

**Natural  
Resource  
Technology, Inc.**

December 4, 1998  
(1313)

Ms. Margaret M. Graefe  
Wisconsin Department of Natural Resources  
Southeast Region Headquarters  
2300 N. Dr. Martin Luther King Jr. Drive  
PO Box 12436  
Milwaukee, Wisconsin 53177

RE: Transmittal, Feasibility Study Work Plan  
Campmarina, Former Coal Gas Facility  
Wisconsin Public Service Corporation  
Sheboygan, Wisconsin

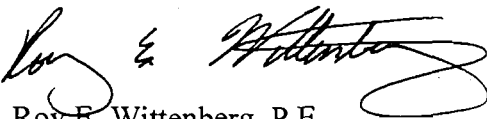
Dear Ms. Graefe:

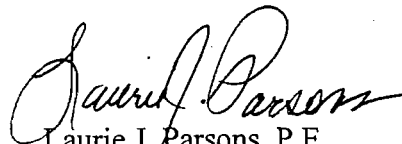
On behalf of the Wisconsin Public Service Corporation (WPS), enclosed is one copy of the Feasibility Study Work Plan for the Campmarina, Former Coal Gas Facility located in Sheboygan, Wisconsin. Field activities are scheduled for this month and the results will be used to prepare a Feasibility Study (FS). The FS will address land based (soil and groundwater) remedial recommendations and is scheduled for completion and submittal to the WDNR during the Spring of 1999.

If you have any questions or if you require additional copies for your files, please contact Ms. Connie Lawniczak of WPS at (920) 433-1176.

Sincerely,

NATURAL RESOURCE TECHNOLOGY

  
Roy E. Wittenberg, P.E.  
Senior Engineer

  
Laurie J. Parsons, P.E.  
Project Manager

Enclosure: Feasibility Study Work Plan (1 copy)

cc: Ms. Connie Lawniczak, WPS (1 copy)  
Mr. Bob Peterson, City of Sheboygan (1 copy)  
Mr. Mark Thimke, Foley & Lardner, (1 copy)

[feasibility study/1313 WDNR 98.12.4.trnsltr]

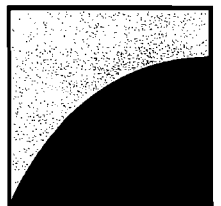
**WISCONSIN PUBLIC SERVICE CORPORATION  
SHEBOYGAN, WI**

**FEASIBILITY STUDY WORK PLAN**

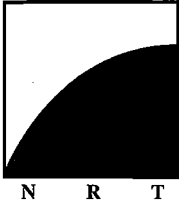
**CAMPMARINA, FORMER COAL GAS FACILITY  
WISCONSIN PUBLIC SERVICE CORPORATION  
SHEBOYGAN, WISCONSIN**

**PROJECT NO. 1313**

**Natural  
Resource  
Technology**



**N R T**



**Natural  
Resource  
Technology, Inc.**

**FEASIBILITY STUDY WORK PLAN  
CAMPMARINA, FORMER COAL GAS FACILITY  
WISCONSIN PUBLIC SERVICE CORPORATION  
SHEBOYGAN, WISCONSIN**

**Project No: 1313**

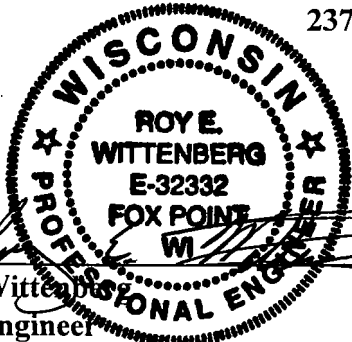
**Prepared For:**

**Wisconsin Public Service Corporation  
700 N. Adams Street  
Green Bay, WI 54307**


**Prepared By:**

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

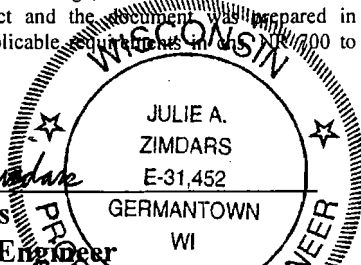
**December 4, 1998**

  
**Roy E. Wittenberg**  
**Senior Engineer**

"I, Roy E. Wittenberg, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

  
**Rebecca J. Koepke**  
**Hydrogeologist**

"I, Rebecca J. Koepke, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

  
**Julie A. Zimdars**  
**Environmental Engineer**

"I, Julie A. Zimdars, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."



4.3 Soil Borings .....4-2

4.3.1 Additional Investigation .....4-2

4.3.2 Geotechnical Borings and Testing .....4-3

4.3.3 Soil Treatability .....4-5

4.4 Monitoring Well and Piezometer Installation .....4-5

4.5 Groundwater Monitoring and Sampling .....4-6

5.0 FEASIBILITY STUDY .....5-1

6.0 QUALITY ASSURANCE .....6-1

6.1 Investigation Procedures .....6-1

6.2 Equipment Decontamination .....6-1

6.3 Cross-Contamination .....6-1

6.4 Laboratory Quality Assurance .....6-2

6.4.1 Laboratory Analysis .....6-2

6.4.2 Quality Control Samples .....6-2

6.5 Waste Management Plan .....6-3

6.6 Health and Safety Plan .....6-3

**FIGURES**

Figure 1 Site Location Map

Figure 2 Site Plan

Figure 3 Investigation Plan

**TABLES**

Table 1 Soil and Groundwater Sampling Locations and Parameters

**APPENDICES**

Appendix A: April 4, 1996 Soil Boring Logs, Borehole abandonment Forms and Laboratory Analytical Data

Appendix B: Phase I, II, and Off-Site Investigation

Appendix C: NRT Standard Practices Manual Table of Contents

**PLATE**

Plate 1 Base Map

# EXECUTIVE SUMMARY

---

This Feasibility Study Work Plan (Work Plan) has been prepared for the Wisconsin Public Service Corporation (WPS) to address feasibility study data collection objectives at the former coal gas facility located at Campmarina in Sheboygan, Wisconsin. Data collection objectives were established on the basis of the recommendations contained in the 1996 Phase II Environmental Site Investigation Report and off-site investigations performed in 1998. Remedial considerations for addressing manufactured gas plant (MGP) impacted soil and groundwater at the site include targeted excavation of source materials combined with capping and hydraulic containment. Hydraulic containment may include a combination of groundwater recovery with aboveground treatment and the installation of a vertical hydraulic barrier. Implementation of hydraulic containment will likely be proposed to control MGP impacted shallow groundwater flow to the Sheboygan River.

Key data collection objectives include further defining the extent of tar impacts, investigating the northern former gas holders and the vacant land south of the site, developing geotechnical design parameters to preliminarily determine the estimated depth and alignment for possible barrier options and conducting geotechnical strength and stability evaluations of the shallow fill/clay materials and deeper native clay present at the site. Soil treatability evaluations will also be conducted to address off-site treatment and/or disposal capabilities and cost. Off-site treatment is likely as the site has limited space.

The results of the additional investigative activities will be used to prepare a Feasibility Study (FS) in accordance with NR 722. Source control and groundwater remedial alternatives will be developed and evaluated based on effectiveness, practicality and cost.

# 1 INTRODUCTION

---

## 1.1 Overview

Presented in this document is a Feasibility Study Work Plan (Work Plan) for Wisconsin Public Service Corporation's (WPS's) former coal gas facility located at Campmarina in Sheboygan, Wisconsin (Figure 1). Tasks outlined in this work plan specifically address data collection requirements necessary for preparing a Feasibility Study (FS) for a land based remedial program associated with manufactured gas plant (MGP) impacted soil and groundwater. This Work Plan was developed on the basis of recommendations presented in the Phase II Environmental Site Investigation Report, dated June 28, 1996, and the letter report to the City of Sheboygan, dated September 15, 1998, discussing off-site MGP impacts within the Center Avenue right-of-way located directly south of the former coal gas facility.

Incorporated by reference as part of this Work Plan, are applicable requirements of NR 716 and recommended procedures from the Wisconsin Department of Natural Resources (WDNR) publication SW-157-92 entitled "Guidance for Conducting Environmental Response Actions" (March, 1992). The plan is being submitted for WDNR review and approval in substantive conformance with the contract between WPS, the City of Sheboygan and the WDNR dated March 5, 1991 (Contract No. SF-91-04). Field activities are planned for implementation in December 1998.

A land based remedial program will require consideration with respect to the planned future use for the former MGP site and vicinity. The City has developed long term development plans that include a condominium complex, park and river walk. Remedial options to be considered as part of the FS will be evaluated on the basis of a number of parameters including viability, practicality and cost effectiveness with respect to being integrated with the City's long term development plans and mitigating potential direct contact exposure.

The Work Plan project principals include the following:

Site Owner: City of Sheboygan  
807 Center Avenue  
Sheboygan, WI 53081  
Contact: Mr. Bob Peterson  
(920) 459-3380

Former MGP Operator: Wisconsin Public Service Corporation  
700 North Adams Street, P. O. Box 19002  
Green Bay, WI 54307-9002  
Contact: Ms. Connie Lawniczak  
(920) 433-1140

Site Location (Figure 1): 732 North Water Street  
Sheboygan, Wisconsin  
Sheboygan County  
NW ¼, SW ¼, Section 23, T15N, R23E  
Refer to Figure 1

Consultant: Natural Resource Technology, Inc.  
23713 West Paul Road  
Pewaukee, WI 53072  
Contact: Mr. Robert Karnauskas/Ms. Laurie Parsons  
(414) 523-9000

The site is approximately 1.5 acres in size and is bounded on the north by New York Avenue, on the east by North Water Street, on the west by the Sheboygan River, and on the south by Center Street.

## 1.2 Current Site Conditions

The former MGP is located on property owned by the City of Sheboygan that is a designated recreational vehicle (RV) parking area and boat launch called Campmarina (see Figure 2 and Plate 1). Campmarina is equipped with parking areas, electrical power and potable water for RV use. A docking area is also provided for recreational boat use on the Sheboygan River and access to Lake Michigan. The site is primarily covered with compacted gravel and an access



road leads from North Water Street at the north end of the site. No aboveground MGP structures remain.

Property south of Campmarina is also owned or is in the process of being sold by the City of Sheboygan and includes the area within the Center Avenue right-of-way and the property between the right-of-way and the Pennsylvania Avenue Bridge. Future development plans for these properties and Campmarina include the construction of a condominium complex, a river walk and a park. The condominium complex will consist of three buildings to be constructed south of Campmarina at the locations indicated in Figure 2. The river walk will be constructed directly along Campmarina and the future condominium complexes on an approximate 26 foot wide length of river front property to be retained by the City. The proposed park will extend north of the Center Avenue right-of way and will encompass Campmarina and additional properties to the north purchased by the City.

The City has approved sale of the property south of the right-of way to a developer and construction has been initiated for the first (Building No.1) condominium complex (Figure 2). Construction of Building Nos. 1 and 2 are slated for completion by the end of the Summer of 1999. Construction of Building No. 3 is scheduled for the Fall of 1999.

### 1.3 Previous Investigations

Previous investigations of soil, groundwater, and sediment quality on and adjacent to the former MGP site are summarized below, based upon the following reports and letters:

- Simon Hydro-Search, October 4, 1991. *Work Plan, Phase I Site Investigation, Manufactured Gas Plant Site, Sheboygan, Wisconsin*, Project No. 453114843.
- Simon Hydro-Search, June 30, 1992. *Phase I Environmental Investigation of Manufactured Gas Plant Site, Sheboygan, Wisconsin*, Project No. 453114843.
- Simon Hydro-Search, November 11, 1992. *Phase II Work Plan - Environmental Investigation Manufactured Gas Plant Site, Sheboygan, Wisconsin*, Project No. 304533034.

- Natural Resource Technology, Inc., August 31, 1995, *Sediment Sampling Work Plan, Former Manufactured Gas Plant Site, Sheboygan II, Wisconsin*, Project No: 1060.
- Natural Resource Technology, Inc., June 28, 1996. *Phase II Environmental Investigation Report, Former Manufactured Gas Plant Site, North Water Street Sheboygan, Wisconsin*, Project No: 1060.
- Natural Resource Technology, Inc., September 15, 1998. Letter Report, *Site Evaluation of Sheboygan Property (Center Avenue Right-of-Way) Adjacent to the Former Sheboygan MGP Site, Sheboygan, Wisconsin*, Project No: 1313.
- Natural Resource Technology, Inc., November 10, 1998, *Sediment Investigation Report, Former Manufactured Gas Plant Site Sheboygan, Wisconsin*, Project No: 1183.

Details of these environmental investigations are described below. Investigative soil boring, monitoring well, and piezometer locations are shown on Figure 2 and Plate 1.

### **1.3.1 Simon Hydro-Search Phase I Environmental Investigation 1991-1992**

In August 1990, a City of Sheboygan construction crew discovered a "dark oily material" below the ground surface on the Sheboygan II property during construction of a boat docking facility foundation. SHS reported "the excavation location was near the location of the former MGP tar tanks", it is unclear which tar tanks SHS was referencing. SHS reported that personnel from the City of Sheboygan collected a "worst case" soil sample for analyses of various organic and inorganic parameters. Compounds detected included polynuclear aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene and xylene (BETX), total petroleum hydrocarbons (TPH), and total and amenable cyanide. Based on information obtained from the City, other test pit excavations contained "visible contamination" but were not sampled. However, SHS could not reliably determine the locations of these other test pits based on available documentation provided by the City.

SHS conducted a Phase I site investigation in 1992 which included soil sampling from thirteen of fifteen test pits, six surface soil grab samples (collected from zero to three inches bgs), and three grab groundwater samples collected from three of the test pits.

- Surface Soil Sampling: Low levels of total PAHs (less than one ppm) were detected in two surface soil samples. Phenol, BETX, and total, amenable, and weak acid dissociable cyanide compounds were not detected in the surface soil samples.
- Test Pit Sampling: A strong "moth ball-like hydrocarbon odor" was encountered at test pit locations near the former tar tanks (TP-107, TP-108, and TP-109) and at test pit locations within the former relief holder location (TP-113 and TP-114). Slight diesel fuel odors were observed in the northern portion of the site (TP-102, TP-103, TP-104, and TP-106). A few soil samples collected from the test pits were collected below the water table and therefore represent groundwater conditions at their respective locations.
- Groundwater Samples: Groundwater grab samples were collected from three test pits (TP-101, TP-107, and TP-110).

Few surface soil impacts were identified. Only PAHs were detected at very low levels in two locations and may have been due to the long-term use of the site for RV parking. Subsurface soil impacts were identified near the former gas holders and tar tanks. Investigation results indicated the presence of both coal tar and petroleum or fuel oil related impacts. Grab groundwater samples collected at the water table exhibited MGP impacts primarily in one sample (TP-707) downgradient (toward the Sheboygan River) of the former tar tanks. The concentration of benzene detected in the groundwater sample collected from TP-701 (1,700 µg/L) is above the NR 140 ES (5 µg/L). Cyanide was detected in all groundwater samples; however, the fate of any oxide box wastes associated with the facility was not known following the Phase I investigation. The extent and migration of MGP related impacts on the property were not fully assessed by Phase I data.

### **1.3.2 Natural Resource Technology, Inc. Phase II Environmental Investigation**

The NRT 1996 report summarized site data collected from additional site investigation work performed in 1995. Ten soil borings (SB-701 through SB-710) were advanced to characterize

soil type and quality. Seven water table monitoring wells (MW-701 through MW-707), one piezometer (PZ-701), and one staff gauge were constructed/installed to assess groundwater quality and groundwater flow direction.

MGP related soil impacts above the water table are limited in extent and not highly impacted. No unsaturated source area contributing to groundwater impacts was identified. Soils beneath the site include glacial deposits intermixed with fill material in the upper 6 to 14 feet below ground surface (bgs), and predominately fine grained alluvium deposits below. Ash/cinders, bricks, glass, and wood were also found within the fill. Clay and silt dominate the soils to a depth of approximately 30 feet bgs, with discontinuous units of sand, silty sand, and trace gravel. Tar was encountered at or below the water table predominately in the southern and west-central portions of the site at depths ranging from six to 21 feet bgs. No evidence of blue/black wood chips, indicating the presence of potential purifier wastes, was observed on the site. However, a field reconnaissance of the adjacent off-site property to the south of the site revealed surficial blue wood chips as well as blue tinted vegetation, including tree trunks and grass, indicating potential cyanide impacts.

Water level elevation measurements collected in 1995 indicated depth to groundwater ranged from 3.6 to 7.9 feet bgs in the shallow wells and between 13.6 and 16.6 feet bgs in piezometer PZ-701. Groundwater flow was generally to the west-southwest, toward the Sheboygan River. Slight horizontal groundwater gradients were calculated for the site and slight downward vertical hydraulic gradients were calculated for the MW-701/PZ-701 well nest. The calculated minimum and maximum values for average linear groundwater flow velocity in shallow groundwater are approximately 3 to 63 feet per year. The higher velocities are representative of monitoring wells constructed in fill with higher hydraulic conductivity than wells set in shallow native silty and clay material. A sheen was present in wells MW-701, MW-702, MW-704, and MW-707. Tar-like material with a sheen was suspended and noted at well MW-706.

BTEX, PAHs, and cyanide are the constituents of concern in the groundwater and shallow impacts extend from the north central portion of the site to the southern extent of the

investigation area and to the Sheboygan River. Migration of impacted groundwater is likely to the west-southwest, in the general direction of groundwater flow. Areas in which shallow groundwater impact concentrations exceed NR 140 ESs extend over the entire site with the exception of the northernmost portion of the site. Benzene concentrations in the water table wells range from 340 µg/L to 34,000 µg/L, benzo(a)pyrene concentrations range from 0.66 µg/L to 83,000 µg/L, and naphthalene concentrations range from 220 µg/L to 1,900,000 µg/L. The most highly impacted groundwater is located in the center of the site at locations MW-701, MW-702, and MW-706. This is the center of the former MGP operation, near the tar tanks, purifier, the smallest of the three gas holders, and one of the plant buildings. Groundwater quality is less highly impacted to the north and south of this area. The area of cyanide impacts in groundwater extends from approximately the center of the investigation area to the southern extent of the site. RCRA metals (arsenic, barium, cadmium, chromium, lead, selenium, and silver) were not detected in concentrations which exceed NR 140 ESs. The southern and eastern extent of groundwater impacts has not been fully evaluated.

### **1.3.3 Natural Resource Technology, Inc. Sediment Investigation**

The 1998 NRT report documents the initial sediment investigation (presence/absence study) conducted on the Sheboygan River in October 1995 and the subsequent detailed field investigation conducted in November 1995 and June 1996 to evaluate the chemical characteristics of sediments adjacent to the former MGP site. The investigations indicated the presence of BTEX and PAHs in the Sheboygan River sediments adjacent to and downstream of the on-land investigation study area.

Numerous sediment boreholes exhibited tar, sheen, or tar odors. Although tar was found in a number of borehole locations, depth to tar observations suggest that there has been little river scour through certain sections of this segment of the river. Total PAH laboratory analytical results indicate the greatest concentrations occur in shallow sediments located within approximately 60 feet of the shoreline. Based on the depth to tar over much of the area, the constituents of concern do not appear to have migrated vertically; rather, the results suggest that

the constituents of concern may have simply been buried by cleaner sediments deposited since MGP operations have ceased. Laboratory results indicate that BTEX, polychlorinated biphenols (PCBs), metals, cyanide, and phenol are not a concern in the sediments at the site compared with the PAH levels. The investigation results, along with the previous sediment investigations cited herein, indicate that the extent of tar residuals present within Sheboygan River sediments has been determined. Based on these results, NRT recommended an FS for the sediments be prepared.

#### **1.3.4 Natural Resource Technology, Inc., Additional Soil Borings, April 4, 1996**

On April 4, 1996, six additional soil borings (SB-711 through SB-716) were advanced and soil samples were collected for analysis of total organic carbon (TOC), total solids, and TCLP benzene. None of the samples analyzed were identified as characteristic for benzene. These borings were also conducted to further assess the extent of tar on the south portion of the former MGP site. Copies of the soil borings logs, borehole abandonment forms, and laboratory analytical reports are included in Appendix A.

#### **1.3.5 Natural Resource Technology, Inc. Off-Site Investigations, 1998**

The September 15, 1998 NRT letter report documented results of site investigative activities conducted on the vacant City of Sheboygan property located south of the former MGP site (also referenced as the Center Avenue right-of-way) on July 29, 1998.

The investigation program included the completion of six test pits (TP-701 through TP-706), four soil borings (SB-711 through SB-714), one hand auger boring (HA-701), and one surface soil sample (SS-701) (Plate 1). Field activities were conducted on July 29, 1998 to establish the lateral and vertical extent of MGP related soil impacts on the vacant property that could potentially impact development plans by the City of Sheboygan.

In general, the site is overlain with layers of fill material that extend to greater than 13 feet bgs (SB-713) in the eastern upper portion of the right-of-way and to groundwater in the lower portions of the river bank (TP-705). The fill materials encountered across the site are not uniform and consist of silty to gravelly sands, sandy silts, and clay and sand. These fill materials contain varying percentages of glass, brick, porcelain occasional traces of slag and other debris or rubbish.

