minimum Volume	Preservation (Cool to 4° ≥ 2°C All Samples)	Holding Time from Sample Date
Solid Samples (Soil and Sediment Samples)												
Surface Soil (On MGP Property 0-1' interval)	5	BTEX	8260B	5	1	1	1	8	glass vial	2 oz.	methanol	7/28 days
		CVOCs[B]	8260B	2	1	1	1	5	glass vial	2 oz.	methanol	7/28 days
		PAHs	8270-SIM	5	1	1	1	8	amber glass	4 oz.		14/40 days
		dibenzofuran	8270C	5	1	1	1	8	amber glass	4 oz.		14/40 days
		Metals[A]	6020A	5	1	1	1	8	plastic	5 oz.		6 months
Subsurface Soil (up to three samples from each soil boring and one well nest boring)	102 (26 borings & 8 well nests)	BTEX	8260B	102	6	4	6	118	glass vial	2 oz.	methanol	7/28 days
		CVOCs[C]	8260B	30	2	1	1	34	glass vial	2 oz.	methanol	7/28 days
		PAHs	8270-SIM	102	6	4	6	118	amber glass	4 oz.		14/40 days
		dibenzofuran	8270C	102	6	4	6	118	amber glass	4 oz.		14/40 days
		Metals[A]	6020A	102	6	4	6	118	plastic	5 oz.		6 months
Subsurface Soil (Geotech)	3 spread out	Grain Size Distribution	ASTM D421/D422	up to 3	0	0	0	up to 3	5 gal bucket	5 gal		
		Moisture Content	ASTM D2216	up to 3	0	0	0	up to 3	from 5 gal bucket	---		
		Bulk Density	ASTM D2937	up to 3	0	0	0	up to 3	Undisturbed	Shelby		
		Spec Gravity of Soil	ASTM D854	up to 3	0	0	0	0	Sample (from	Shelby		
		Permeability (Clay)	ASTM E2396-05	2	0	0	0	2	Shelby Tube)	Shelby		
Sediment (three samples from former tat pit)	3	BTEX	8260B	3	1	1	1	6	glass vial	2 oz.	methanol	7/28 days
		CVOCs	8260B	3	1	1	1	6	glass vial	2 oz.	methanol	7/28 days
		PAHs	8270-SIM	3	1	1	1	6	amber glass	4 oz.		14/40 days
		dibenzofuran	8270C	3	1	1	1	6	amber glass	4 oz.		14/40 days
		Metals[A]	6020A	3	1	1	1	6	plastic	5 oz.		6 months
		Physical[I]		3	0	0	0	3	plastic	3 liters		
Liquid Samples (Groundwater and Surface Water Samples)												
Groundwater - wells[1] (Up to 49 wells to be sampled on a quarterly basis)	196 (for all 4 quarters. Only one quarter of sampling needs are listed).	BTEX	8260B	49	5	1	3	58	glass vial	2-40 ml	HCl to pH<2, Zero Hsp[7]	14 days
		CVOCs[D]	8260B	11	2	1	1	15	glass vial	2-40 ml	HCl to pH<2, Zero Hsp[7]	14 days
		PAHs	8270-SIM	49	5	1	3	58	amber glass	1 liter		14 days
		B2EHP[E] & dibenzofuran	8270C	49	5	1	3	58	amber glass	1 liter		14 days
		Available Cyanide	OIA-1677	49	5	1	3	58	plastic	500 ml	NaOH ≥ 12	14 days
		Metals[F]	6020A	49	5	1	3	58	plastic	500 ml	HNO3 to pH<2	6 months
		Field Parameters[G]	Field	49	0	0	0	49	field measured			
Groundwater - Borings (grab sample from three borings on Parcel 3)	3	BTEX	8260B	3	1	1	1	6	glass vial	2-40 ml	HCl to pH<2, Zero Hsp[7]	14 days
		PAHs	8270-SIM	3	1	1	1	6	amber glass	1 liter		14 days
		B2EHP[E] & dibenzofuran	8270C	3	1	1	1	6	amber glass	1 liter		14 days
		Available Cyanide	OIA-1677	3	1	1	1	6	plastic	500 ml	NaOH ≥ 12	14 days
		Metals[F]	6020A	3	1	1	1	6	plastic	500 ml	HNO3 to pH<2	6 months
Surface Water (three samples from former tar pit)	3	BTEX	8260B	3	1	1	1	6	glass vial	2-40 ml	HCl to pH<2, Zero Hsp[7]	14 days
		CVOCs	8260B	3	1	1	1	6	glass vial	2-40 ml	HCl to pH<2, Zero Hsp[7]	14 days
		PAHs	8270-SIM	3	1	1	1	6	amber glass	1 liter		14 days
		B2EHP[E] & dibenzofuran	8270C	3	1	1	1	6	amber glass	1 liter		14 days
		Metals[F]	6020A	3	1	1	1	6	plastic	500 ml	HNO3 to pH<2	6 months
		Field Parameters[G]	Field	3	0	0	0	3	field measured			