MGP odors and coal tars were observed in test pits and borings TP-701, TP-705, SB-714, and in the river sediment at HA-701. These test pit and boring locations are in the same areas where surface impacts were previously observed and reflect MGP impacted areas. The vertical extent of these impacts appear to extend to groundwater based on the boring and test pit depths.

The investigation results delineated the vertical and lateral extent of MGP impacted soil above groundwater in the vicinity of the right-of-way. Two shallow zones (less than one foot) and one deeper zone of MGP impacted soil were identified within the right-of-way. In addition, these zones do not appear to extend to the property south of the right-of-way that is targeted for the first phase of condominium construction (Building Nos. 1 and 2). However, impacted sediments were identified beneath the river bank within the right-of-way that were not fully delineated and additional investigation was recommended to identify the southern extent.

## 2 SUBSURFACE CONDITIONS

---

### 2.1 Historical Site Use

MGP operations were conducted at the site through 1929 when the facility was decommissioned. However, based on interviews with personnel familiar with the operations, an aboveground manufactured gas relief holder may have been maintained as a storage facility for manufactured gas through the mid 1940's. The site no longer contains any aboveground MGP related structures; however, there are a number of potential remaining underground structures that could affect the scope and direction of the FS. Former structure locations are provided in Figure 2 and Plate 1. These structures could contain residual amounts of coal tar and include the following:

- Underground Gas Holders: Two holders are located in the northern portion of the site. The conditions of these structures are not known, but it is suspected that the walls and bases of the structures may have been intact and during decommissioning, the interiors of the holders were simply backfilled with fill material. Residual coal tar could be present at the bottom of the holders. During completion of test pit TP- 104 as part of the Phase I investigation, reinforced concrete was encountered at a depth of approximately four feet bgs that may have been the edge of the holder foundation.
- Three Tar Tanks: Two are approximately 30 by 8 feet and one is approximately 20 by 5 feet. One of these tanks may have been encountered during previous dock construction operations by the City of Sheboygan when black coal tar was first noticed. These tanks are located in the central portion of the site.
- Purifier: This structure is approximately 25 feet in diameter and situated near the river in the central portion of the site.

The foundation for a former aboveground relief holder is visible at the south end of the site and consists of a circular concrete pad supported by a shallow foundation footer. In addition, foundations from previous aboveground structures and underground utilities may also remain at the site.



---

## 2.2 Soil

Soil quality data tables from the previous Phase I and II investigations, the off-site soil investigation and MGP impacted distribution maps from the Phase I and II and off-site investigations are provided in Appendix B. Key subsurface conditions that will be addressed as part of the FS include the following:

- **Scattered Oxide Box Wastes:** Scattered oxide box wastes consisting primarily of Prussian-blue (cyanide) stained wood chips and oxide box waste impacted vegetation (tree roots) have been identified in the City of Sheboygan vacant property located south of the former MGP site, within the Center Avenue right-of-way. These impacts are primarily at the ground surface and extend to a depth of approximately one foot bgs.
- **Fill Materials:** These soils are primarily an inconsistent mixture of glacial deposits intermixed with fill material in the upper 6 to 14 feet of soil. Ash/cinders, bricks, concrete, glass, and unstained wood were found within the fill. Based on the previous subsurface investigative data, MGP impacts are limited in extent and there does not appear to be a unsaturated source zone that is providing an on-going contribution to shallow groundwater impacts. Key areas for remedial consideration are located in the central and northern portions of the former MGP site and contain relatively low concentrations of BTEX and PAH compounds.
- **Native Soil:** Clay and silt dominate native soils to the maximum sampling depth of approximately 30 feet bgs, with discontinuous units of sand, silty sand, and trace gravel. Tar was encountered at or below the water table predominately in the southern and west-central portions of the site at depths ranging from six to 21 feet bgs. Groundwater analytical data from piezometer PZ-701 that is screened within the lower silty clay at a depth of approximately 35 feet does not indicate a presence of MGP residuals. The deeper zone will require further evaluation to define vertical extent of tar impacts observed in the southern and west-central portion of the site.

## 2.3 Groundwater

Summaries of groundwater level monitoring and groundwater quality data and a groundwater - contour elevation map from the Phase I and II investigations are included in Appendix B. Key groundwater conditions that will be addressed as part of the FS include the following:

- Shallow Groundwater Flow: Shallow groundwater flow in the upper fill materials across the site is generally towards the Sheboygan river. It is suspected that non-homogenous fill materials that vary in consistency and permeability and subsurface utilities may be influencing local groundwater flow.
- Deep Groundwater Flow: Deep groundwater flow in native sediments has not been fully assessed. Evaluation of the deep aquifer flow geometry (horizontally and vertically) will be needed to assess appropriate remedial options.
- Groundwater Quality: Shallow groundwater is impacted with MGP residuals (BTEX, PAHs and Cyanide) above WDNR enforcement standards (ESs). Off-site migration is primarily to the river and possibly to the south. Initial deeper groundwater quality data from piezometer PZ-701 has indicated the presence of minor MGP residuals consisting of BTEX, PAHs; however, in general, these concentrations have reduced with time.

# 3 DATA COLLECTION OBJECTIVES

---

## 3.1 Soil

### 3.1.1 Remedial Considerations

As described previously, the unsaturated soil MGP impacted areas are limited in extent and there does not appear to be an unsaturated source area which contributes to groundwater impacts. The evidence of tar below the water table could warrant removal if the tar is laterally continuous, and if removal would significantly reduce the effort and cost required for long term groundwater remediation. Determination of the limits and extent of any soil to be excavated will require consideration of the practicality, cost effectiveness and relative environmental benefit associated with excavating impacted materials beneath the water table. Coal tar has been identified to a depth of approximately 21 feet bgs. Given the proximity of the site to the river, significant dewatering could be required to facilitate excavation of the deeper MGP impacted materials. Excavation would also require consideration to the long term site development plans for the area and potential ramifications for direct contact exposure.

Components and remedial options to be evaluated as part of the FS include but are not limited to the following:

- Capping over some or all of the former MGP site and off-site to the south. The nature of the cap and locations to be capped will be evaluated in the FS. Capping will reduce contaminant leaching from the unsaturated zone and provide a direct contact separation.
- Excavation of source areas (i.e., tar and heavily impacted soil) and likely off-site treatment or disposal. The feasibility of on-site treatment will be evaluated; however, it is likely that the size of the site would be prohibitive for staging treatment equipment. Possible disposal/treatment strategies to be evaluated include off-site thermal treatment, off-site cement kiln and off-site landfill disposal.

- Installation of engineering controls near the proposed condominium complexes for MGP impacted sediments previously identified beneath the river bank within the Center Avenue right-of-way to mitigate direct contact exposure to condominium residents.

### 3.1.2 Objectives

Several data collection objectives for further assessing soil impacts and evaluating remedial alternatives for the site have been identified and include:

- Evaluating the extent of tar impacts, both horizontally and vertically, in several locations at the site including near MW-706, MW-704, SB-701, in the vicinity of the southern relief holder, and off-site, south of TP-705;
- Evaluating the presence of MGP impacts inside the northern former gas holders;
- Evaluating the extent of any MGP impacts south of the Center Avenue right-of-way, in the vicinity of the proposed Building No. 2;
- Evaluating key geotechnical design parameters for the possible construction of a hydraulic barrier wall (see Section 3.2);
- Collecting soil treatability data for use in assessing soil treatment technologies; and,
- Collecting additional data near the proposed condominium complexes to aid in determining the need, type and design of engineering controls.

## 3.2 Groundwater

### 3.2.1 Remedial Considerations

The previous investigation results indicate that groundwater to depths greater than 20 feet bgs are impacted above WDNR ESs. Complete removal of coal tar impacted source areas may not be a realistic objective and shallow groundwater treatment and/or control may be warranted on a long term basis. Given the complexities of the subsurface stratigraphy and the presence of stringers of coal tar at depths greater than 14 to 16 feet bgs, the most viable remedial strategy for the site will most likely require a combination of remedial technologies. Remedial options to be evaluated as part of the FS include but are not limited to the following:

- Targeted source removal.
- Installation of a hydraulic barrier wall to further reduce migration of phase separated and dissolved MGP residuals to the river and minimize groundwater extraction by eliminating hydraulic communication of shallow groundwater with the river. Along with the location (shoreline versus inland) and design (length, depth, and alignment), several options for the barrier wall will be evaluated in the FS that will include conventional sheet piling and flexible membrane certain wells.
- Active treatment technologies that will include interceptor trenches and/or groundwater recovery wells for groundwater extraction and aboveground treatment.
- In-situ active treatment technologies such as the application of hydrogen peroxide.
- In-situ passive treatment technologies such as the construction of a reactive barrier wall using activated carbon for treatment or other applicable treatment medium.

### 3.2.2 Objectives

Several data collection objectives for further assessing groundwater impacts and evaluating remedial alternatives for the site have been identified and include:

- Further defining the vertical extent of groundwater contamination in the southern down-gradient direction of the site;
- Establishing an up-gradient monitoring point, north of MW-706;
- Defining the horizontal extent of groundwater contamination in the northeast direction and possibly the southern direction;
- Collecting data for use in evaluating groundwater treatment technologies; and,
- Evaluating groundwater containment/control alternatives (i.e., extraction wells versus trenches) by assessing groundwater contaminant distributions, hydraulic conductivities, soil types and stratigraphy, and site groundwater elevations.

# 4 TECHNICAL SCOPE

---

## 4.1 Technical Approach and Schedule

The data collection field activities will be performed during Fall/Winter 1998 to collect sufficient and appropriate data for preparation of the FS in the Winter 1999. Preparation of the draft FS report will be completed in the Spring of 1999 for submittal to the WDNR for review. The field activities will be conducted as follows:

- Task 1, Planning, Coordination and Site Preparation: The proposed site activities will be coordinated and planned with the City of Sheboygan and WPSC.
- Task 2, Soil Boring and Monitoring Well Installation: The locations of the borings and wells were determined on the basis of the previous investigation results. The detailed scope of the additional borings and monitoring wells is discussed below.
- Task 3, Groundwater Monitoring and Sampling: Groundwater monitoring and sampling will be conducted on the new and existing wells to update the current data base for evaluation of remedial options.
- Task 4, FS Preparation: The results of the soil and groundwater evaluations and geotechnical testing will be used to identify a comprehensive remedial strategy for the site.

Performance of the site activities will be conducted in accordance with NRT's standard practices manual. A copy of the table of contents for this manual is provided in Appendix C. Copies of the appropriate standard practices manual will be kept on-site thorough completion of the field activities.

## 4.2 Planning, Coordination and Site Preparation

Planning and coordination and site preparation will include the following:

- An underground utility locate will be requested to further delineate underground utilities in the vicinity of Campmarina and the properties located directly south. Underground utility locates will also be reviewed with respect to the construction

and/or abandonment of any underground utilities associated with the condominium development.

- Construction plans for the new condominium buildings will be reviewed to assess foundation locations and depths which could affect the proposed soil boring locations.
- Drilling activities will be coordinated with representatives of the City of Sheboygan. Storage and staging areas for materials, drums and roll-off box will be reviewed with and approved by City personnel prior to initiating the field activities.

## 4.3 Soil Borings

### 4.3.1 Additional Investigation

Nine additional soil borings will be advanced to further define the extent of MGP coal tar and oils identified at several locations on the former MGP property and off-site to the south in the Center Avenue right-of-way. These borings will also aid in determining potential excavation areas for the FS. The locations where coal tar was previously identified include MW-704, MW-706, SB-701, several borings in the area of the southern former relief holder, and off-site to the south at TP-705. The proposed locations of the borings are shown on Figure 3. Specific activities that will be conducted as part of the additional investigation include the following:

- Three soil borings (SB-732, SB-734 and SB-735) will be extended to a maximum depth of approximately 25 feet bgs. These borings will be used to further define the lateral and vertical extent of coal tar impacts previously identified and obtain data for treatability assessment. Discrete soil samples will be obtained from the identified impacted zones and submitted for laboratory analysis.
- Two borings (SB-731 and SB-733) will be advanced in the two northern gas holders to investigate potential MGP soil and groundwater impacts remaining inside the holders. These borings will extend to a maximum depth of approximately 20 feet bgs or to the bottom of each holder.
- Two shallow (five to seven feet bgs) Geoprobe borings ( SB-725 and SB-726) will be advanced to groundwater to further evaluate the potential for MGP impacted river sediments beneath the river bank.
- Up to two soil borings (SB-723 and SB-724) will be advanced to approximately 20 feet bgs within the foundation foot print for Building No. 2. Boring SB-724 will be advanced initially. If there is no indication of any MGP impacts based on

visual, olfactory and photoionization determinations at SB-724, then SB-723 will not be completed.

- Discrete and/or composite soil samples will be collected from each of the borings and analyzed for the parameters indicated in Table 1. Discrete soil samples will be analyzed for BTEX (U.S. EPA 8020), PAHs (U.S. EPA 8270), total lead (U.S. EPA 6010) and total cyanide (U.S. EPA 9010). Composite sample collection and preparation will be conducted on the basis of the compositing strategy outlined in Section 4.3.3.
- Subsurface conditions will be continuously logged to document soil lithology, groundwater conditions, MGP related impacts and any other subsurface features. Soil borings will be completed using either 3 ¼ or 4 ¼ inch hollow stem augers.
- Drill cuttings will be transported to a roll-off box to be located on-site. Borings will be abandoned using either bentonite chips or a cement-bentonite slurry. Cement-bentonite slurry will be used for borings beneath the foundation foot print and within the gravel roadway at Campmarina. Bentonite chips will be acceptable for borings in landscaped areas or non-traffic areas

#### 4.3.2 Geotechnical Borings and Testing

Geotechnical borings are proposed to be advanced along the river bank to establish geotechnical design parameters for the installation of a hydraulic barrier wall. A total of four soil borings (GB-727 through GB-730) will be advanced along the river bank as indicated in Figure 3. Geotechnical borings will be performed along the river bank to determine potential key depths for the wall. Based on the soils encountered during drilling of PZ-701, a sand layer exists at 23-27 ft bgs followed by approximately 8 ft of clay. The borings will be performed to assess the continuity and depth of the sand layer and the permeability of the potential clay tie-in unit beneath. In general, borings will be advanced through the unconsolidated strata to approximately 35 feet bgs (a minimum of five feet into the native clay below the sand layer noted at PZ-701).

Specific field activities that will be conducted to complete the geotechnical borings include the following:

- The field engineer will document classification of soils. The driller will perform standard penetration tests, in accordance with ASTM standard D1586 using a split-spoon sampling device. Soil will be classified by ASTM standards D2487 and D2488 at two foot intervals from surface grade to 28 feet BGS.



- During advancement of each bore hole, one to two thin-walled sampling tubes will be pushed by the driller in accordance with ASTM D1587 at intervals deemed appropriate by the field engineer for geotechnical evaluation of the upper fill and clay materials and the low-permeability clay strata. If the fill or clay is too hard for shelly tubes, then brass or plastic core liners inserted inside the split spoon sampler will be driven to obtain relatively undisturbed samples. Split spoon samples will also be collected and archived for possible further geotechnical testing. If cohesionless granular conditions are encountered in the upper fill materials, thin walled tube sampling will not be conducted and samples from the split spoon will be used for testing.
- Borings will be initially advanced using six or eight inch mud rotary through the fill and into native materials approximately 20 feet bgs. Temporary casing will then be installed to prevent cross-contamination before completing the remainder of the boring to approximately 35 feet bgs.
- Augers will be decontaminated between borings. Drill cuttings will be transported to a roll off box. Drilling mud will be drummed. Borings will be abandoned by grouting the holes with a bentonite chips to ground surface.

Geotechnical laboratory tests will be conducted on both the upper fill and the low permeability native clay strata. These tests will be conducted to evaluate index, permeability and strength properties. The proposed number of tests to be conducted and laboratory test methods are summarized in Table 1. Selection of samples for testing will be conducted following completion of the drilling program and evaluation of the field data. A brief description of each of the tests is provided below:

- Permeability: Soil samples from all four of the boreholes will be evaluated for permeability by ASTM standard D2434 or equivalent to determine the coefficient of permeability. Testing would be conducted using the back pressure triaxial method under fully saturated conditions. Permeability tests will be performed primarily on the potential key-in unit (silty clay) for the purpose of evaluating vertical migration control.
- Index properties: Approximately, 4 to 6 samples from the fill material and the native clay will be submitted for geotechnical testing to determine the moisture/density. Approximately, 4 to 6 samples will be submitted for grain size distribution analysis, using ASTM methods D2937, D422, D2216 and D4959. Approximately 4 to 6 samples will be submitted to determine the Atterberg Limits in accordance with ASTM method D4318.

- Unconsolidated Undrained (UU) Triaxial Testing: Four undisturbed samples from potential key-in units will be submitted for UU testing to assess compressive strength characteristics and cohesion.

#### 4.3.3 Soil Treatability

To assess both on-site and off-site treatability capabilities for the MGP impacted soils at the property, the following activities will be conducted:

- Two composite soil samples from the borings and well installations (SB-734, SB-735, PZ-702 and PZ-703) will be collected from representative contaminated soils for laboratory analysis of BETX (U.S. EPA 8020), PAHs (U.S. EPA 8270), cyanide (U.S. EPA 9010), lead (U.S. EPA 6010), and sulfur (ASTM 0129) as indicated in Table 1. One composite sample will be collected from the upper unsaturated fill material and one will be collected from the lower saturated coal tar impacted zone. Both composite samples will be analyzed for toxicity characteristic leachate procedure (TCLP) benzene and the composite from the lower material will also be analyzed for total sulfur. This information will be used for determining average concentrations of excavated soils and will be given to potential thermal treatment contractors for representative feedstock concentrations. Additional soil samples may also be collected from the split spoon sampling activities and archived pending review by the field engineer for submittal to the laboratory. Determination of which samples to be submitted will be conducted on the basis of the subsurface conditions encountered and field estimated contaminant distribution.
- One composite soil sample will be collected from representative impacted soils in the roll-off box and submitted for laboratory analysis of Waste Management's Protocol B parameters for disposal as a non-hazardous special waste.
- One composite sample (minimum three five gallon containers) will be collected for submittal for off-site cement kiln treatability evaluation and possibly thermal desorption tray testing.

#### 4.4 Monitoring Well and Piezometer Installation

Locations of the proposed monitoring wells and piezometers are shown on Figure 3. Monitoring well MW-708 is proposed as an up-gradient monitoring well, located northeast of MW-706 along North Water Street. Monitoring well MW-709 is proposed as a side-gradient monitoring well,

located north-west of MW-703. Construction of the wells will consist of two inch diameter schedule 40 PVC and 10 foot of screen set to intersect the shallow groundwater table. Piezometers PZ-702 and PZ-703 will be located adjacent to MW-706 and MW-707, respectively. The piezometers will aid in defining the vertical extent of groundwater contamination and establishing vertical gradients. Data collected at PZ-703 will also be used to support the geotechnical evaluation. Piezometers will likely be screened from 30 to 35 ft bgs and permanently cased to 20 feet bgs to prevent cross contamination with MGP impacted materials. Wells will be completed flush with the ground surface and secured with lockable steel traffic load rated well covers. Each well will be developed utilizing dedicated bailers and/or pumps to remove fine-grained particles and establish an effective filter pack around the well.

## 4.5 Groundwater Monitoring and Sampling

Following installation of the monitoring wells and piezometers, a complete round of groundwater monitoring, sampling and analysis will be conducted on both the existing and new wells and piezometers (12 total). The groundwater monitoring and laboratory analytical data will be used to update the groundwater elevation data and contaminant distribution. These data will be used for developing concentration and trend data and evaluating groundwater containment in the Feasibility Study. Groundwater samples will be analyzed for BTEX (U.S. EPA 8020), PAHs (U.S. EPA 8310) and total, amenable (U.S. EPA 335.1), and dissociable cyanide (M-4500 CNI) as indicated in Table 1.

## **6.0 QUALITY ASSURANCE**

---

### **6.1 Investigation Procedures**

Natural Resource Technology, Inc. (NRT) has developed numerous technical Standard Practices to provide documentation of the use of widely recognized protocols and standards in the performance of field operations. The list of Standard Practices and source documents are provided in Appendix C. Copies of the relevant standard portions will be kept on-site throughout the duration of field activities.

### **6.2 Equipment Decontamination**

Equipment decontamination is addressed in NRT Standard Practice 07-04-05. The drilling subcontractor will provide a steam cleaner and a decontamination area will be established on the site for decontamination of the drill rig, augers, and drill stem used for the borings. No oils, greases, or other petroleum based products will be used on any downhole equipment. Sampling equipment (including split spoon samplers, sampling spatulas, etc.) will be cleaned by washing in Alconox detergent followed by triple rinses with distilled water prior to the collection of each sample. If necessary, an isopropyl alcohol rinse will be performed to remove tar or PAH residues. Decontamination wash and alcohol rinsate will be containerized in drums for future treatment and/or disposal.

### **6.3 Cross-Contamination**

Procedures for collecting soil and groundwater samples which minimize the potential for cross-contamination are described in NRT Standard Practice Sections 07-07 and 07-08, respectively. Sampling personnel will wear new sampling gloves between collection of each sample and utilize new bailer draw lines at each well. Care will be exercised to prevent the bailer, draw line,

and sampling containers from contact with possible contamination sources. New PVC bailers will be dedicated to each well to prevent cross-contamination between wells.

## **6.4 Laboratory Quality Assurance**

### **6.4.1 Laboratory Analysis**

Analysis of environmental media samples will be performed by a certified laboratory. Analytical parameters for the different media are listed on Table 1.

### **6.4.2 Quality Control Samples**

Quality Control (QC) samples include trip blanks and sample duplicates to evaluate the possible introduction of contamination during the sampling process and to verify reproducibility of results. One trip blank will accompany BTEX sample vials submitted to the laboratory for every shipment of groundwater samples collected for each sampling event. This blank will be prepared and supplied by the laboratory along with the appropriate pre-cleaned sampling containers. The trip blank will be transported to the field and laboratory along with the groundwater samples and will be analyzed for BTEX.

Duplicate samples will be obtained for each 10 or fewer water media samples collected. Duplicate sample identification will be noted in field log books so that the laboratory cannot determine the source of the duplicate. Duplicate samples will be identified with 890 through 899 series identifiers.

Since dedicated bailers and sampling equipment will be used for collection of groundwater samples, field blanks to evaluate equipment decontamination are not necessary. Duplicate samples and trip blanks may not be required for sampling related to discharges to the sanitary sewer.

## 6.5 Waste Management Plan

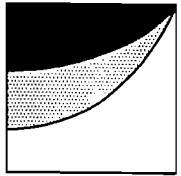
The waste management plan will follow NRT Standard Practice 06-07 for the handling and minimization of wastes. Investigative waste will be containerized in a roll-off box and/or drums until disposal arrangements are made. Solid wastes will be disposed at an off-site facility based on the composite soil sample results. Liquid wastes will be disposed through the City of Sheboygan Wastewater Treatment Plant (WWTP) after providing the WWTP with a copy of the groundwater analytical results and receiving WWTP approval.

## 6.6 Health and Safety Plan

NRT will develop a Health and Safety Plan for personnel working at the site during all field activities. This plan will be a separate document and will be available upon request if review of the document is required. Personnel will read and be familiar with the plan prior to the commencement of field work. NRT will provide subcontractors with a copy of the project Health and Safety Plan and will conduct a briefing on-site prior to commencement of work.

Prior to any subsurface investigative activities, public and private utilities will be located. Diggers Hotline, WPSC, and the City of Sheboygan will be notified to clear the proposed drilling locations. If necessary, boring locations will be relocated as appropriate to avoid encountering utilities.

**FIGURES**



# Natural Resource Technology

PROJECT NO. 1313  
 DRAWING NO. 1313-A01  
 FIGURE NO. 1

SITE LOCATION MAP  
 CAMPMARINA, FORMER COAL GAS FACILITY  
 WISCONSIN PUBLIC SERVICE CORPORATION (WPSOC)  
 SHEBOYGAN, WISCONSIN

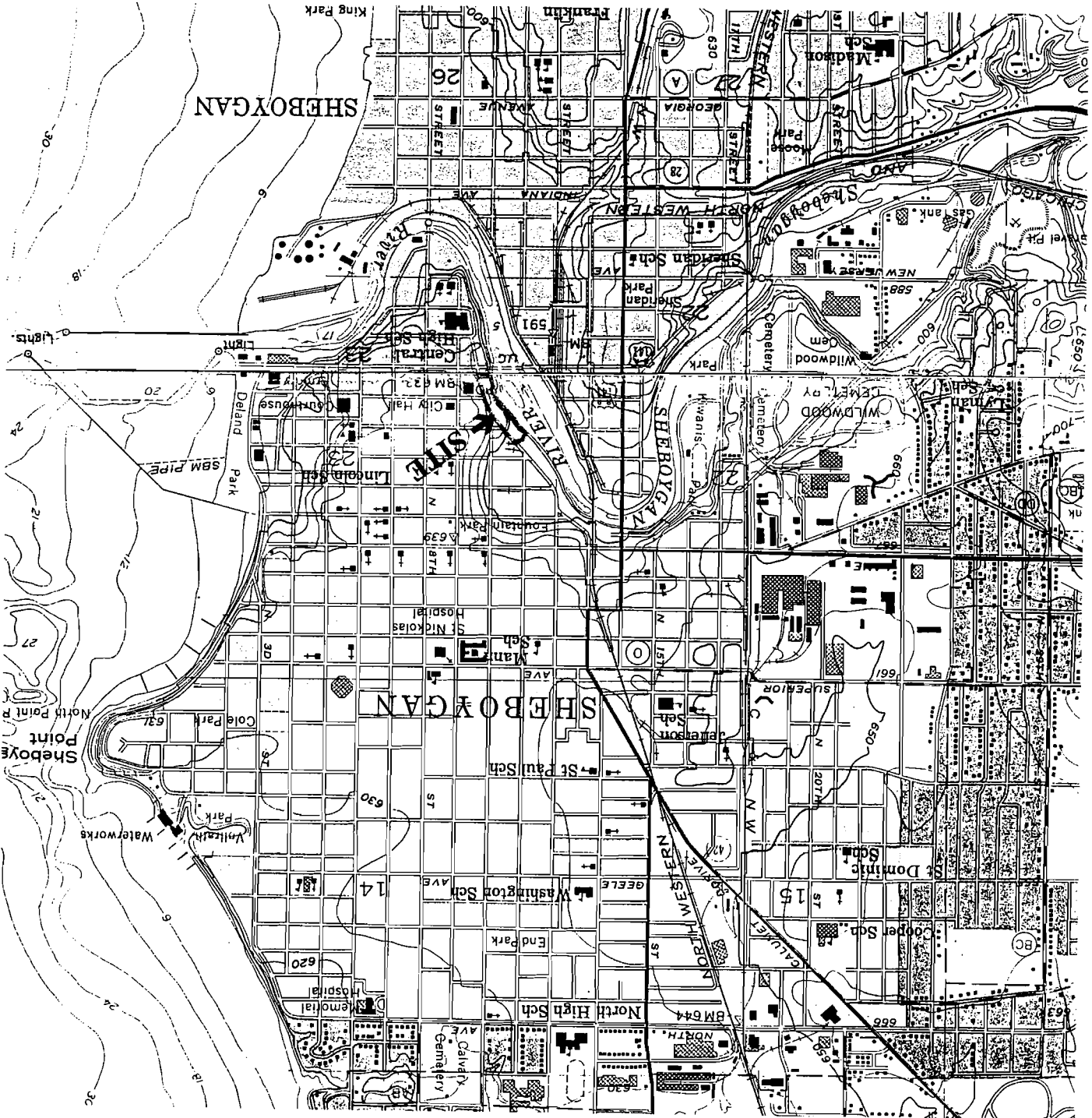
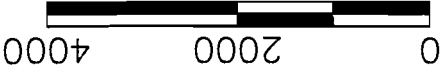
DATE: \_\_\_\_\_ APPROVED BY: \_\_\_\_\_ DRAWN BY: T.A.S.

SOURCE: USGS 7.5 MINUTE QUADRANGLE,  
 SHEBOYGAN NORTH, DATED 1954,  
 PHOTOREVISED 1973.

QUADRANGLE LOCATION



SCALE IN FEET  
 CONTOUR INTERVAL 10 FEET

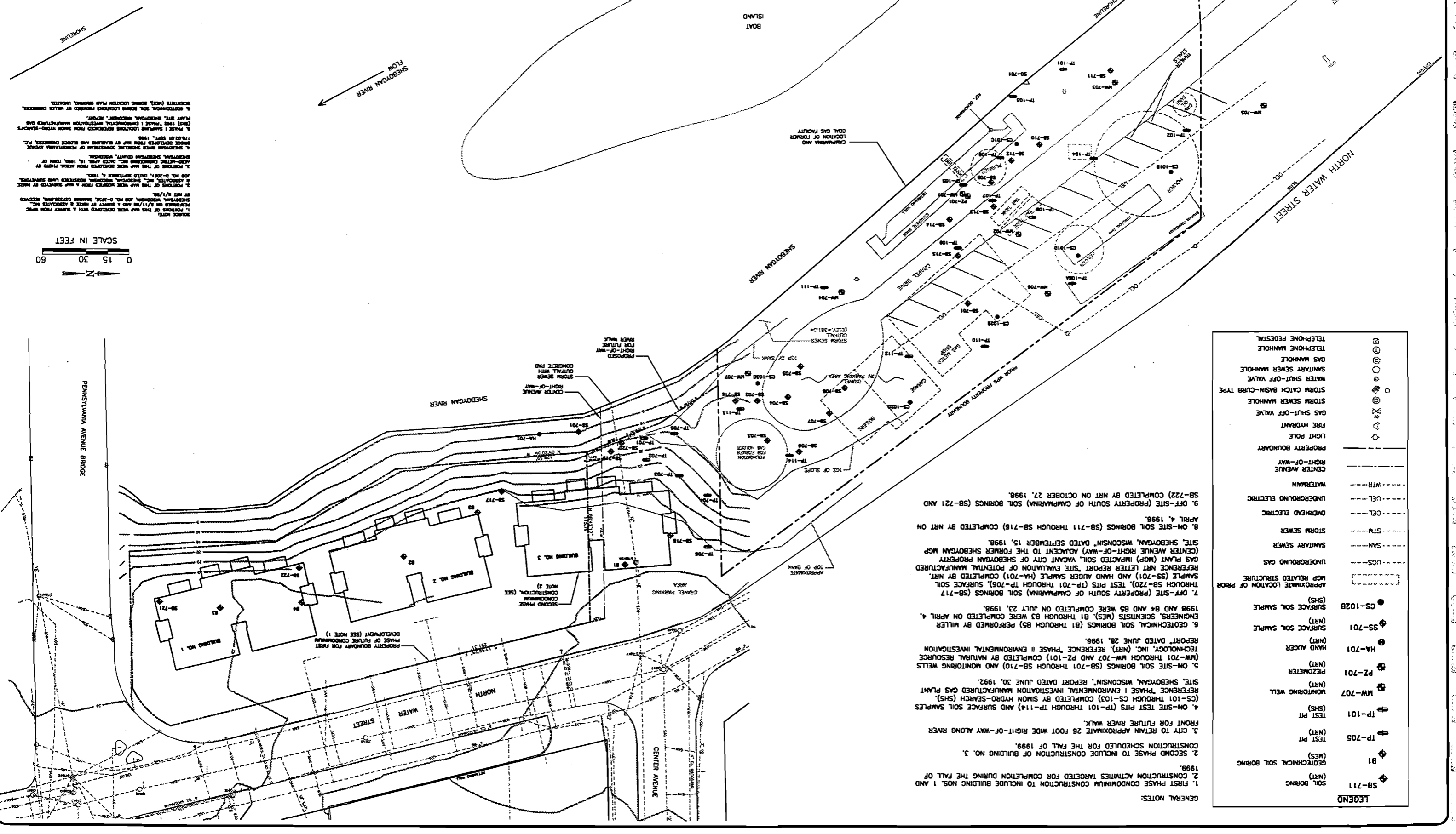
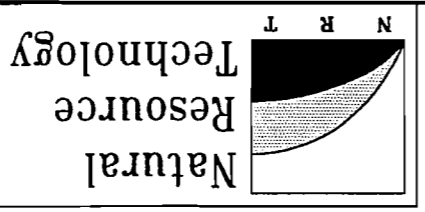




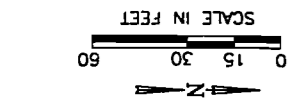
PROJECT NO. 1313/2.1  
 DRAWING NO. 1313-B02  
 FIGURE NO. 2

DATE: 12/03/98  
 DRAWN BY: TJS  
 CHECKED BY: JRT  
 APPROVED BY: [Signature]  
 DATE: 12/3/98

FEASIBILITY STUDY WORK PLAN  
 CAMPMARINA FORMER COAL GAS FACILITY  
 WISCONSIN PUBLIC SERVICE CORPORATION (WPS)  
 SHEBOYGAN, WISCONSIN



SOURCE NOTES:  
 1. PORTIONS OF THIS MAP WERE DEVELOPED WITH A SURVEY FROM 1998 PERFORMED BY NRT AND ASSOCIATES INC. (NRT) AND ASSOCIATES INC. (NRT). SHEBOYGAN, WISCONSIN, JOB NO. D-2723, DRAWING NUMBER, RECEIVED BY NRT 8/1/98.  
 2. PORTIONS OF THIS MAP WERE DEVELOPED FROM AERIAL PHOTOGRAPHS OF THE MAP AREA DATED APRIL 18, 1993, TAKEN BY THE SHEBOYGAN, WISCONSIN COUNTY ENGINEER, SHEBOYGAN, WISCONSIN.  
 3. PORTIONS OF THIS MAP WERE DEVELOPED FROM AERIAL PHOTOGRAPHS OF THE MAP AREA DATED APRIL 18, 1993, TAKEN BY THE SHEBOYGAN, WISCONSIN COUNTY ENGINEER, SHEBOYGAN, WISCONSIN.  
 4. SHEBOYGAN WATER SERVICE CORPORATION (WSSC) HAS PROVIDED AERIAL PHOTOGRAPHS OF THE MAP AREA DATED APRIL 18, 1993, TAKEN BY THE SHEBOYGAN, WISCONSIN COUNTY ENGINEER, SHEBOYGAN, WISCONSIN.  
 5. WPS I SURVEY LOCATIONS MONITORED FROM SIMON HYDRO-SEARCH (SHS) 1997.  
 6. WPS I SURVEY LOCATIONS MONITORED FROM SIMON HYDRO-SEARCH (SHS) 1997.  
 7. WPS I SURVEY LOCATIONS MONITORED FROM SIMON HYDRO-SEARCH (SHS) 1997.  
 8. WPS I SURVEY LOCATIONS MONITORED FROM SIMON HYDRO-SEARCH (SHS) 1997.  
 9. WPS I SURVEY LOCATIONS MONITORED FROM SIMON HYDRO-SEARCH (SHS) 1997.



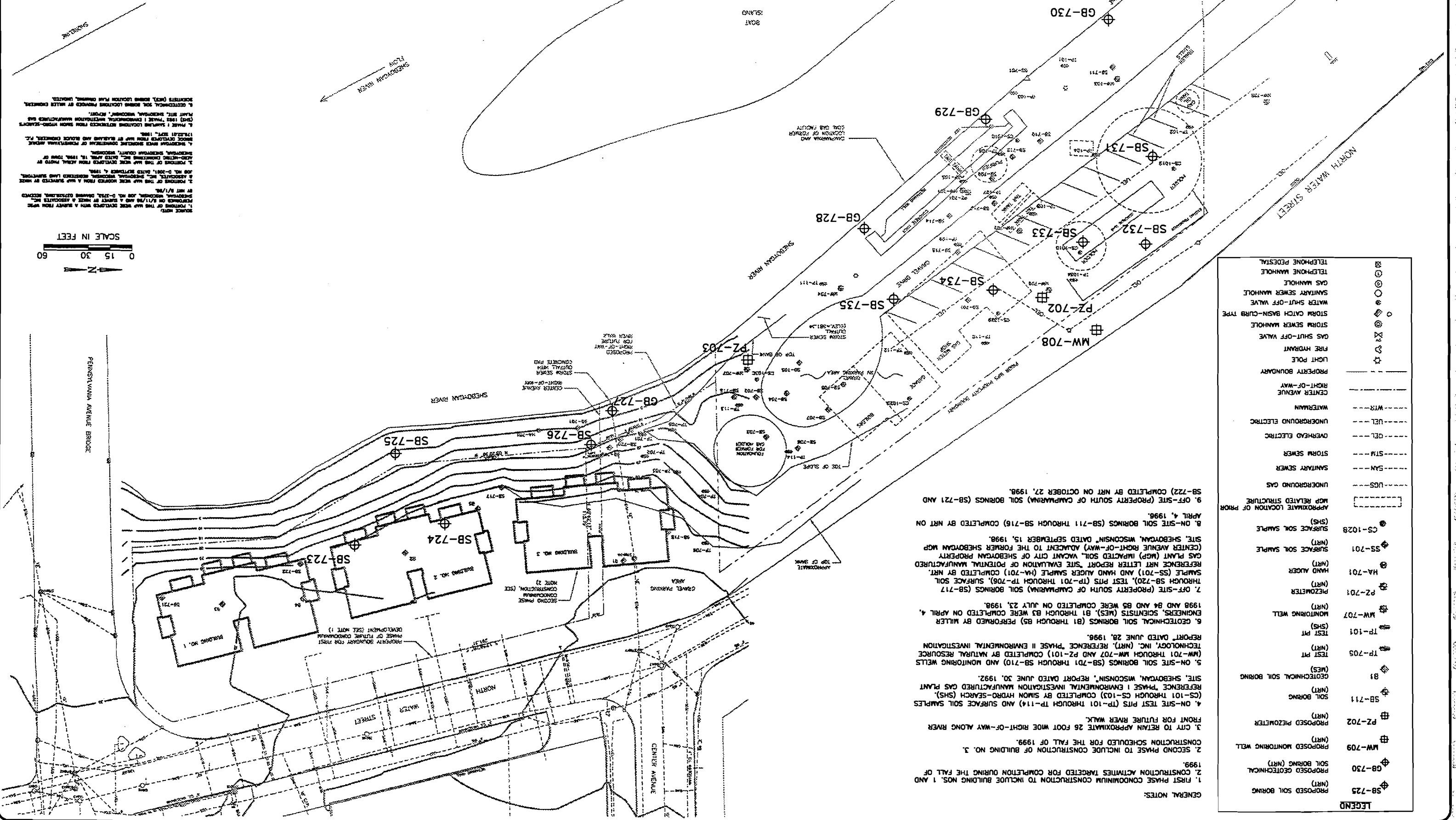
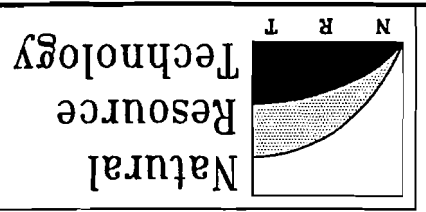
GENERAL NOTES:  
 1. FIRST PHASE CONDOMINIUM CONSTRUCTION TARGETED FOR COMPLETION DURING THE FALL OF 1999.  
 2. SECOND PHASE TO INCLUDE CONSTRUCTION OF BUILDING NO. 3.  
 3. CITY TO RETAIN APPROXIMATE 26 FOOT WIDE RIGHT-OF-WAY ALONG RIVER FRONT FOR FUTURE RIVER WALK.  
 4. ON-SITE TEST PTS (TP-101 THROUGH TP-114) AND SURFACE SOIL SAMPLES (CS-101 THROUGH CS-103) COMPLETED BY SIMON HYDRO-SEARCH (SHS).  
 5. ON-SITE SOIL BORINGS (SB-701 THROUGH SB-710) AND MONITORING WELLS (MW-701 THROUGH MW-707) COMPLETED BY NATURAL RESOURCE TECHNOLOGY, INC. (NRT). REFERENCE "PHASE II ENVIRONMENTAL INVESTIGATION REPORT" DATED JUNE 28, 1998.  
 6. GEOTECHNICAL SOIL BORINGS (B1 THROUGH B5) PERFORMED BY MILLER ENGINEERS, SCIENTISTS (MES). B1 THROUGH B3 WERE COMPLETED ON APRIL 4, 1998 AND B4 AND B5 WERE COMPLETED ON JULY 23, 1998.  
 7. OFF-SITE (PROPERTY SOUTH OF CAMPMARINA) SOIL BORINGS (SB-717 THROUGH SB-720), TEST PTS (TP-701 THROUGH TP-706), SURFACE SOIL SAMPLE (SS-701) AND HAND AUGER SAMPLE (HA-701) COMPLETED BY NRT. REFERENCE NRT LETTER REPORT "SITE EVALUATION OF POTENTIAL MANUFACTURED GAS PLANT (MGP) IMPACTED SOIL" ADVANCED TO THE FORMER SHEBOYGAN WCP (CENTER AVENUE RIGHT-OF-WAY) TO THE FORMER SHEBOYGAN MGP SITE, SHEBOYGAN, WISCONSIN, DATED SEPTEMBER 15, 1998.  
 8. ON-SITE SOIL BORINGS (SB-711 THROUGH SB-716) COMPLETED BY NRT ON APRIL 4, 1998.  
 9. OFF-SITE (PROPERTY SOUTH OF CAMPMARINA) SOIL BORINGS (SB-721 AND SB-722) COMPLETED BY NRT ON OCTOBER 27, 1998.