Table 13. Sampling and Analysis Plan Summary
Waukegan North Plant MGP Site

Sample Type/Location	Proposed Number of Samples	Parameter	Method	Estimated Sample Quantity[2]	Field Duplicates[3]	Equipment Blanks[4]	MS/MSD[5]	TOTAL	Container Type	Minimum Volume	Preservation (Cool to 4° ≥ 2°C All Samples)	Holding Time from Sample Date
Soil Vapor Samples												
Soil Gas (Human Health Risk Assessment [HHRA] Soil Vapor Pathway)	20 (2 points/loc. and 2 rounds)	VOCs[H] + naphthalene	TO-15	20	--	--	--	36	Summa Canister	<1 L	--	30 days
		Oxygen	ASTM D1946 or EPA 3C	20	--	--	--	36				
		Carbon Dioxide		20	--	--	--	36				
		Methane		20	--	--	--	36				
Waste Characterization Samples (Soil Cutting and Well Development/Purge Water Samples)												
Soil	1	Protocol B	Various	Composite	NA	NA	NA	NA	As Required for Analysis (check with landfill and laboratory)			
Water (Well Dev./Purge and Decon. Water)	1	Protocol B or Analysis Required by local POTW	Various	Composite	NA	NA	NA	NA	As Required for Analysis (check with landfill and laboratory)			

Notes:

A) Metals for soil analysis include antimony, arsenic, copper, lead, mercury, and zinc.
B) The CVOCs cis-1,2-dichloroethene and vinyl chloride will be analyzed in two locations in northeast corner of former MGP property.
C) The CVOCs cis-1,2-dichloroethene and vinyl chloride will be analyzed in 10 borings/wells on northeast corner of site (5 north of Dahringer Road and 5 east of Parcel 4).
D) The CVOCs cis-1,2-dichloroethene and vinyl chloride will be analyzed in 11 wells in the northeast corner of the site.
E) B2EHP is bis(2-ethylhexyl)phthalate
F) Metals for groundwater and surface water analysis include dissolved arsenic, dissolved chromium, and dissolved lead (20% of chromium samples will be analyzed for hexavalent chromium in the first quarter sampling event).
G) Field parameters include temperature, pH, specific conductivity, oxidation-reduction potential, turbidity and dissolved oxygen.
H) Vapor VOCs include BTEX, cis-1,2-dichloroethene, 1,1-dichloroethane, vinyl chloride, acetone, carbon disulfide, methyl ethyl ketone (MEK), styrene, and 1,2,4-trimethylbenzene.
I) Physical parameters for sediment include TOC, grain size distribution and percent solids.

1. Groundwater monitoring will be quarterly for one year. It will include the existing (18 shallow and 15 deep) and new (8 shallow and 8 deep) wells. Wells containing measurable DNAPL will not be sampled.
2. Estimated number of samples does not include contingency investigation locations.
3. Field duplicates will be collected at a frequency of one per group of ten or fewer water samples and one per group of twenty or fewer soil samples.
4. Equipment blanks will be collected at a frequency of one per sampling day with non-dedicated sampling equipment.
5. Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples will be collected at a frequency of one per group of twenty or fewer water samples. Additional volume will be determined per laboratory requirements.
6. Trip blanks will accompany each cooler containing VOC water samples, including equipment blanks.
7. "Zero Hsp" is Zero Headspace for water BTEX/CVOC analyses.