LEGEND	
SB-711	SOIL BORING (NRT)
B1	GEOTECHNICAL SOIL BORING (MES)
TP-705	TEST PT (NRT)
TP-101	TEST PT (SHS)
MW-707	MONITORING WELL (NRT)
PZ-701	PIEZOMETER (NRT)
HA-701	HAND AUGER (NRT)
SS-701	SURFACE SOIL SAMPLE (NRT)
CS-1028	SURFACE SOIL SAMPLE (SHS)
---	APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE
---	UNDERGROUND GAS
---	SANITARY SEWER
---	STORM SEWER
---	OVERHEAD ELECTRIC
---	UNDERGROUND ELECTRIC
---	WATERMAIN
---	CENTER AVENUE RIGHT-OF-WAY
---	PROPERTY BOUNDARY
---	LIGHT POLE
---	FIRE HYDRANT
---	GAS SHUT-OFF VALVE
---	STORM SEWER MANHOLE
---	STORM CATCH BASIN-CURB TYPE
---	WATER SHUT-OFF VALVE
---	SAWTRAY SEWER MANHOLE
---	GAS MANHOLE
---	TELEPHONE MANHOLE
---	TELEPHONE PEDESTAL

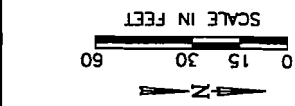
PROJECT NO. 1313/2.1  
 DRAWING NO. 1313-803  
 FIGURE NO. 3

**INVESTIGATION PLAN**  
 CAMPARINA FORMER COAL GAS FACILITY  
 WISCONSIN PUBLIC SERVICE CORPORATION (WPS)  
 SHEBOYGAN, WISCONSIN

DRAWN BY: TJS  
 CHECKED BY: JRC  
 DATE: 12/05/98  
 APPROVED BY: JRC  
 DATE: 12/13/98



1. PORTION OF THIS MAP WAS DEVELOPED WITH A SURVEY FROM WPS...  
 2. PORTION OF THIS MAP WAS DEVELOPED FROM A SURVEY BY...  
 3. PORTION OF THIS MAP WAS DEVELOPED FROM AERIAL PHOTO...  
 4. SHEBOYGAN RIVER...  
 5. SHEBOYGAN RIVER...  
 6. SHEBOYGAN RIVER...  
 7. SHEBOYGAN RIVER...  
 8. SHEBOYGAN RIVER...  
 9. SHEBOYGAN RIVER...  
 10. SHEBOYGAN RIVER...



**GENERAL NOTES:**

- FIRST PHASE CONSTRUCTION TARGETED FOR COMPLETION DURING THE FALL OF 1999.
- SECOND PHASE TO INCLUDE CONSTRUCTION OF BUILDING NO. 3. CONSTRUCTION SCHEDULED FOR THE FALL OF 1999.
- CITY TO RETAIN APPROXIMATE 26 FOOT WIDE RIGHT-OF-WAY ALONG RIVER FRONT FOR FUTURE RIVER WALK.
- ON-SITE TEST PITS (TP-101 THROUGH TP-114) AND SURFACE SOIL SAMPLES (CS-101 THROUGH CS-103) COMPLETED BY SIMON HYDRO-SEARCH (SHS). REFERENCE "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE, SHEBOYGAN, WISCONSIN", REPORT DATED JUNE 30, 1992.
- ON-SITE SOIL BORINGS (SB-701 THROUGH SB-710) AND MONITORING WELLS (MW-701 THROUGH MW-707) COMPLETED BY NATURAL RESOURCE TECHNOLOGY, INC. (NRT). REFERENCE "PHASE II ENVIRONMENTAL INVESTIGATION REPORT" DATED JUNE 28, 1998.
- GEOTECHNICAL SOIL BORINGS (B1 THROUGH B5) PERFORMED BY MILLER ENGINEERS, SCIENTISTS (MES), B1 THROUGH B3 WERE COMPLETED ON APRIL 4, 1998 AND B4 AND B5 WERE COMPLETED ON JULY 23, 1998.
- OFF-SITE (PROPERTY SOUTH OF CAMPARINA) SOIL BORINGS (SB-717 THROUGH SB-720), TEST PITS (TP-701 THROUGH TP-706), SURFACE SOIL SAMPLE (SS-701) AND HAND AUGER SAMPLE (HA-701) COMPLETED BY NRT. REFERENCE NRT LETTER REPORT "SITE EVALUATION OF POTENTIAL MANUFACTURED GAS PLANT (MGP) IMPACTED SOIL, VACANT CITY OF SHEBOYGAN PROPERTY (CENTER AVENUE RIGHT-OF-WAY) ADJACENT TO THE FORMER SHEBOYGAN MGP SITE, SHEBOYGAN, WISCONSIN" DATED SEPTEMBER 15, 1998.
- ON-SITE SOIL BORINGS (SB-711 THROUGH SB-716) COMPLETED BY NRT ON APRIL 4, 1998.
- OFF-SITE (PROPERTY SOUTH OF CAMPARINA) SOIL BORINGS (SB-721 AND SB-722) COMPLETED BY NRT ON OCTOBER 27, 1998.

**LEGEND**

PROPOSED SOIL BORING (NRT)	SB-725
PROPOSED GEOTECHNICAL SOIL BORING (NRT)	GB-730
PROPOSED MONITORING WELL (NRT)	MW-709
PROPOSED PEZOMETER (NRT)	PZ-702
SOIL BORING (NRT)	SB-711
GEOTECHNICAL SOIL BORING (MES)	B1
TEST PIT (NRT)	TP-705
TEST PIT (SHS)	TP-101
MONITORING WELL (NRT)	MW-707
PEZOMETER (NRT)	PZ-701
HAND AUGER (NRT)	HA-701
SURFACE SOIL SAMPLE (NRT)	SS-701
SURFACE SOIL SAMPLE (SHS)	CS-1028
APPROXIMATE LOCATION OF MGP RELATED STRUCTURE	
UNDERGROUND GAS	UGS
SANITARY SEWER	SAN
STORM SEWER	STA
OVERHEAD ELECTRIC	OEL
UNDERGROUND ELECTRIC	UEL
WATERMAIN	WTR
CENTER AVENUE RIGHT-OF-WAY	
PROPERTY BOUNDARY	
LIGHT POLE	
FIRE HYDRANT	
GAS SHUT-OFF VALVE	
GAS MANHOLE	
STORM SEWER MANHOLE	
STORM CATCH BASIN-CURB TYPE	
WATER SHUT-OFF VALVE	
SANITARY SEWER MANHOLE	
TELEPHONE MANHOLE	
TELEPHONE PEDESTAL	

**TABLES**

**Table 1 - Soil and Groundwater Sampling Locations and Parameters**  
**Feasibility Study Work Plan**  
**Campmarina, Former Coal Gas Facility**  
**Wisconsin Public Service Corporation (WPS)**  
**Sheboygan, Wisconsin**

SAMPLING LOCATION	NO. & TYPE of SAMPLES FROM EA. LOCATION	PARAMETERS
<b>SOIL</b>		
<i>Additional Investigation</i>		
SB-723 off-site to south	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
SB-724 off-site to south	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
SB-725 off-site to south	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
SB-726 off-site to south	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
SB-731 n. gas holder	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
SB-732 up-gradient	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
SB-733 n. gas holder	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
<i>Geotechnical</i>		
SB-727 along river	1 D fill/cl, 1 D lower clay	F.H. Permeability, Triaxial Tests (lower clay only); moisture, bulk density, grain size, Atterburg Lim. (both)
SB-728 along river	1 D fill/cl, 1 D lower clay	F.H. Permeability, Triaxial Tests (lower clay only); moisture, bulk density, grain size, Atterburg Lim. (both)
SB-729 along river	1 D fill/cl, 1 D lower clay	F.H. Permeability, Triaxial Tests (lower clay only); moisture, bulk density, grain size, Atterburg Lim. (both)
SB-730 along river	1 D fill/cl, 1 D lower clay	F.H. Permeability, Triaxial Tests (lower clay only); moisture, bulk density, grain size, Atterburg Lim. (both)
PZ-703 along river	TBD	TBD
<i>Soil Treatability</i>		
SB-734 betw. MW-706/ SB-701	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
SB-735 betw. SB-701/ MW-704	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide, Total Sulfur
PZ-702 adj. to MW-706	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide, Total Sulfur
PZ-703 adj. to MW-707	1 D most contam.	BETX, PAHs, Total Lead, Total Cyanide
Composite 1 (above borings)	1 C upper fill	BETX, PAHs, Total Lead, Total Cyanide, TCLP Benzene
Composite 2 (above borings)	1 C lower fill/clay	BETX, PAHs, Total Lead, Total Cyanide, TCLP Benzene, Total Sulfur
<i>Waste Characterization</i>		
Roll-off Box	1 C	Protocol B
<b>GROUNDWATER</b>		
All Existing and New Wells	12 wells & 1 dup, D	BETX, PAHs, Total Cyanide, Amenable Cyanide, Diss. Cyanide
Drum (for disp. at Sheb. WWTP)	1 C	-BETX, Oil and Grease, Total Sus. Solids, Total Cyanide
Groundwater Treatability	1 mon. well & 1 piez., D	Hardness, Total and Diss. Iron, Lead
<b>Notes:</b>		
D = Discrete Sample		
C = Composite Sample		
TBD = To Be Determined in Field		
F.H. = Falling Head		

**APPENDIX A**

**APRIL 4, 1996 SOIL BORING LOGS, BOREHOLE  
ABANDONMENT FORMS AND LABORATORY ANALYTICAL  
DATA**

<b>Facility/Project Name</b> WPSC - Sheboygan Water Street Feasibility Invest.			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-711
<b>Boring Drilled By</b> (Firm name and name of crew chief) Boart Longyear (Environmental Drilling Division) Kevin From / Jeff Flaminio			<b>Date Drilling Started</b> 04/04/96	<b>Date Drilling Completed</b> 04/04/93	<b>Drilling Method</b> Hydraulic Probe
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b>	<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> Feet MSL	<b>Borehole Diameter</b> 2.5 inches inches
<b>Boring Location</b> State Plane		<b>Feet N</b> <b>Feet E</b>	<b>Lat</b> <b>Long</b>	<b>Local Grid Location (if applicable)</b> <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	

<b>County</b> Sheboygan	<b>DNR County Code</b>	<b>Civil Town/City/ or Village</b> Sheboygan
----------------------------	------------------------	---

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
SB711 (0.5)	2			0'-1' FILL - SILTY GRAVEL											
SB711 (2)	13		2	1'-7' FILL - GRAVEL/SILT/CLAY no odor.											
SB711 (4)	10		4	with BRICKS and white sand, soft, wet, ODOR	FILL										
SB711 (6)	12		6	no white sand, trace organics											
SB711 (8)	16		8	7'-9' CLAY, light olive gray (5Y 6/2), trace organics, 5% fine sand, soft, very moist, no odor.	CL										
SB711 (10)	22		10	9'-11' SILTY SAND WITH CLAY, olive gray (5Y 5/2), poorly graded, fine to medium, trace fine gravel, subround, soft, wet, no odor.	SM										
			12	E.O.B @ 11											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *[Handwritten Signature]* Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	Wpsc Site #2
Well/Drillhole/Borehole Location	County	Original Well Owner (If Known)	
SB-711	Sheboygan	WISCONSIN PUBLIC SERVICE CORPORATION	
NW 1/4 of SW 1/4 of Sec. 23 : T. 15 N: R. 23		Present Well Owner	
(If Applicable)		Wpsc	
Grid Location	Gov't Lot	Street or Route	
		P.O. Box 1980	
Grid Location	Grid Number	City, State, Zip Code	
		Sheboygan, WI	
Civil Town Name	Facility Well No. and/or Name (If Applicable)		WI Unique Well No.
SHEBOYGAN	SB-711		
Street Address of Well	Reason For Abandonment		
732 NORTH WATER STREET	Test Boring		
City, Village	Date of Abandonment		
Sheboygan	04/04/96		

WELL/DRILLHOLE/BOREHOLE INFORMATION			
(3) Original Well/Drillhole/Borehole Construction Completed On (Date)		(4) Depth to Water (Feet)	
24/04/96		~9'	
<input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input checked="" type="checkbox"/> Drillhole <input type="checkbox"/> Borehole		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If No, Explain <u>N/A</u>	
Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____		(5) Required Method of Placing Sealing Material	
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock		<input checked="" type="checkbox"/> Conductor Pipe - Gravity <input type="checkbox"/> Conductor Pipe - Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____	
Total Well Depth (ft) _____ Casing Diameter (ins.) _____ (From ground surface)		(6) Sealing Materials	
Casing Depth (Ft.) _____		<input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Chipped Bentonite	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet		For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Bentonite Pellets <input checked="" type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite-Cement Grout	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Granular Bentonite	Surface	11.0	.5 Bag	

(8) Comments \_\_\_\_\_

(9) Name of Person or Firm Doing Sealing Work	
Boart Longyear	
Signature of Person Doing Work	Date Signed
<i>[Signature]</i>	4-9-96
Street or Route	Telephone Number
101 Alderson Street	(715) 359-7090
City, State, Zip Code	
Schofield, WI 54476	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>Facility/Project Name</b> WPSC - Sheboygan Water Street Feasibility Invest.			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-712	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Boart Longyear (Environmental Drilling Division) Kevin From / Jeff Flaminio			<b>Date Drilling Started</b> 04/04/96		<b>Date Drilling Completed</b> 04/04/93	
<b>DNR Facility Well No.</b>			<b>WI Unique Well No.</b>		<b>Common Well Name</b>	
<b>Final Static Water Level</b> Feet MSL			<b>Surface Elevation</b> Feet MSL		<b>Borehole Diameter</b> 2.5 inches inches	
<b>Boring Location</b> State Plane			<b>Feet N</b>  <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Sheboygan			<b>DNR County Code</b>		<b>Civil Town/City/ or Village</b> Sheboygan	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
SB712 (0.5)	4		0	0'-1' FILL - SILTY GRAVEL											
SB712 (2)	15		2	1'-6' FILL - CINDERS/SILTY GRAVEL, compact, moist, SLIGHT ODOR.	FILL										
SB712 (4)	6		4	very moist											
SB712 (6)	0		6												
SB712 (8)	6		8	6'-11" SANDY CLAY, olive gray (5Y 4/2), fine sand, trace fine gravel, soft, wet, no odor.	CL										
SB712 (10)	24		10	trace organics, 10% gravel											
			12	E.O.B @ 11											
			14												
			16												
			18												
			20												
			22												

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *[Handwritten Signature]* Firm: **Natural Resource Technology**

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.



All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b> WPSO Site #2	
Well/Drillhole/Borehole Location <b>SB-712</b>	County <b>Sheboygan</b>	Original Well Owner (If Known) <b>WISCONSIN PUBLIC SERVICE CORPORATION</b>	
NW 1/4 of SW 1/4 of Sec. <b>23</b> : T. <b>15</b> N: R. <b>23</b> <input checked="" type="checkbox"/> E <input type="checkbox"/> W (If Applicable)		Present Well Owner <b>WPSO</b>	
Grid Location Gov't Lot _____ Grid Number _____		Street or Route <b>P.O. Box 1980</b>	
ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <b>Sheboygan, WI</b>	
Civil Town Name <b>SHEBOYGAN</b>		Facility Well No. and/or Name (If Applicable) <b>SB-712</b>	WI Unique Well No.
Street Address of Well <b>732 NORTH WATER STREET</b>		Reason For Abandonment <b>Test Boring</b>	
City, Village <b>Sheboygan</b>		Date of Abandonment <b>04/04/96</b>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>		<b>(4) Depth to Water (Feet)</b> <u>5.0</u>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>04/04/96</u>  <input type="checkbox"/> Monitoring Well <input type="checkbox"/> Construction Report Available? <input type="checkbox"/> Water Well <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Drillhole <input type="checkbox"/> Borehole  Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____  Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock  Total Well Depth (ft) _____ Casing Diameter (ins.) _____ (From ground surface)  Casing Depth (Ft.) _____  Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If No, Explain <u>N/A</u>	
		Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
		<b>(5) Required Method of Placing Sealing Material</b> <input checked="" type="checkbox"/> Conductor Pipe - Gravity <input type="checkbox"/> Conductor Pipe - Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain)	
		<b>(6) Sealing Materials</b> For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Clay-Sand Slurry <input checked="" type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Bentonite-Cement Grout <input type="checkbox"/> Chipped Bentonite	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Granular Bentonite	Surface	11.0	.5 Bag	

(8) Comments \_\_\_\_\_

**(9) Name of Person or Firm Doing Sealing Work**  
**Boart Longyear**  
 Signature of Person Doing Work: \_\_\_\_\_ Date Signed: 4-9-96  
 Street or Route: **101 Alderson Street** Telephone Number: **(715) 359-7090**  
 City, State, Zip Code: **Schofield, WI 54476**

**(10) FOR DNR OR COUNTY USE ONLY**

Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

Facility/Project Name: *WPC - Sheboygan Water Street Feasibility Invest.*

Boring Drilled By: (Firm name and name of crew chief) *Boat Longyear (Environmental Drilling Division)*  
 Kevin From / Jeff Flaminio

Date Drilling Started: *04/04/96*  
 Date Drilling Completed: *04/04/93*  
 Drilling Method: *Hydraulic Probe*

DNR Facility Well No.: *MI Unique Well No.*  
 Common Well Name: *Feet N*  
 Final Static Water Level: *Feet MSL*  
 Surface Elevation: *Feet MSL*  
 Borehole Diameter: *2.5 inches*

Boring Location: *State Plane*  
 Feet N:  Lat:  Long:

County: *Sheboygan*  
 DNR County Code: *Sheboygan*  
 Civil Town/City/ or Village: *Sheboygan*

License/Permit/Monitoring Number: *SB-713*  
 Boring Number: *SB-713*

Soil/Rock Description And Geologic Origin For Each Major Unit

USCS

Graphic Log

Well Diagram

PID/FID

Compressive Strength

Moisture Content

Liquid Limit

Plasticity Index

P 200

RDD/ Comments

Sample	Number and Type	Length All. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	RDD/ Comments
SB713 (0.5)	3			0-1'	FILL - SILTY GRAVEL										
SB713 (2)	15			1-7'	FILL - CINDERS/SILTY GRAVEL, compact, slightly moist.										
SB713 (4)	12				CINDERS only										
SB713 (6)	18				CINDERS with silt, black and dark greenish gray (10Y 4/1), trace fine sand, very moist, ODOR.										
SB713 (8)	22				7-9' SANDY CLAY, dark gray (5Y 4/1), medium soft, wet, ODOR.	CL									
SB713 (10)	17				8-11' SILTY SAND WITH CLAY, gray (5Y 5/1), poorly graded, fine to coarse, predominantly medium, trace fine gravel, trace gastropod shells, soft, wet, SLIGHT ODOR.	SM									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *[Signature]*  
 Firm: *Natural Resource Technology*

This form is authorized by Chapters 144.14 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b> WPSB Site #2	
Well/Drillhole/Borehole Location <u>SB-713</u>	County <u>Sheboygan</u>	Original Well Owner (If Known) <u>WISCONSIN PUBLIC SERVICE CORPORATION</u>	
NW <u>1/4</u> of SW <u>1/4</u> of Sec. <u>23</u> : T. <u>15</u> N: R. <u>23</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W		Present Well Owner <u>WPSB</u>	
(If Applicable) Gov't Lot _____ Grid Number _____		Street or Route <u>P.O. Box 1980</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Sheboygan, WI</u>	
Civil Town Name <u>SHEBOYGAN</u>		Facility Well No. and/or Name (If Applicable) <u>SB-713</u>	WI Unique Well No.
Street Address of Well <u>732 NORTH WATER STREET</u>		Reason For Abandonment <u>Test Boring</u>	
City, Village <u>Sheboygan</u>		Date of Abandonment <u>04/04/96</u>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>		<b>(4) Depth to Water (Feet)</b> <u>7.0</u>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>04/04/96</u>		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
<input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input checked="" type="checkbox"/> Drillhole <input type="checkbox"/> Borehole		Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug		Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock		If No, Explain <u>N/A</u>	
Total Well Depth (ft) _____ Casing Diameter (ins.) _____		Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
(From ground surface)		Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Casing Depth (Ft.) _____		Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
If Yes, To What Depth? _____ Feet		<b>(5) Required Method of Placing Sealing Material.</b>	
		<input checked="" type="checkbox"/> Conductor Pipe - Gravity <input type="checkbox"/> Conductor Pipe - Pumped	
		<input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain)	
		<b>(6) Sealing Materials</b> For monitoring wells and monitoring well boreholes only	
		<input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Bentonite Pellets	
		<input type="checkbox"/> Sand-Cement (Concrete) Grout <input checked="" type="checkbox"/> Granular Bentonite	
		<input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite-Cement Grout	
		<input type="checkbox"/> Clay-Sand Slurry	
		<input type="checkbox"/> Bentonite-Sand Slurry	
		<input type="checkbox"/> Chipped Bentonite	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Granular Bentonite	Surface	11.0	.5 Bag	

(8) Comments \_\_\_\_\_

**(9) Name of Person or Firm Doing Sealing Work**  
Boart Longyear

Signature of Person Doing Work <u>[Signature]</u>	Date Signed <u>4-9-96</u>
Street or Route <u>101 Alderson Street</u>	Telephone Number <u>(715) 359-7090</u>
City, State, Zip Code <u>Schofield, WI 54476</u>	

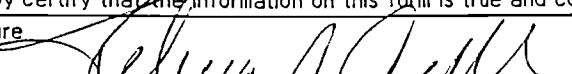
(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

<b>Facility/Project Name</b> WPSC - Sheboygan Water Street Feasibility Invest.			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-714
<b>Boring Drilled By</b> (Firm name and name of crew chief) Boart Longyear (Environmental Drilling Division) Kevin From / Jeff Flaminio			<b>Date Drilling Started</b> 04/04/96	<b>Date Drilling Completed</b> 04/04/93	<b>Drilling Method</b> Hydraulic Probe
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b>	<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> Feet MSL	<b>Borehole Diameter</b> 2.5 inches
<b>Boring Location</b> State Plane		<b>Feet N</b>  <b>Feet E</b>	<b>Lat</b>  <b>Long</b>	<b>Local Grid Location (if applicable)</b> <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	

<b>County</b> Sheboygan	<b>DNR County Code</b>	<b>Civil Town/City/ or Village</b> Sheboygan
----------------------------	------------------------	---

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties						RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
SB714 (2)	6		2	0'-1' FILL - SILTY GRAVEL, light yellowish brown (2.5Y 6/3), coarse, subangular, compact, slightly moist, no odor.											
SB714 (4)	18		4	1'-7' FILL - CINDERS/CLAY/SAND, loose, slightly moist, no odor. predominantly clay	FILL										
SB714 (8)	3		6	CINDERS and silty sand, moist, no odor											
SB714 (8)	14		8	7'-11' SILTY SAND WITH CLAY, olive gray (5Y 4/2), medium to coarse, subround, 5-10% fine subround gravel, soft, very moist, no odor.	SM										
SB714 (10)	20		10												
	17		12	E.O.B @ 11											
			14												
			16												
			18												
			20												
			22												

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature 	Firm <b>Natural Resource Technology</b>
---	---

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b> WPSC Site #2	
Well/Drillhole/Borehole Location <u>SB-714</u>	County <u>Sheboygan</u>	Original Well Owner (If Known) <u>WISCONSIN PUBLIC SERVICE CORPORATION</u>	
NW 1/4 of SW 1/4 of Sec. <u>23</u> ; T. <u>15</u> N. R. <u>23</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W		Present Well Owner <u>WPSC</u>	
(If Applicable) Gov't Lot _____ Grid Number _____		Street or Route <u>P.O. Box 1980</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Sheboygan, WI</u>	
Civil Town Name <u>SHEBOYGAN</u>		Facility Well No. and/or Name (If Applicable)   WI Unique Well No. <u>SB-714</u>   _____	
Street Address of Well <u>732 NORTH WATER STREET</u>		Reason For Abandonment <u>Test Boring</u>	
City, Village <u>Sheboygan</u>		Date of Abandonment <u>04/04/96</u>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>		<b>(4) Depth to Water (Feet)</b> <u>7.0</u>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>04/04/98</u>  <input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input checked="" type="checkbox"/> Drillhole <input type="checkbox"/> Borehole  Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____  Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock  Total Well Depth (ft) _____ Casing Diameter (ins.) _____ (From ground surface)  Casing Depth (Ft.) _____  Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If No, Explain <u>N/A</u>	
		Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
		<b>(5) Required Method of Placing Sealing Material</b> <input checked="" type="checkbox"/> Conductor Pipe - Gravity <input type="checkbox"/> Conductor Pipe - Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____	
		<b>(6) Sealing Materials</b> For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Sand-Cement (Concrete) Grout <input checked="" type="checkbox"/> Granular Bentonite <input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite-Cement Grout <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Chipped Bentonite	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Granular Bentonite	Surface	11.0	.5 Bag	

<b>(8) Comments</b> _____		<b>(9) Name of Person or Firm Doing Sealing Work</b>	
Boart Longvear		<b>(10) FOR DNR OR COUNTY USE ONLY</b> Date Received/Inspected: _____ District/County: _____ Reviewer/Inspector: _____ Follow-up Necessary: _____	
Signature of Person Doing Work <u>[Signature]</u>	Date Signed <u>4-9-96</u>		
Street or Route <u>101 Alderson Street</u>	Telephone Number <u>(715) 359-7090</u>		
City, State, Zip Code <u>Schofield, WI 54476</u>			

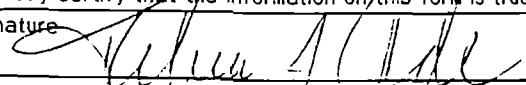
- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>Facility/Project Name</b> WPSC-Sheboygan Water Street Feasibility Invest.			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-715
<b>Boring Drilled By</b> (Firm name and name of crew chief) Boart Longyear (Environmental Drilling Division) Kevin Frome/ Jeff Flaminio			<b>Date Drilling Started</b> 04/04/96	<b>Date Drilling Completed</b> 04/04/96	<b>Drilling Method</b> Hydraulic Probe
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b>	<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> Feet MSL	<b>Borehole Diameter</b> 2.5 inches
<b>Boring Location</b> State Plane		<b>Feet N</b>  <b>Feet E</b>	<b>Lat</b> Long	<b>Local Grid Location (If applicable)</b> <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	

<b>County</b> Sheboygan	<b>DNR County Code</b>	<b>Civil Town/City/ or Village</b> Sheboygan
----------------------------	------------------------	---

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
SB715 (5)	3		0	0'-1' FILL-SILTY GRAVEL											
SB715 (2)	12		2	1'-9' FILL CINDERS/GRAVEL/SAND/SILT, loose, slightly moist, no odor.											
SB715 (4)	14		4	CINDERS, loose, dry.											
SB715 (6)	11		6	with BRICKS, wet	FILL										
SB715 (8)	3		8	SHEEN, ODOR.											
SB715 (10)	13		10	9'-11' CLAYEY SAND, olive (5Y 4/3), poorly graded, predominately medium to coarse, subround, trace fine subround gravel, soft, wet, no odor.	SC										
			12	EOB @ 11'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature:  Firm: **Natural Resource Technology**

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b> WPSC Site #2	
Well/Drillhole/Borehole Location <u>SB-715</u>	County <u>Shebovgan</u>	Original Well Owner (If Known) <u>WISCONSIN PUBLIC SERVICE CORPORATION</u>	
NW <u>1/4</u> of SW <u>1/4</u> of Sec. <u>23</u> : T. <u>15</u> N. R. <u>23</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W (If Applicable)		Present Well Owner <u>WPSC</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>P.O. Box 1980</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Shebovgan, WI</u>	
Civil Town Name <u>SHEBOVGAN</u>		Facility Well No. and/or Name (If Applicable) <u>SB-715</u>	WI Unique Well No.
Street Address of Well <u>732 NORTH WATER STREET</u>		Reason For Abandonment <u>Test Boring</u>	
City, Village <u>Shebovgan</u>		Date of Abandonment <u>04/04/96</u>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>		<b>(4) Depth to Water (Feet)</b> <u>5.0</u>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>04/04/96</u>		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
<input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input checked="" type="checkbox"/> Drillhole <input type="checkbox"/> Borehole		Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____		Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock		If No, Explain <u>N/A</u>	
Total Well Depth (ft) _____ Casing Diameter (ins.) _____ (From ground surface)		Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Casing Depth (Ft.) _____		Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet		Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
		If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
		<b>(5) Required Method of Placing Sealing Material</b>	
		<input checked="" type="checkbox"/> Conductor Pipe - Gravity <input type="checkbox"/> Conductor Pipe - Pumped	
		<input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain)	
		<b>(6) Sealing Materials</b>	
		For monitoring wells and monitoring well boreholes only	
		<input type="checkbox"/> Neat Cement Grout	
		<input type="checkbox"/> Sand-Cement (Concrete) Grout	
		<input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite Pellets	
		<input type="checkbox"/> Clay-Sand Slurry <input checked="" type="checkbox"/> Granular Bentonite	
		<input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Bentonite-Cement Grout	
		<input type="checkbox"/> Chipped Bentonite	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Granular Bentonite	Surface	11.0	.5 Bag	

<b>(8) Comments</b>		<b>(10) FOR DNR OR COUNTY USE ONLY</b>	
<b>(9) Name of Person or Firm Doing Sealing Work</b> <u>Boart Longyear</u>		Date Received/Inspected	District/County
Signature of Person Doing Work <u>[Signature]</u>	Date Signed <u>4-9-96</u>		
Street or Route <u>101 Alderson Street</u>	Telephone Number <u>(715) 359-7090</u>	Reviewer/Inspector	
City, State, Zip Code <u>Schofield, WI 54476</u>		Follow-up Necessary	

<b>Facility/Project Name</b> WPSC-Sheboygan Water Street Feasibility Invest.		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-716	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Boart Longyear (Environmental Drilling Division) Kevin Frome/ Jeff Flaminio		<b>Date Drilling Started</b> 04/04/96		<b>Date Drilling Completed</b> 04/04/96	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Common Well Name</b>	
<b>Final Static Water Level</b> Feet MSL		<b>Surface Elevation</b> Feet MSL		<b>Borehole Diameter</b> 2.5 inches	
<b>Boring Location</b> State Plane		<b>Feet N</b>  <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	

<b>County</b> Sheboygan	<b>DNR County Code</b>	<b>Civil Town/City/ or Village</b> Sheboygan
----------------------------	------------------------	---

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RGD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
SB716 (5)	7		0	0'-1' FILL-SILTY GRAVEL										
SB716 (2)	18		2	1'-9' FILL-CLAY/GRAVEL/SILT, compact, slightly moist, no odor.										
SB716 (4)	23		4	WOOD/SANDY CLAY, dark gray (5Y 4/1), soft, wet, ODOR.  no wood, BRICKS. SHEEN.	FILL	[Graphic Log Pattern]	[Well Diagram Pattern]							
SB716 (6)	14		6											
SB716 (8)	6		8											
SB716 (10)	9		10	9'-11' SILTY SAND, olive (5Y 4/3), poorly graded, predominately coarse, 5% fine to medium subround gravel, trace clay, soft, wet, ODOR.	SM	[Graphic Log Pattern]	[Well Diagram Pattern]							
			12	EOB @ 11'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature <i>[Signature]</i>	Firm Natural Resource Technology
---------------------------------	-------------------------------------

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.



All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b> WPSC Site #2	
Well/Drillhole/Borehole Location <u>SB-716</u> County <u>Shebovgan</u>		Original Well Owner (If Known) <u>WISCONSIN PUBLIC SERVICE CORPORATION</u>	
NW 1/4 of SW 1/4 of Sec. <u>23</u> : T. <u>15</u> N: R. <u>23</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W		Present Well Owner <u>WPSC</u>	
(If Applicable) Gov't Lot _____ Grid Number _____		Street or Route <u>P.O. Box 1980</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Shebovgan, WI</u>	
Civil Town Name <u>SHEBOVGAN</u>		Facility Well No. and/or Name (If Applicable)   WI Unique Well No. <u>SB-716</u>   _____	
Street Address of Well <u>732 NORTH WATER STREET</u>		Reason For Abandonment <u>Test Boring</u>	
City, Village <u>Shebovgan</u>		Date of Abandonment <u>04/04/96</u>	

<b>WELL/DRILLHOLE BOREHOLE INFORMATION</b>			
(3) Original Well/Drillhole/Borehole Construction Completed On (Date) <u>04/04/96</u>		(4) Depth to Water (Feet) <u>~9'</u>	
<input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input checked="" type="checkbox"/> Drillhole <input type="checkbox"/> Borehole		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If No, Explain <u>N/A</u>	
Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Dia Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____		(5) Required Method of Placing Sealing Material <input checked="" type="checkbox"/> Conductor Pipe - Gravity <input type="checkbox"/> Conductor Pipe - Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____	
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock		(6) Sealing Materials <span style="float:right">For monitoring wells and monitoring well boreholes only</span>	
Total Well Depth (ft) _____ Casing Diameter (ins.) _____ (From ground surface)		<input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Clay-Sand Slurry <input checked="" type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Bentonite-Cement Grout <input type="checkbox"/> Chipped Bentonite	
Casing Depth (Ft.) _____ Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet			

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Granular Bentonite	Surface	11.0	.5 Bag	

(8) Comments \_\_\_\_\_

(9) Name of Person or Firm Doing Sealing Work  
Boart Longyear  
 Signature of Person Doing Work [Signature] Date Signed 4-9-96  
 Street or Route 101 Alderson Street Telephone Number (715) 359-7090  
 City, State, Zip Code Schofield, WI 54476

FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected _____	District/County _____
Reviewer/Inspector _____	
Follow-up Necessary _____	



NATIONAL ENVIRONMENTAL TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

NDNR NO. 128053530

## ANALYTICAL AND QUALITY CONTROL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996

Job No: 96.02915

Enclosed are the Analytical and Quality Control reports for the following samples submitted for analysis:

Sample Number	Sample Description	Date Taken	Date Received
178811	SB-711 (2) (S)	04/04/1996	04/08/1996
178812	SB-712 (8) (S)	04/04/1996	04/08/1996
178813	SB-713 (8) (S)	04/04/1996	04/08/1996
178814	SB-714 (2) (S)	04/04/1996	04/08/1996
178815	SB-714 (8) (S)	04/04/1996	04/08/1996
178816	SB-715 (2) (S)	04/04/1996	04/08/1996
178817	SB-715 (10) (S)	04/04/1996	04/08/1996
178818	SB-716 (2) (S)	04/04/1996	04/08/1996

**MASTER FILE COPY**  
PROJECT # 1150 - Sheb II  
CO: \_\_\_\_\_

The above sample(s) may have a result flag shown on the report. The following are the result flag definitions:

A = Analyzed/extracted past hold time	B = Blank is contaminated
C = Standard outside of control limits	D = Diluted for analysis
F = Sample filtered in lab	G = Received past hold time
H = Late eluting hydrocarbons present	I = Improperly handled sample
J = Estimated concentration	L = Common lab solvent and contaminant
M = Matrix interference	P = Improperly preserved sample
Q = Result confirmed via re-analysis	S = Sediment present
T = Does not match typical pattern	W = BOD re-set due to missed dilution
X = Unidentified compound(s) present	Z = Internal standard outside limits

Brian D. DeJong, Organic Operations Manager  
Certification No. 128053530



NATIONAL  
ENVIRONMENTAL  
TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WDR No. 120053530

## ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996  
Job No: 96.02915  
Sample No: 178811  
Account No: 52450  
Page 2

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-711 (2) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/08/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	67.0	%	n/a	S-5030	04/26/1996	1434
OC	15,500	mg/kg	1,000	E-415.1	04/18/1996	75
CLP ZHE VOLATILE PREP	Complete			S-1311	04/11/1996	123
TCLP-VOLATILES-8240						
CLP-Benzene	<0.020	mg/L	0.020	S-8240	04/16/1996	224
Surr: Toluene-d8	90.4	%	n/a	S-8240	04/16/1996	224
Surr: Bromofluorobenzene	89.6	%	n/a	S-8240	04/16/1996	224
Surr: 1,2-Dichloroethane-d4	98.4	%	n/a	S-8240	04/16/1996	224



NATIONAL  
ENVIRONMENTAL  
TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WDNR NO. 128855533

## ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996  
Job No: 96.02915  
Sample No: 178812  
Account No: 52450  
Page 3

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-712 (8) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/08/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	62.8	%	n/a	S-5030	04/26/1996	1434
POC	25,100	mg/kg	1,000	E-415.1	04/18/1996	75



NATIONAL ENVIRONMENTAL TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WBNR NO. 120053530

### ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996  
Job No: 96.02915  
Sample No: 178813  
Account No: 52450  
Page 4

JOB DESCRIPTION: #1150-5.1 WPC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-713 (8) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/08/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	80.7	%	n/a	S-5030	04/26/1996	1434
DOC	62,000	mg/kg	1,000	E-415.1	04/18/1996	75



NATIONAL ENVIRONMENTAL TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WDRR No. 128033330

**ANALYTICAL REPORT**

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996  
Job No: 96.02915  
Sample No: 178814  
Account No: 52450  
Page 5

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-714 (2) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/08/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	85.7	%	n/a	S-5030	04/26/1996	1434
DOC	13,900	mg/kg	1,000	E-415.1	04/18/1996	75
TCLP ZHE VOLATILE PREP	Complete			S-1311	04/11/1996	123
TCLP-VOLATILES-8240						
TCLP-Benzene	0.04	mg/L	0.020	S-8240	04/12/1996	222
Surr: Toluene-d8	91.8	%	n/a	S-8240	04/12/1996	222
Surr: Bromofluorobenzene	90.0	%	n/a	S-8240	04/12/1996	222
Surr: 1,2-Dichloroethane-d4	100.0	%	n/a	S-8240	04/12/1996	222



NATIONAL ENVIRONMENTAL TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WDNR NO. 123053530

### ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996  
Job No: 96.02915  
Sample No: 178815  
Account No: 52450  
Page 6

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-714 (8)(S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/08/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	85.2	%	n/a	S-5030	04/26/1996	1434
OC	5,940	mg/kg	1,000	E-415.1	04/18/1996	75



**NATIONAL ENVIRONMENTAL TESTING, INC.**

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WDNR NO. 128053530

## ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996  
Job No: 96.02915  
Sample No: 178816  
Account No: 52450  
Page 7

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-715 (2) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/08/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	84.5	%	n/a	S-5030	04/26/1996	1434
VOC	15,100	mg/kg	1,000	E-415.1	04/18/1996	75
UCLP ZHE VOLATILE PREP	Complete			S-1311	04/11/1996	123
TCLP-VOLATILES-8240						
UCLP-Benzene	<0.020	mg/L	0.020	S-8240	04/12/1996	222
Surr: Toluene-d8	90.6	%	n/a	S-8240	04/12/1996	222
Surr: Bromofluorobenzene	87.0	%	n/a	S-8240	04/12/1996	222
Surr: 1,2-Dichloroethane-d4	98.6	%	n/a	S-8240	04/12/1996	222





NATIONAL  
ENVIRONMENTAL  
TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WENR NO. 128855530

## ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996  
Job No: 96.02915  
Sample No: 178817  
Account No: 52450  
Page 8

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-715 (10) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/08/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	77.0	%	n/a	S-5030	04/26/1996	1434
DOC	5,940	mg/kg	1,000	E-415.1	04/18/1996	75



NATIONAL ENVIRONMENTAL TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

NDNR No. 128033330

### ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/26/1996  
Job No: 96.02915  
Sample No: 178818  
Account No: 52450  
Page 9

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-716 (2) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/08/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	88.3	%	n/a	S-5030	04/26/1996	1434
DOC	<5,000	mg/kg	1,000	E-415.1	04/18/1996	75
TCLP ZHE VOLATILE PREP	Complete			S-1311	04/11/1996	123
TCLP-VOLATILES-8240						
TCLP-Benzene	<0.020	mg/L	0.020	S-8240	04/12/1996	222
Surr: Toluene-d8	92.6	%	n/a	S-8240	04/12/1996	222
Surr: Bromofluorobenzene	91.4	%	n/a	S-8240	04/12/1996	222
Surr: 1,2-Dichloroethane-d4	98.0	%	n/a	S-8240	04/12/1996	222



NATIONAL ENVIRONMENTAL TESTING, INC.

# CHAIN OF CUSTODY RECORD

COMPANY NATURAL RESOURCE TECHNOLOGY, INC.  
 ADDRESS 23713 WEST PAUL ROAD  
 PHONE (414) 523-9000 FAX (414) 523-9001  
 PROJECT NAME/LOCATION WPSC - SHEBOYGAN II  
 PROJECT NUMBER 1150-5.1  
 PROJECT MANAGER KOWATZ / GREENER

11002915  
 REPORT TO: R. KOEPKE  
 INVOICE TO: JANET  
 P.O. NO. 1150-5.1  
 NET QUOTE NO. \_\_\_\_\_

SAMPLED BY REBECCA J. KOEPKE  
 (PRINT NAME)  
 (PRINT NAME)

Rebecca J. Koepke  
 SIGNATURE  
 SIGNATURE

## ANALYSES

To assist us in selecting the proper method

Is this work being conducted for regulatory compliance monitoring? Yes  No

Is this work being conducted for regulatory enforcement action? Yes  No

Which regulations apply: RCRA  NPDES Wastewater   
 UST  Drinking Water   
 Other  None

DATE	TIME	SAMPLE ID/DESCRIPTION	MATRIX	GRAB	COMP	# and Type of Containers					OTHER	TOC	
						HCl	NaOH	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	OTHER			
01/04/96		SB-711(2)(S)	S	X							Z	X	X
04/04/96		SB-712(8)(S)	S	X							I		X
04/04/96		SB-713(8)(S)	S	X							I		X
04/04/96		SB-714(2)(S)	S	X							Z	X	X
04/04/96		SB-714(8)(S)	S	X							I		X
04/04/96		SB-715(2)(S)	S	X							Z	X	X
04/04/96		SB-715(10)(S)	S	X							I		X
04/04/96		SB-716(2)(S)	S	X							Z	X	X

COMMENTS

CONDITION OF SAMPLE: BOTTLES INTACT? YES/NO  YES / NO  
 FIELD FILTERED? YES/NO \_\_\_\_\_

COC SEALS PRESENT AND INTACT? YES / NO \_\_\_\_\_  
 VOLATILES FREE OF HEADSPACE? YES / NO \_\_\_\_\_

TEMPERATURE UPON RECEIPT: iced on ice  
 Bottles supplied by NET? YES/NO  YES / NO

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA \_\_\_\_\_  
 I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS \_\_\_\_\_ DATE \_\_\_\_\_

RELINQUISHED BY: <u>Rebecca J. Koepke</u>	DATE: <u>11/08/96</u>	TIME: <u>1545</u>	RECEIVED BY: <u>Jerry Schmidt</u>	RELINQUISHED BY: <u>Jerry Schmidt</u>	DATE: <u>4-8-96</u>	TIME: <u>1700</u>	RECEIVED FOR NET BY: <u>Rebecca J. Koepke</u>
METHOD OF SHIPMENT			REMARKS:				





NATIONAL ENVIRONMENTAL TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WDNR No. 128053530

## ANALYTICAL AND QUALITY CONTROL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/22/1996

Job No: 96.03078

Enclosed are the Analytical and Quality Control reports for the following samples submitted for analysis:

Sample Number	Sample Description	Date Taken	Date Received
179343	SB-712 (2) (S)	04/04/1996	04/11/1996
179344	SB-713 (2) (S)	04/04/1996	04/11/1996

**MASTER FILE COPY**  
**PROJECT #** 150 - Sheb II  
**CO:** \_\_\_\_\_

The above sample(s) may have a result flag shown on the report. The following are the result flag definitions:

A = Analyzed/extracted past hold time	B = Blank is contaminated
C = Standard outside of control limits	D = Diluted for analysis
F = Sample filtered in lab	G = Received past hold time
H = Late eluting hydrocarbons present	I = Improperly handled sample
J = Estimated concentration	L = Common lab solvent and contaminant
M = Matrix interference	P = Improperly preserved sample
Q = Result confirmed via re-analysis	S = Sediment present
T = Does not match typical pattern	W = BOD re-set due to missed dilution
X = Unidentified compound(s) present	Z = Internal standard outside limits

*Brian DeJong*

Brian D. DeJong, Organic Operations Manager  
Certification No. 128053530



NATIONAL ENVIRONMENTAL TESTING, INC.

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

LABOR No. 120053530

ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/22/1996  
Job No: 96.03078  
Sample No: 179343  
Account No: 52450  
Page 2

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-712 (2) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/11/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	83.1	%	n/a	S-5030	04/16/1996	1429
TCLP ZHE VOLATILE PREP	Complete			S-1311	04/15/1996	125
TCLP-VOLATILES-8240						
TCLP-Benzene	<0.020	mg/L	0.020	S-8240	04/18/1996	125 226
Surr: Toluene-d8	93.4	%	n/a	S-8240	04/18/1996	125 226
Surr: Bromofluorobenzene	93.8	%	n/a	S-8240	04/18/1996	125 226
Surr: 1,2-Dichloroethane-d4	97.2	%	n/a	S-8240	04/18/1996	125 226



**NATIONAL ENVIRONMENTAL TESTING, INC.**

Watertown Division  
602 Commerce Drive  
P.O. Box 288  
Watertown, WI 53094  
Tel: (414) 261-1660  
Fax: (414) 261-8120

WDNR No. 128053530

## ANALYTICAL REPORT

Ms. Becky Koepke  
NATURAL RESOURCE TECH, INC  
23713 W. Paul Road  
Pewaukee, WI 53072

04/22/1996  
Job No: 96.03078  
Sample No: 179344  
Account No: 52450  
Page 3

JOB DESCRIPTION: #1150-5.1 WPSC Sheboygan II  
PROJECT DESCRIPTION: Soil Analysis  
SAMPLE DESCRIPTION: SB-713 (2) (S)  
Recv'd On Ice

Date Taken: 04/04/1996

Date Received: 04/11/1996

Parameter	Results	Units	Reporting Limit	Method	Date Analyzed	Prep/Run Batch
Solids, Total	89.0	%	n/a	S-5030	04/16/1996	1429
TCLP ZHE VOLATILE PREP	Complete			S-1311	04/15/1996	125
TCLP-VOLATILES-8240						
TCLP-Benzene	<0.020	mg/L	0.020	S-8240	04/18/1996	125 226
Surr: Toluene-d8	91.0	%	n/a	S-8240	04/18/1996	125 226
Surr: Bromofluorobenzene	91.8	%	n/a	S-8240	04/18/1996	125 226
Surr: 1,2-Dichloroethane-d4	95.6	%	n/a	S-8240	04/18/1996	125 226



NATIONAL ENVIRONMENTAL TESTING, INC.

# CHAIN OF CUSTODY RECORD

9603078

COMPANY NATURAL RESOURCE TECHNOLOGY, INC.  
 ADDRESS 23713 WEST PAUL ROAD  
 PHONE (414) 523-9000 FAX (414) 523-9001  
 PROJECT NAME/LOCATION CUPSC. - SHEBOYGAN IL  
 PROJECT NUMBER 1150-5.1  
 PROJECT MANAGER KENWALD / GREENLEIF

REPORT TO: A. KOEPKE  
 INVOICE TO: JANET  
 P.O. NO. 1150-5.1  
 NET QUOTE NO. \_\_\_\_\_

SAMPLED BY ROBECCA J. KOEPKE  
 (PRINT NAME)

*[Signature]*  
 SIGNATURE

SIGNATURE

## ANALYSES

To assist us in selecting the proper method

Is this work being conducted for regulatory compliance monitoring? Yes \_\_\_ No \_\_\_

Is this work being conducted for regulatory enforcement action? Yes \_\_\_ No \_\_\_

Which regulations apply: RCRA \_\_\_ NPDES Wastewater \_\_\_  
 UST \_\_\_ Drinking Water \_\_\_  
 Other \_\_\_ None \_\_\_

DATE	TIME	SAMPLE ID/DESCRIPTION	MATRIX	GRAB	COMP	# and Type of Containers					OTHER	
						HCl	NaOH	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>			
24/4/96		SB-712 (2 Xs)	S	X							X	Biogenic TIC.P
24/4/96		SB-713 (2 Xs)	S	X							X	

## COMMENTS

CONDITION OF SAMPLE: BOTTLES INTACT? YES / NO FIELD FILTERED? YES / NO

COC SEALS PRESENT AND INTACT? YES / NO VOLATILES FREE OF HEADSPACE? YES / NO

TEMPERATURE UPON RECEIPT: acid on ice Bottles supplied by NET? YES / NO

SAMPLE REMAINDER DISPOSAL: RETURN SAMPLE REMAINDER TO CLIENT VIA \_\_\_\_\_  
 I REQUEST NET TO DISPOSE OF ALL SAMPLE REMAINDERS \_\_\_\_\_ DATE \_\_\_\_\_

RELINQUISHED BY: <i>[Signature]</i>	DATE: 4-11-96	TIME: 1545	RECEIVED BY: <i>[Signature]</i>	RELINQUISHED BY: <i>[Signature]</i>	DATE: 4-11-96	TIME: 1740	RECEIVED FOR NET BY: <i>[Signature]</i>	DATE: 4-12-96
METHOD OF SHIPMENT			REMARKS:					

*[Handwritten notes]*  
 4112  
 0915

**PHASE I, II AND OFF-SITE INVESTIGATION**

**APPENDIX B**



Table 2-1

**Phase I Soil Analytical Summary  
WPSC Sheboygan II - North Water Street**

Sampling Location	Sampling Depth (feet)	Benzene $\mu\text{g}/\text{kg}$	Ethyl-benzene $\mu\text{g}/\text{kg}$	Toluene $\mu\text{g}/\text{kg}$	Total Xylene $\mu\text{g}/\text{kg}$	Total BETX $\mu\text{g}/\text{kg}$	Arsenic $\text{mg}/\text{kg}$	Nickel $\text{mg}/\text{kg}$	Cyanide Amenable $\text{mg}/\text{kg}$	Cyanide Disso-ciable $\text{mg}/\text{kg}$	Cyanide Total $\text{mg}/\text{kg}$
<b>Surface Soil Samples</b>											
CS-101B	0 - 0.25	<100	<100	<100	<100	0	na	na	<2.5	<2.5	<2.5
CS-101C	0 - 0.25	<100	<100	<100	<100	0	na	na	<0.25	<0.25	<0.25
CS-101D	0 - 0.25	<100	<100	<100	<100	0	na	na	<2.5	<2.5	<2.5
CS-102B	0 - 0.25	<100	<100	<100	<100	0	na	na	<2.5	<2.5	<2.5
CS-102D	0 - 0.25	<100	<100	<100	<100	0	na	na	<2.5	<2.5	<2.5
CS-103C	0 - 0.25	<100	<100	<100	<100	0	na	na	<2.5	<2.5	<2.5
<b>Test Pit Soil Samples</b>											
TP-101	5	<100	<100	<100	<100	0	3.4	14	<0.80	0.65	0.80
TP-102	5	<100	<100	<100	<100	0	0.9	7	<0.19	<0.25	0.19
TP-103	7	<100	<100	<100	<100	0	0.9	10	<8.5	1.9	8.5
TP-104	6.5	<100	<100	<100	<100	0	na	na	<2.5	<2.5	<2.5
TP-106	5	300	200	<100	<100	500	na	na	<0.83	0.64	0.83
TP-107	2	900	<100	<100	200	1100	na	na	<2.5	<2.5	<2.5
TP-108	5	<100	<100	<100	<100	0	0.5	10	<2.5	<0.25	<2.5
TP-109	5	5500	2200	4600	5100	17400	0.6	11	<3.0	1.1	3.0
TP-110	1.5	<100	<100	100	300	400	2.8	10	0.17	0.92	9.5
TP-111	5	<100	<100	<100	<100	0	na	na	1.03	<2.5	1.8
TP-112	5	<100	<100	<100	<100	0	na	na	<2.5	<2.5	<2.5
TP-113	5	<100	1600	<100	500	2100	1.1	10	2.5	<0.25	<2.5
TP-114	5	<100	<100	<100	<100	0	na	na	<2.5	<2.5	<2.5
<b>NR 720 Residual Contaminant Levels (RCLs)</b>											
Protective of Groundwater		5.5	2900	1500	4100	ns	0.039	ns	ns	ns	ns

ns: A NR 720 RCL has not been established for this parameter.

na: Analysis was not performed.

<100: Less than method detection limit of 100  $\mu\text{g}/\text{kg}$ .

Notes: 1. Samples exceeding the NR 720 RCL are shaded

2. See Appendix D of the Phase I report (HSI (1), 1992) for a complete list of analytical parameters.

3. Phase I samples were collected by Simon Hydro-Search

Table 2-1 Continued...  
Phase I Soil Analytical Summary

Sampling Location	Sampling Depth (feet)	Acenaphthene (mg/kg)	Acenaphthylene (mg/kg)	Anthracene (mg/kg)	Benzo(a)anthracene (mg/kg)	Benzo(a)pyrene (mg/kg)	Benzo(b)fluoranthene (mg/kg)	Benzo(k)fluoranthene (mg/kg)	Benzo(g,h,i)perylene (mg/kg)	Chrysene (mg/kg)
<b>Surface Soil Samples</b>										
CS-101B	0 - 0.25	<0.02	<0.02	<0.01	<0.012	0.031	0.024	0.057	<0.012	<0.024
CS-101C	0 - 0.25	<0.02	<0.02	<0.01	<0.012	<0.003	<0.008	<0.004	<0.012	<0.024
CS-101D	0 - 0.25	<0.02	<0.02	<0.01	<0.012	<0.003	<0.008	<0.004	<0.012	<0.024
CS-102B	0 - 0.25	<0.02	<0.02	<0.01	<0.012	<0.003	<0.008	<0.004	<0.012	<0.024
CS-102D	0 - 0.25	<0.02	<0.02	<0.01	<0.012	<0.003	<0.008	<0.004	<0.012	<0.024
CS-103C	0 - 0.25	<0.02	<0.02	<0.01	<0.012	0.013	0.019	0.033	<0.012	<0.024
<b>Test Pit Soil Samples</b>										
TP-101	5	<2.7	<2.7	<2.7	11	11	8.8	10	7	9.9
TP-102	5	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66
TP-103	7	11	<0.66	1.6	3.8	3.5	3.2	3.4	2.1	3.4
TP-104	6.5	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66
TP-106	5	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66
TP-107	5	<6.6	<6.6	<6.6	13	15	13	16	14	13
TP-108	5	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66
TP-109	5	<6.6	<6.6	<6.6	13	13	11	15	10	13
TP-110	1.5	<3.3	<3.3	<3.3	13	16	7.3	23	12	14
TP-111	5	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	0.7
TP-112	5	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66
TP-113	5	3.1	<1.32	2.7	1.9	1.5	<1.32	<1.32	<1.32	<1.32
TP-114	5	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66	<0.66

ns: A NR 720 RCL has not been established for this parameter.

na: Analysis was not performed.

<100: Less than method detection limit of 100 ug/kg.

- Notes:
1. Samples exceeding the NR 720 RCL are shaded.
  2. See Appendix D of the Phase I report (HSI (1), 1992) for a complete list of analytical parameters.
  3. Phase I samples were collected by Simon Hydro-Search

Table 2-1 Continued...  
Phase I Soil Analytical Summary

Sampling Location	Sampling Depth (feet)	Dibenzo (a,h) anthracene (mg/kg)	Fluor-anthene (mg/kg)	Fluorene (mg/kg)	Indeno (1,2,3) pyrene (mg/kg)	Naphthalene (mg/kg)	Phenanthrene (mg/kg)	Pyrene (mg/kg)	Total PAHs (mg/kg)	Phenol (mg/kg)
<b>Surface Soil Samples</b>										
CS-101B	0 - 0.25	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0.1	<0.66
CS-101C	0 - 0.25	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0	<0.66
CS-101D	0 - 0.25	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0	<0.66
CS-102B	0 - 0.25	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0	<0.66
CS-102D	0 - 0.25	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0	<0.66
CS-103C	0 - 0.25	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0.065	<0.66
<b>Test Pit Soil Samples</b>										
TP-101	5	3.1	15	<mdl	7	<mdl	4.4	14	101.2	2.7
TP-102	5	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0	<0.66
TP-103	7	0.98	6.9	1.2	2.1	<0.01	5.4	6.2	44.9	<0.66
TP-104	6.5	<0.002	<0.012	<0.024	<0.008	4.3	<0.016	<0.032	4.3	<0.66
TP-106	5	<0.002	18	<0.024	<0.008	<0.01	18	20	56	13.2
TP-107	5	<0.002	18	<0.024	13	<0.01	7.9	6.6	122.9	<6.6
TP-108	5	<0.002	0.86	<0.024	<0.008	0.68	2	1	4.5	<0.66
TP-109	5	<6.6	23	<0.024	9.2	<0.01	14	24	145.2	<6.6
TP-110	1.5	4.6	17	<0.024	11	8	5.4	20	151.3	<3.3
TP-111	5	<0.002	0.9	<0.024	<0.008	<0.01	<0.016	0.94	30.4	<0.66
TP-112	5	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0	<0.66
TP-113	5	<0.002	4.3	2.6	<0.008	8.5	10	5.3	39.9	<1.32
TP-114	5	<0.002	<0.012	<0.024	<0.008	<0.01	<0.016	<0.032	0	<0.66

ns: A NR 720 RCL has not been established for this parameter.

na: Analysis was not performed.

<100: Less than method detection limit of 100 ug/kg.

Notes: 1. Samples exceeding the NR 720 RCL are shaded.

2. See Appendix D of the Phase I report (HSI (1), 1992) for a complete list of analytical parameters.

3. Phase I samples were collected by Simon Hydro-Search



Table 2-2

**Phase I Groundwater Analytical Summary  
WPSC Sheboygan II - North Water Street**

Sampling Location and Depth (feet)	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Total Xylene (µg/L)	Total BETX (µg/L)	Acenaphthene (µg/L)	Acenaphthylene (µg/L)	Anthracene (µg/L)
TP-101 (10)	<1	<1	<1	<1	0	<0.4	<0.5	<0.6
TP-107 (5.5)	<b>1,700</b>	<b><u>380</u></b>	<b><u>170</u></b>	<b><u>280</u></b>	2,530	<200	<250	<20
TP-110 (5.5)	<b><u>2.6</u></b>	1.4	2.6	2.9	9.5	<4	<5	<2
<b>Wisconsin Groundwater Quality Standards (NR 140)</b>								
Preventive Action Limit (PAL)	0.5	140	68.6	124	ns	ns	ns	ns
Enforcement Standard (ES)	5	700	343	620	ns	ns	ns	ns

Sampling Location and Depth (feet)	DRO (mg/L)	Phenols (mg/L)	Cyanide (amenable) (mg/L)	Cyanide (dissociable) (mg/L)	Cyanide (total) (mg/L)	Arsenic (mg/L)	Nickel (mg/L)
TP-101 (10')	na	<0.010	0.18	0.085	<b>0.37</b>	<b><u>0.006</u></b>	<0.1
TP-107 (5.5')	5	0.026	0.048	0.057	<b>0.30</b>	<b><u>0.005</u></b>	<0.1
TP-110 (5.5')	na	<0.010	0.028	0.15	<b>0.23</b>	<b><u>0.019</u></b>	<0.1
<b>Wisconsin Groundwater Quality Standards (NR 140)</b>							
Preventive Action Limit (PAL)	ns	1.20	ns	ns	0.04	0.005	ns
Enforcement Standard (ES)	ns	6.00	ns	ns	0.20	0.050	ns

na: Parameter not analyzed for this sample.

ns: NR 140 ES or PAL standards have not been established for this parameter.

Notes: 1. Samples exceeding the ES are bolded and shaded. Samples exceeding the PAL are bolded and underlined.  
2. Phase I samples were collected by Simon Hydro-Search.

Table 2-2 Continued...  
Phase I Groundwater Analytical Summary

Sampling Location and Depth (feet)	Benzo (a) anthracene (µg/L)	Benzo (b) fluoranthene (µg/L)	Benzo (k) fluoranthene (µg/L)	Benzo (a) pyrene (µg/L)	Benzo (ghi) perylene (µg/L)	Chrysene (µg/L)	Dibenzo (a,h) anthracene (µg/L)
TP-101 (10')	<0.3	<0.02	<0.1	<0.08	<3	<0.4	<0.05
TP-107 (5.5')	<30	<2	<10	<8	<30	<40	<5
TP-110 (5.5')	<3	<0.2	<1	<0.8	<3	<4	<0.5
<b>Wisconsin Groundwater Quality Standards (NR 140)</b>							
Preventive Action Limit (PAL)	ns	ns	ns	0.02	ns	ns	ns
Enforcement Standards (ES)	ns	ns	ns	0.2	ns	ns	ns

Sampling Location and Depth (feet)	Fluoranthene (µg/L)	Fluorene (µg/L)	Indeno (1,2,3-cd) pyrene (µg/L)	Naphthalene (µg/L)	Phenanthrene (µg/L)	Pyrene (µg/L)	Total PAH (µg/L)
TP-101 (10')	0.7	<0.6	<0.2	0.3	2	<0.8	3.0
TP-107 (5.5')	<30	<300	<20	<b>780</b>	<40	<80	780
TP-110 (5.5')	<3	<6	<2	<2	<4	<8	0
<b>Wisconsin Groundwater Quality Standards (NR 140)</b>							
Preventive Action Limit (PAL)	ns	80	ns	8	ns	ns	ns
Enforcement Standard (ES)	ns	400	ns	40	ns	ns	ns

na: Parameter not analyzed for this sample.

ns: NR 140 ES or PAL standards have not been established for this parameter.

- Notes: 1. Samples exceeding the ES are bolded and shaded. Samples exceeding the PAL are bolded and underlined.  
2. Phase I samples were collected by Simon Hydro-Search.

Table 4-1

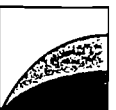
Monitoring Well Construction and Water Level Elevation Data  
 WPSC Sheboygan II - North Water Street

Well	TOC <sup>A</sup> Elevation (feet) <sup>B</sup>	Ground Surface Elevation (feet) <sup>B</sup>	Well Depth (feet)	Measurement Date	Depth to Water from TOC <sup>A</sup> (feet)	Groundwater Elevation (feet) <sup>B</sup>
<b>Water Table Wells</b>						
MW-701	588.51	588.97	13.40	08/14/95	5.51	583.00
				09/25/95	5.58	582.93
				10/20/95	5.63	582.88
MW-702	590.09	590.39	13.40	08/14/95	4.86	585.23
				09/25/95	4.88	585.21
				10/20/95	4.69	585.40
MW-703	588.80	589.16	13.46	08/14/95	5.63	583.17
				09/25/95	5.74	583.06
				10/20/95	5.69	583.11
MW-704	589.05	589.43	13.20	08/14/95	5.93	583.12
				09/25/95	6.00	583.05
				10/20/95	5.96	583.09
MW-705	589.91	590.22	13.45	08/14/95	6.95	582.96
				09/25/95	6.09	583.82
				10/20/95	6.07	583.84
MW-706	591.34	591.51	13.4 <sup>C</sup>	08/14/95	3.5 <sup>C</sup>	587.8 <sup>C</sup>
				09/25/95	3.6 <sup>C</sup>	587.7 <sup>C</sup>
				10/20/95	3.4 <sup>C</sup>	587.9 <sup>C</sup>
MW-707	590.08	590.29	13.35	08/14/95	7.48	582.60
				09/25/95	7.67	582.41
				10/20/95	7.71	582.37
<b>Piezometers</b>						
PZ-701	588.89	589.28	33.80	08/14/95	13.27	575.62
				09/25/95	16.26	572.63
				10/20/95	15.15	573.74
<b>Staff Gauge</b>						
SG-701	582.02	na	na	08/15/95	2.00	580.02
				09/25/95	2.49	579.53
				10/20/95	2.33	579.69

A: TOC - Top of Well Casing.

B: Elevations relative to National Vertical Geodetic Datum (mean sea level).

C: Monitoring well MW-706 contains coal tar. Due to the difficulty with field decontamination for coal tar, depth to water is measured with a tape measure and not a water level indicator. Therefore, the water level is estimated to the 10th of an inch.



**Table 4-2**

**Hydraulic Conductivity (K) and Grain Size Analysis Results  
Wpsc Sheboygan II - North Water Street**

Well	Sampling Depth (feet)	General Grain Size Range				K (ft/min)	K (cm/sec)	K Ranges <sup>A</sup> (cm/sec)
		Gravel	Sand	Fines	Clay			
MW-701	6-10	6.6%	61.0%	25.0%	7.4%	6.2e-05 L	3.2e-05	Clean Sand: 3E-04 to 1 Silty Sand: 8E-06 to 9E-02 Silt, Loess: 10E-7 to 3E-03 Glacial Till: 8E-11 to 2E-04 Unweathered Clay: 5E-11 to 2E-07 Limestone/Dolomite: 7E-08 to 3E-04 Karst Limestone: 9E-05 to 1 Fractured Rock: 6E-07 to 2E-02  <sup>A</sup> Values from "GROUNDWATER" Freeze and Cherry, 1979, p. 29
MW-702	7-11	33.7%	56.0%	10.3%		4.5e-05 L	2.3e-05	
MW-703	8-10	2.3%	36.4%	49.1%	12.2%	2.5e-04 H	1.3e-04	
MW-704	6-10	36.3%	53.6%	10.1%		No Results		
MW-705	4-6	17.7%	57.1%	25.2%		2.5e-05 L	1.2e-05	
MW-706	6-10	1.9%	60.3%	29.9%	7.9%	No Results		
MW-707	2-6	3.7%	23.9%	50.4%	22.0%	1.0e-04 H	5.1e-05	
PZ-701	29-33	0.0%	12.3%	32.7%	55.0%	No Results		

Table 4-3

**Phase II Soil Analytical Summary  
WPC Sheboygan II - North Water Street**

Sample Location (Depth - feet)	Benzene ( $\mu\text{g}/\text{kg}$ )	Toluene ( $\mu\text{g}/\text{kg}$ )	Ethyl- benzene ( $\mu\text{g}/\text{kg}$ )	Xylene total ( $\mu\text{g}/\text{kg}$ )	Total BETX ( $\mu\text{g}/\text{kg}$ )	Phenol ( $\text{mg}/\text{kg}$ )
<b>Monitoring Well Samples</b>						
MW-701(4'-6')	<16	<16	310	160	470	1.9
MW-702 (2'-4')	<16	<16	50	160	210	1.2
MW-703 (4'-6')	13	6.1	<5.0	6.9	26	0.97
MW-704 (2'-4')	<5.0	<5.0	<5.0	<15	0	0.55
MW-705 (2'-4')	<5.0	<5.0	<5.0	<15	0	0.76
MW-706 (2'-4')	<5.0	<5.0	<5.0	<15	0	0.68
MW-707 (2'-4')	<5.0	<5.0	<5.0	<15	0	83
<b>Soil Boring Samples</b>						
SB-701 (2'-4')	<5.0	<5.0	<5.0	<15	0	0.63
<b>NR 720 Residual Contaminant Levels (RCLs)</b>						
Protective of Groundwater	5.5	2900	1500	4100	ns	ns

Sample Location (Depth - feet)	Anthracene ( $\text{mg}/\text{kg}$ )	Benzo (a) anthracene ( $\text{mg}/\text{kg}$ )	Benzo (b) fluoranthene ( $\text{mg}/\text{kg}$ )	Benzo (k) fluoranthene ( $\text{mg}/\text{kg}$ )	Benzo (a) pyrene ( $\text{mg}/\text{kg}$ )	Benzo (ghi) perylene ( $\text{mg}/\text{kg}$ )	Chrysene ( $\text{mg}/\text{kg}$ )
<b>Monitoring Well Samples</b>							
MW-701 (2'-4)	15	2.3	0.95	0.88	1.7	2.9	1.6
MW-702 (2'-4')	0.21	1.1	0.66	0.53	1.2	1.2	0.74
MW-703 (2'-4')	1.3	3.8	2.3	0.077	3.8	5.1	2.8
MW-704 (4'-6')	0.015	0.015	0.004	0.0036	<0.008	<0.004	0.0078
MW-705 (2'-4')	0.5	1.7	1.0	0.88	1.7	2.1	1.3
MW-706 (2'-4')	<0.008	<0.002	<0.002	<0.002	<0.008	<0.004	<0.004
MW-707 (4'-6')	0.068	0.33	0.18	0.16	0.43	0.48	0.23
<b>Soil Boring Samples</b>							
SB-701 (2'-4')	0.23	0.91	0.49	0.38	0.74	0.89	0.68

ns: A NR 720 RCL has not been established for this parameter.

<5.0: Less than method detection limit of 5.0.

Notes: 1. Samples exceeding the NR 720 RCL are shaded.

2. A parameter is listed if detected in at least one sample. See Appendix B for a complete list of analytical parameters.

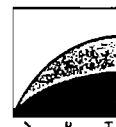




Table 4-3 Continued...  
Phase II Soil Analytical Summary

Sample Location (Depth - feet)	Dibenzo (a,h) anthracene (mg/kg)	Fluor- anthene (mg/kg)	Fluorene (mg/kg)	Indeno (1,2,3-cd) pyrene (mg/kg)	Naph- thalene (mg/kg)	Phenan- threne (mg/kg)	Pyrene (mg/kg)	Total PAHs (mg/kg)
<b>Monitoring Well Samples</b>								
MW-701 (2'-4')	0.18	17	13	1.3	77	53	10	196.8
MW-702 (2'-4')	0.15	2.1	0.11	0.75	<0.04	0.48	1.1	10.3
MW-703 (4'-6')	0.64	12.0	0.95	3.1	3.0	5.6	7.3	51.8
MW-704 (2'-4')	<0.004	0.04	0.028	<0.004	<0.04	0.091	0.021	0.2
MW-705 (2'-4')	0.27	4.4	0.36	1.1	<0.04	1.7	1.8	18.9
MW-706 (2'-4')	<0.004	<0.008	<0.016	<0.004	<0.04	<0.016	<0.008	0
MW-707 (2'-4')	0.063	0.64	0.065	0.33	<0.04	0.21	0.75	3.9
<b>Soil Boring Samples</b>								
SB-701 (2'-4')	0.093	2.5	0.17	0.5	<0.04	1.0	0.81	9.4

ns: A NR 720 RCL has not been established for this parameter.

5.0: Less than method detection limit of 5.0.

Notes: 1. Samples exceeding the NR 720 RCL are shaded.

2. A parameter is listed if detected in at least one sample. See Appendix B for a complete list of analytical parameters.

Table 4-4

**Phase II Groundwater Analytical Summary  
WPC Sheboygan II - North Water Street**

Sampling Location	Sampling Date	Benzene (µg/L)	Ethylbenzene (µg/L)	Toluene (µg/L)	Total Xylene (µg/L)	Total BETX (µg/L)	Acenaphthene (µg/L)	Acenaphthylene (µg/L)	Anthracene (µg/L)
<b>Water Table Monitoring Well Samples</b>									
MW-701	08/15/95	<b>10,000</b>	<b>880</b>	<b>96</b>	<b>820</b>	11,796	800	<2.0	23
	09/25/95	<b>12,000</b>	<b>780</b>	53	<b>680</b>	13,513	680	1,100	17
MW-702	08/15/95	<b>5,900</b>	<b>1,500</b>	<b>2,300</b>	<b>1,600</b>	11,300	390	<2.0	19
	09/25/95	<b>6,100</b>	<b>1,400</b>	<b>2,100</b>	<b>1,400</b>	11,000	400	1,400	17
MW-703	08/15/95	<b>1,300</b>	<b>980</b>	29	<b>430</b>	2,739	180	<2.0	17
	09/25/95	<b>1,300</b>	<b>1,100</b>	23	<b>450</b>	2,873	220	430	14
MW-704	08/15/95	<b>340</b>	<b>280</b>	<b>200</b>	<b>430</b>	1,250	770	<2.0	44
	09/25/95	<b>1,100</b>	<b>670</b>	<b>380</b>	<b>970</b>	3,120	440	1,400	20
MW-705	08/15/95	<1.0	<1.0	<1.0	<3.0	0	<1.0	<2.0	<0.20
	09/25/95	<0.50	<1.0	<1.0	<3.0	0	<1.0	<2.0	<0.20
MW-706	08/15/95	<b>34,000</b>	<b>560</b>	<b>13,000</b>	<b>7,900</b>	55,460	197,000	1,480,000	177,000
	09/25/95	<b>31,000</b>	<2,500	<b>12,000</b>	<b>7,700</b>	50,700	9,400	82,000	15,000
MW-707	08/15/95	<b>1,500</b>	<b>3,600</b>	<b>190</b>	<b>1,400</b>	6,690	430	<2.0	12
	09/25/95	<b>1,200</b>	<b>3,500</b>	<b>130</b>	<b>1,200</b>	6,030	240	1,400	10
<b>Piezometer Samples</b>									
PZ-701	08/17/95	<b>5.0</b>	3.6	6.3	11	25.9	<1.0	<2.0	1.5
	09/26/95	<b>2.2</b>	1.7	6.6	6.8	17.3	<1.0	<2.0	0.25
<b>Quality Control / Quality Assurance Samples</b>									
MW-799 (MW-704 dup.)	08/15/95	<b>310</b>	<b>280</b>	<b>190</b>	<b>440</b>	1,220	660	<2.0	44
	09/25/95	<b>1,100</b>	<b>610</b>	<b>360</b>	<b>900</b>	2,970	420	1,100	64
Trip Blank	08/15/95	<1.0	<1.0	<1.0	<3.0	0	na	na	na
	09/25/95	<0.50	<1.0	<1.0	<3.0	0	na	na	na
<b>Wisconsin Groundwater Quality Standards (NR 140.10 and 140.12)</b>									
Preventive Action Limit (PAL)		0.5	140	68.6	124	ns	ns	ns	ns
Enforcement Standard (ES)		5	700	343	620	ns	ns	ns	ns

na: Parameter not analyzed for this sample.

ns: NR 140 ES or PAL standards have not been established for this parameter.

<1.0: Less than method detection limit of 1.0.

Note: 1. Samples exceeding the ES are bolded and shaded. Samples exceeding the PAL are bolded and underlined.

2. A parameter is listed if detected in at least one sample. See Appendix D for a complete list of analytical parameters.



na: Parameter not analyzed for this sample.  
 ns: NR 140 ES or PAL standards have not been established for this parameter.  
 <1.0: Less than method detection limit of 1.0.  
 Note: 1. Samples exceeding the ES are bolded and shaded. Samples exceeding the PAL are bolded and underlined.  
 2. A parameter is listed if detected in at least one sample. See Appendix D for a complete list of analytical parameters.

Sampling Location	Sampling Date	Benzo (a) anthracene (µg/L)	Benzo (b) fluoranthene (µg/L)	Benzo (k) fluoranthene (µg/L)	Benzo (a) pyrene (µg/L)	Benzo (ghi) perylene (µg/L)	Chrysene (µg/L)	Dibenzo (a,h) anthracene (µg/L)
<b>Water Table Monitoring Well Samples</b>								
MW-701	08/15/95	3.4	0.60	0.54	1.8	1.2	1.7	0.25
	09/25/95	2.0	0.24	0.30	1.0	0.67	1.0	0.40
MW-702	08/15/95	2.9	0.32	0.48	1.4	0.93	1.5	0.23
	09/25/95	3.7	0.66	0.73	1.8	1.6	1.9	0.28
MW-703	08/15/95	1.4	0.10	0.16	0.46	0.24	0.55	0.17
	09/25/95	1.2	0.05	0.12	0.37	0.34	0.51	0.23
MW-704	08/15/95	26	8.9	7.9	22	17	19	<0.10
	09/25/95	5.0	2.7	2.3	3.1	<0.10	3.5	<0.10
MW-705	08/15/95	<0.050	<0.050	<0.050	<0.20	<0.10	<0.10	<0.10
	09/25/95	<0.050	<0.050	<0.050	<0.20	<0.10	<0.10	<0.10
MW-706	08/15/95	129,000	31,000	29,000	83,000	62,000	82,000	13,000
	09/25/95	11,000	2,400	980	6,700	4,900	5,400	<10 m
MW-707	08/15/95	2.2	0.38	0.52	1.6	1.3	1.3	0.25
	09/25/95	0.40	0.23	0.19	0.66	0.83	0.64	0.40
<b>Piezometer Samples</b>								
PZ-701	08/17/95	0.89	0.21	0.18	0.43	0.24	0.61	<0.10
	09/26/95	0.13	<0.050	<0.050	<0.20	<0.10	0.13	<0.10
<b>Quality Assurance / Quality Control Samples</b>								
MW-799	08/15/95	25	8.7	7.3	21	16	19	<0.10
	09/25/95	46	14	15	38	31	31	3.2
Trip Blank	08/15/95	na	na	na	na	na	na	na
	09/25/95	na	na	na	na	na	na	na
<b>Wisconsin Groundwater Quality Standards (NR 140.10 and 140.12)</b>								
Preventive Action Limit (PAL)		ns	ns	ns	0.02	ns	ns	ns
Enforcement Standards (ES)		ns	ns	ns	0.2	ns	ns	ns

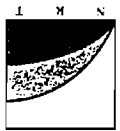


Table 4-4 continued...  
Phase II Groundwater Analytical Summary

Sampling Location	Date	Fluoranthene (µg/L)	Fluorene (µg/L)	Indeno (1,2,3-cd) pyrene (µg/L)	Naphthalene (µg/L)	Phenanthrene (µg/L)	Pyrene (µg/L)	Total PAHs (µg/L)
MW-701	08/15/95	49	130	0.76	220	100	20	1,352.25
	09/25/95	29	100	0.36	3,800	81	11	5,823.97
MW-702	08/15/95	41	150	0.55	7,300	96	35	8,039.31
	09/25/95	32	140	0.76	6,400	90	13	8,503.43
MW-703	08/15/95	28	70	0.16	2,400	74	9.2	2,781.44
	09/25/95	19	54	0.19	2,700	58	5.9	3,503.91
MW-704	08/15/95	150	180	10	5,200	220	56	6,730.8
	09/25/95	36	120	<0.10	4,200	120	13	6,365.6
MW-705	08/15/95	<0.20	<0.40	<0.10	<1.0	<0.40	<0.20	0
	09/25/95	<0.20	<0.40	<0.10	<1.0	<0.40	<0.20	0
MW-706	08/15/95	266,000	640,000	32,000	1,900,000	730,000	142,000	5,993,000
	09/25/95	8,400	57,000	2,700	166,000	56,000	9,700	437,580
MW-707	08/15/95	27	93	0.74	3,100	60	12	3,742.29
	09/25/95	21	81	0.35	3,400	60	4.8	5,220.5
PZ-701	08/17/95	3.3	1.0	<0.10	<1.0	6.6	2.1	17.06
	09/26/95	0.70	<0.40	<0.10	<1.0	0.80	0.77	2.78
Quality Assurance / Quality Control Samples								
MW-799	08/15/95	140	190	9.2	3,600	220	55	5,015.2
	09/25/95	210	170	20	3,100	310	83	5,655.2
Trip Blank	08/15/95	na	na	na	na	na	na	na
	09/25/95	na	na	na	na	na	na	na
Wisconsin Groundwater Quality Standards (NR 140.10 and 140.12)								
Preventive Action Limit (PAL)	ns	ns	80	ns	8	ns	ns	ns
Enforcement Standard (ES)	ns	ns	400	ns	40	ns	ns	ns

na: Parameter not analyzed for this sample.  
 ns: NR 140 ES or PAL standards have not been established for this parameter.  
 <1.0: Less than method detection limit of 1.0.  
 Note: 1. Samples exceeding the ES are bolded and shaded. Samples exceeding the PAL are bolded and underlined.  
 2. A parameter is listed if detected in at least one sample. See Appendix D for a complete list of analytical parameters.

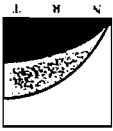


Table 4-4 continued...  
 Phase II Groundwater Analytical Summary

Sampling Location	Date	Cyanide (amenable) (mg/L)	Cyanide (dissociable) (mg/L)	Cyanide (total) (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Lead (mg/L)
MW-701	08/15/95	<0.0050	0.025	<u>0.11</u>	<0.0030	<u>0.44</u>	<0.0015
	09/25/95	<0.0050	0.020	<u>0.088</u>	na	na	na
MW-702	08/15/95	<0.0050	0.043	<u>0.20</u>	<u>0.0062</u>	0.25	<0.0015
	09/25/95	<0.0050	0.032	<u>0.072</u>	na	na	na
MW-703	08/15/95	<0.0050	0.039	<u>0.12</u>	<0.0030	0.19	<0.0015
	09/25/95	<0.0050	0.028	<u>0.14</u>	na	na	na
MW-704	08/15/95	<0.0050	0.056	<u>0.31</u>	<0.0030	0.31	<0.0015
	09/25/95	<0.0050	0.062	<u>0.28</u>	na	na	na
MW-705	08/15/95	<0.0050	<0.0050	<0.0050	0.0039	0.11	<0.0015
	09/25/95	<0.0050	<0.0050	<0.0050	na	na	na
MW-706	08/15/95	<0.0050	<0.0050	<0.0050	<0.0030	0.16	<0.0015
	09/25/95	<0.0050	<0.0050	<0.0050	na	na	na
MW-707	08/15/95	0.21	0.042	<u>0.38</u>	<0.003	0.21	<0.0015
	09/25/95	<0.0050	0.058	<u>0.44</u>	na	na	na
Piezometer Samples							
PZ-701	08/17/95	0.020	<0.0050	0.020	<0.0030	0.063	<u>0.0003</u>
	09/26/95	0.014	<0.0050	0.014	na	na	na
Quality Assurance / Quality Control Samples							
MW-799	08/15/95	0.19	0.022	<u>0.29</u>	<0.0030	0.29	<0.0015
	09/25/95	0.020	0.41	<u>0.36</u>	na	na	na
Trip Blank	08/15/95	na	na	na	na	na	na
	09/25/95	na	na	na	na	na	na
Wisconsin Groundwater Quality Standards (NR 140.10 and 140.12)							
Preventive Action Limit	ns	ns	ns	0.04	0.005	0.4	0.0015
Enforcement Standard (ES)	ns	ns	ns	0.2	0.05	2	0.015

na: Parameter not analyzed for this sample.  
 ns: NR 140 ES or PAL standards have not been established for this parameter.  
 <1.0: Less than method detection limit of 1.0.

Note: 1. Samples exceeding the ES are bolded and shaded. Samples exceeding the PAL are bolded and underlined.  
 2. A parameter is listed if detected in at least one sample. See Appendix D for a complete list of analytical parameters.



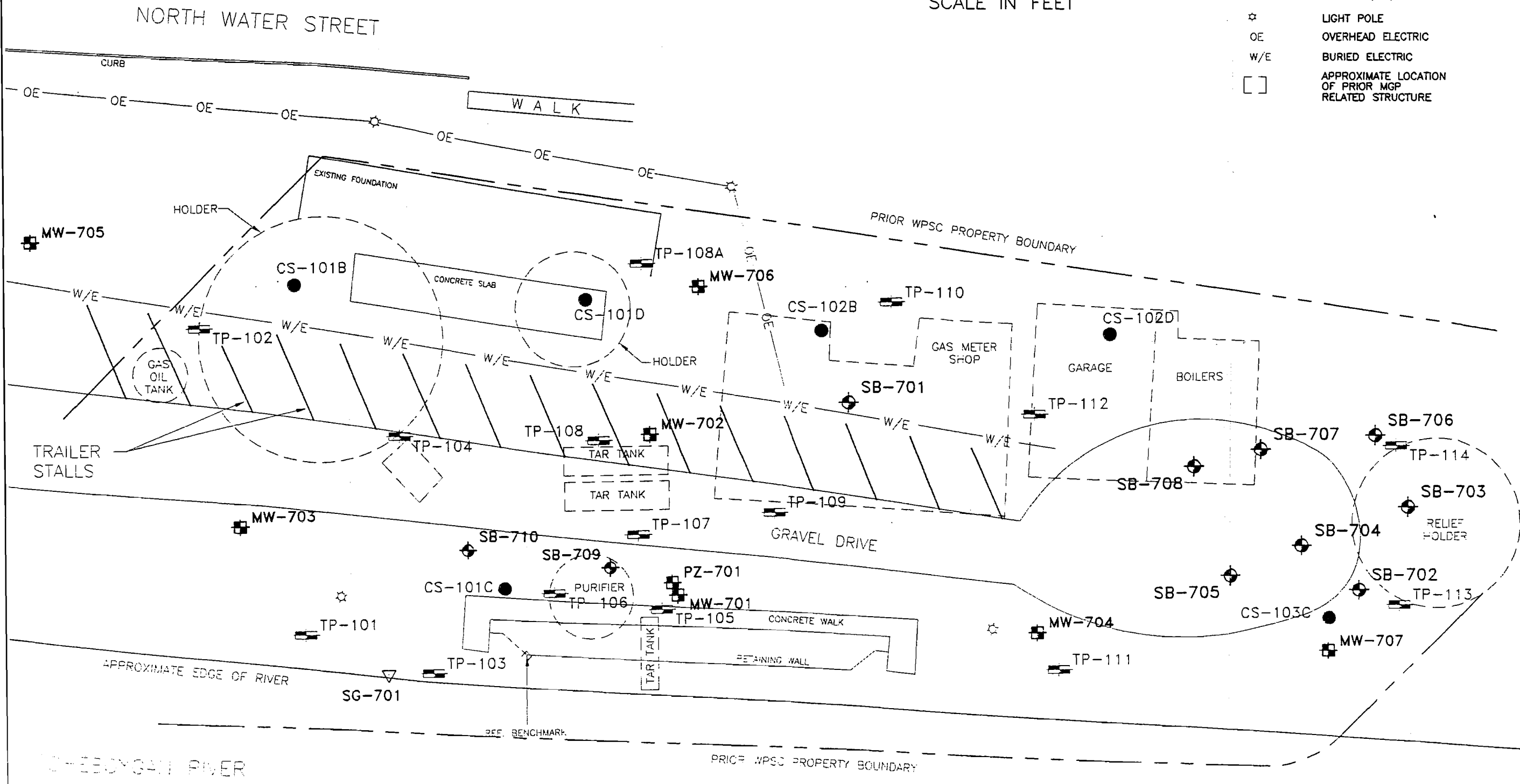
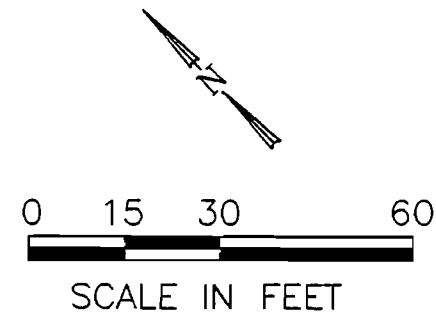
**SOURCE NOTE:**

1. THIS DRAWING WAS MODIFIED FROM A MAP SURVEYED BY HINZE & ASSOCIATES, INC., SHEBOYGAN, WISCONSIN, REGISTERED LAND SURVEYORS, JOB NO. D-2091, DATED SEPTEMBER 4, 1995.

2. PHASE I SAMPLING LOCATIONS REFERENCED FROM SIMON HYDRO-SEARCH'S 1992 "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE SHEBOYGAN, WISCONSIN", REPORT.

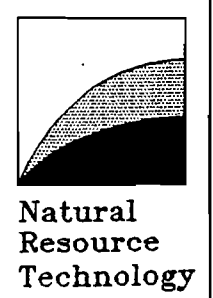
**LEGEND**

- ⊕ MW-701 MONITORING WELL
- ⊕ PZ-701 PIEZOMETER
- ⊕ SB-702 SOIL BORING
- ▽ SG-701 STAFF GAUGE
- ▬ TP-101 TEST PIT (HSI)
- CS-103B SURFACE SOIL SAMPLE (HSI)
- ☆ LIGHT POLE
- OE OVERHEAD ELECTRIC
- W/E BURIED ELECTRIC
- APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE



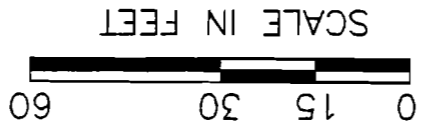
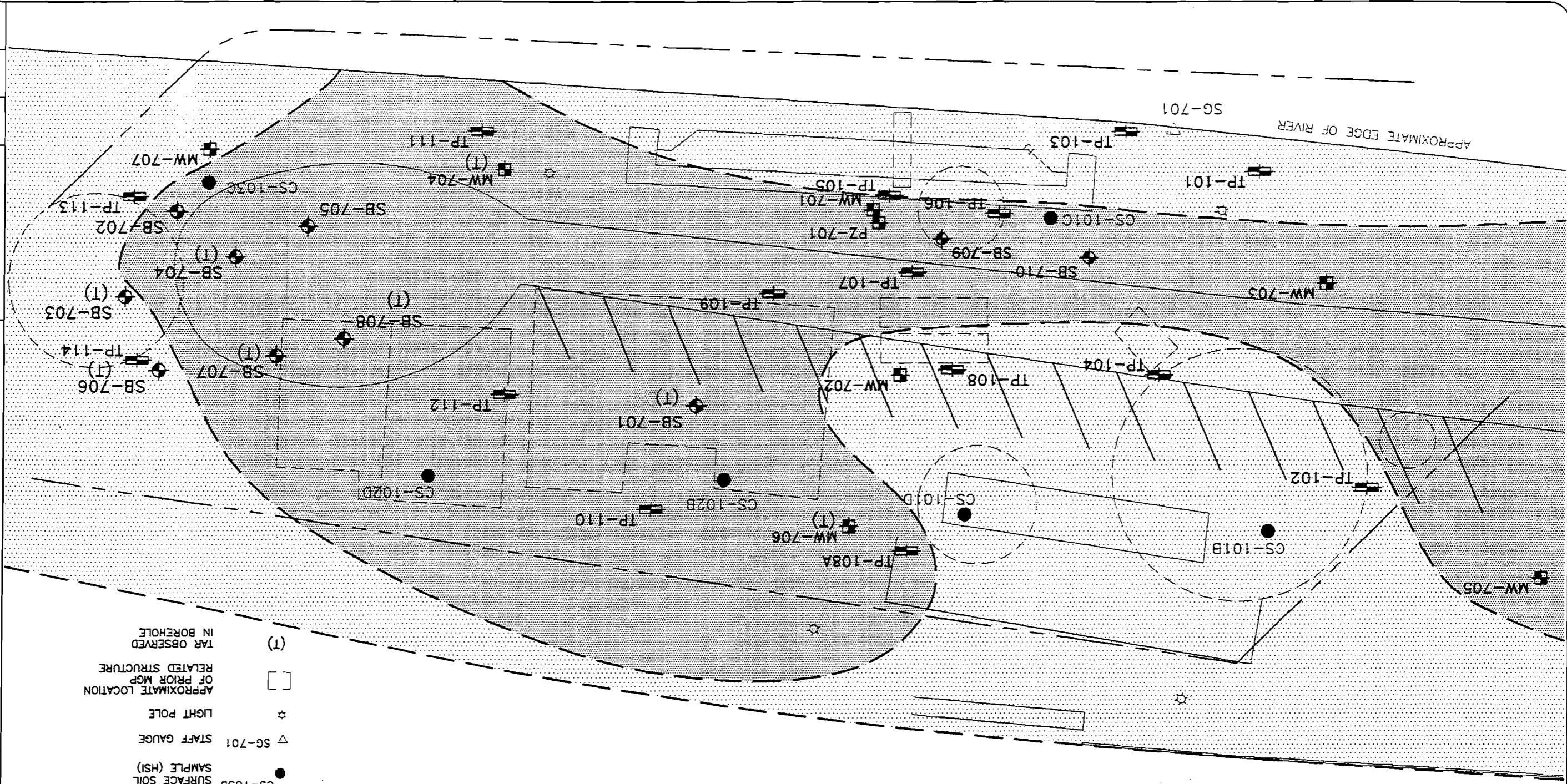
DRAWN BY:	TAS	DATE:	11/13/95
CHECKED BY:	SAG	DATE:	4/12/96
APPROVED BY:	SAG	DATE:	6/27/96
AUTOCAD FILE: 1060-B13.DWG			

**PHASE II SAMPLING LOCATIONS**  
 WPC SHEBOYGAN II  
 SHEBOYGAN, WISCONSIN



PROJECT NO.	1060/4
DRAWING NO.	1060-B13
FIGURE NO.	3-1

SOURCE NOTE:  
 1. THIS DRAWING WAS MODIFIED FROM A MAP SURVEYED BY HINZE & ASSOCIATES, INC., SHEBOYGAN, WISCONSIN, REGISTERED LAND SURVEYORS, JOB NO. D-2091, DATED SEPTEMBER 4, 1995.  
 2. PHASE I SAMPLING LOCATIONS REFERENCED FROM SIMON HYDRO-SEARCH'S 1992 "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE SHEBOYGAN, WISCONSIN", REPORT.

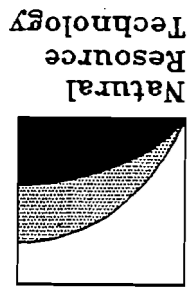


- LEGEND**
- MW-701 MONITORING WELL
  - PZ-701 PIEZOMETER
  - SB-702 SOIL BORING
  - TP-101 TEST PIT (HSI)
  - ESTIMATED EXTENT OF GENERAL FILL
  - ESTIMATED EXTENT OF GENERAL FILL WITH CINDERS
  - CS-103B SURFACE SOIL SAMPLE (HSI)
  - SG-701 STAFF GAUGE
  - ☆ LIGHT POLE
  - APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE
  - (T) TAR OBSERVED IN BOREHOLE

**FIELD OBSERVATIONS**

WPSC SHEBOYGAN II  
 SHEBOYGAN, WISCONSIN

DRAWN BY:	TAS	DATE:	11/6/95
CHECKED BY:	SAG	DATE:	4/12/96
APPROVED BY:	SAG	DATE:	6/27/96
AUTOCAD FILE: 1060-B06.DWG			



Natural Resource Technology

PROJECT NO.  
1060/4

DRAWING NO.  
1060-B06

FIGURE NO.  
4-1



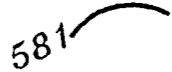









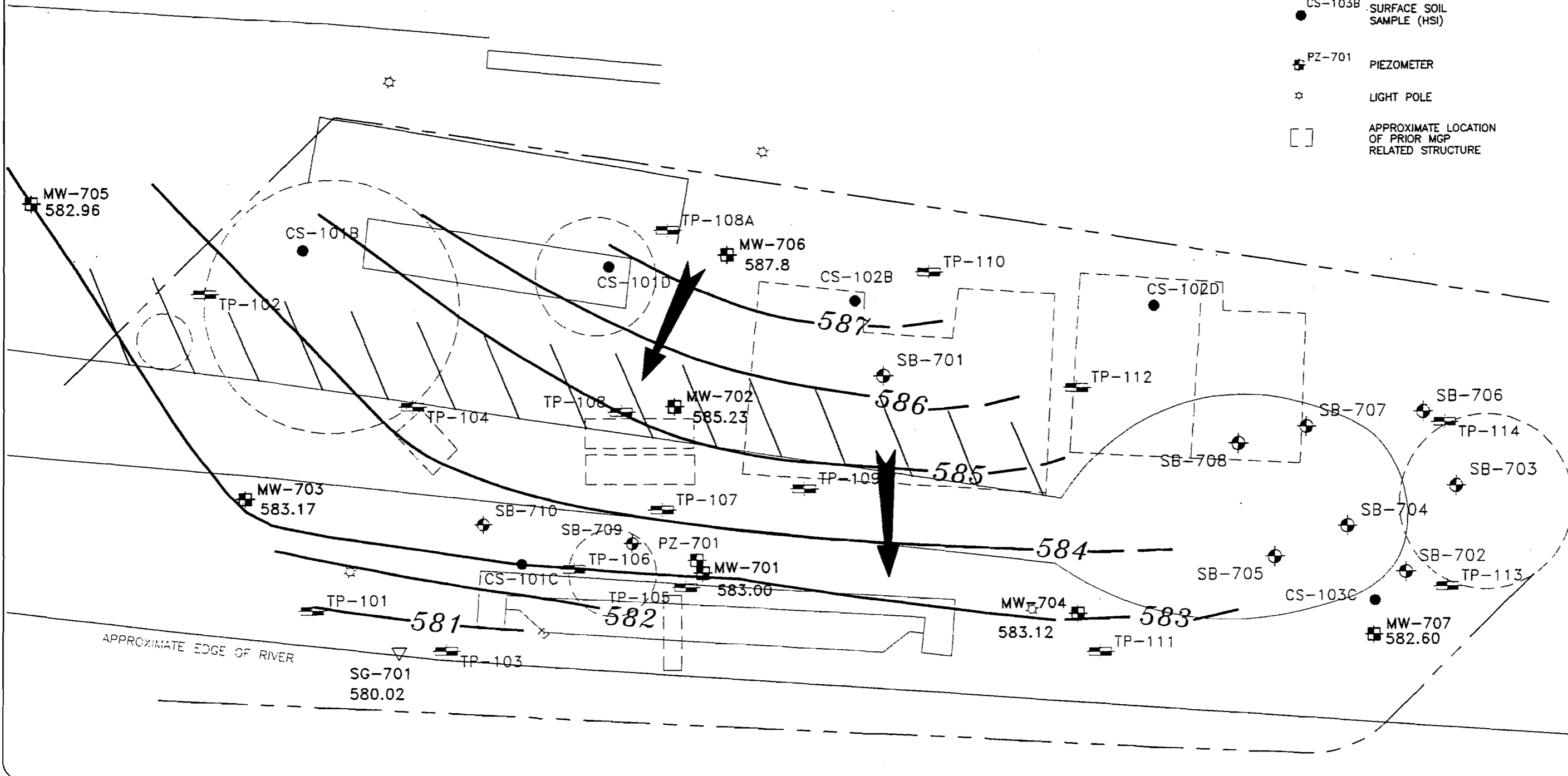
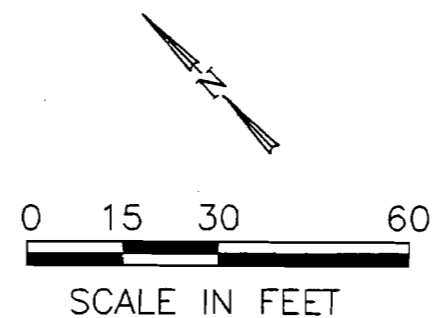
SOURCE NOTE:

1. THIS DRAWING WAS MODIFIED FROM A MAP SURVEYED BY HINZE & ASSOCIATES, INC., SHEBOYGAN, WISCONSIN, REGISTERED LAND SURVEYORS, JOB NO. D-2091, DATED SEPTEMBER 4, 1995.

2. PHASE I SAMPLING LOCATIONS REFERENCED FROM SIMON HYDRO-SEARCH'S 1992 "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE, SHEBOYGAN, WISCONSIN", REPORT.

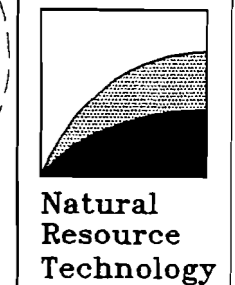
LEGEND

-  MW-701  
583.46  
MONITORING WELL AND WATER TABLE ELEVATION (MSL)
-  SG-701  
580.02  
STAFF GAUGE AND WATER SURFACE ELEVATION (MSL)
-  581  
WATER TABLE ELEVATION CONTOUR (MSL)
-  APPARENT GROUNDWATER FLOW DIRECTION
-  SB-702  
SOIL BORING
-  TP-101  
TEST PIT (HSI)
-  CS-103B  
SURFACE SOIL SAMPLE (HSI)
-  PZ-701  
PIEZOMETER
-  LIGHT POLE
-  APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE



DRAWN BY:	TAS	DATE:	10/6/95
CHECKED BY:	SAG	DATE:	4/12/96
APPROVED BY:	SAG	DATE:	6/27/96

**WATER TABLE ELEVATION CONTOURS**  
**AUGUST 14, 1995**  
 WPSC SHEBOYGAN II  
 SHEBOYGAN, WISCONSIN



PROJECT NO.	1060/4
DRAWING NO.	1060-B03
FIGURE NO.	4-2











AUTOCAD FILE: 1060-B03.DWG

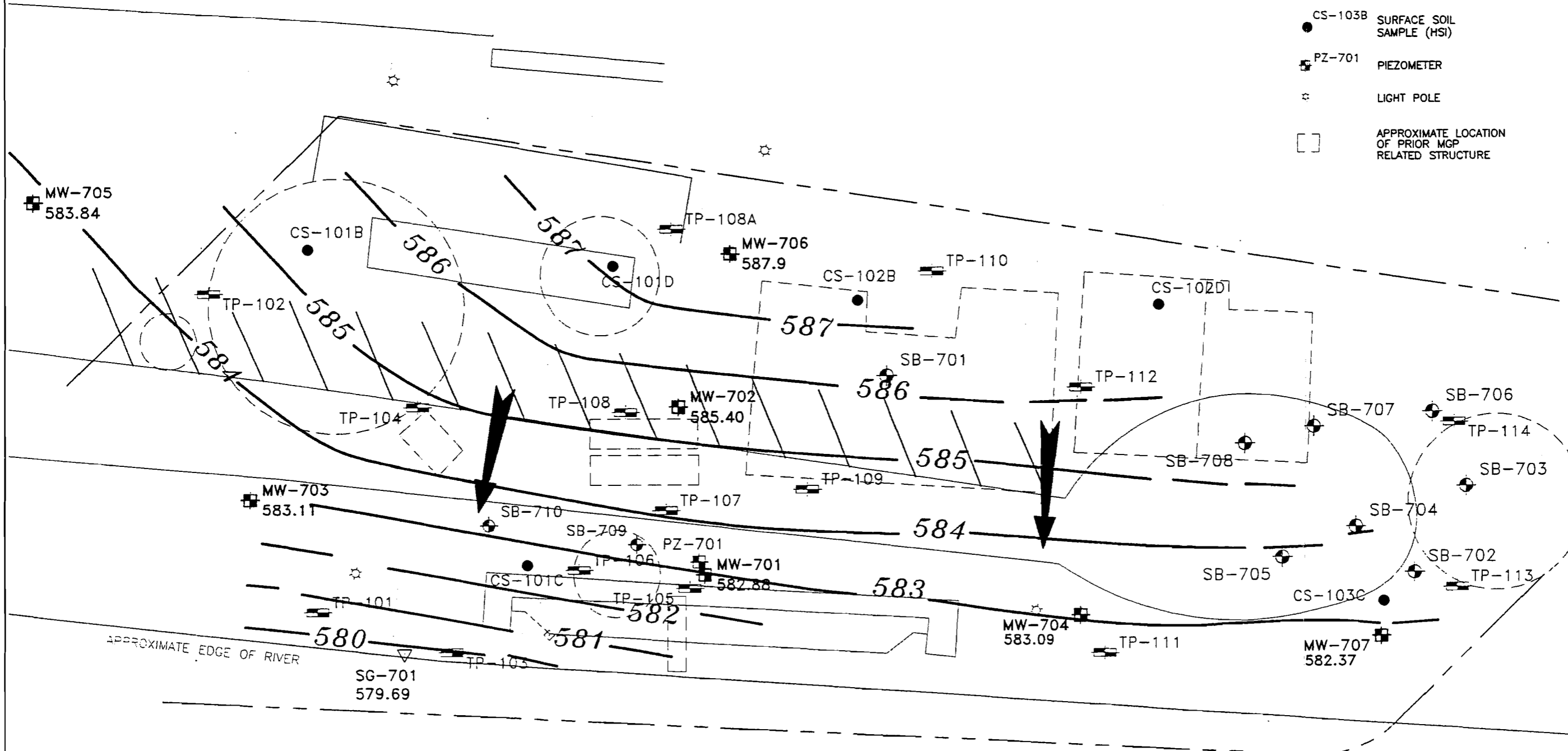
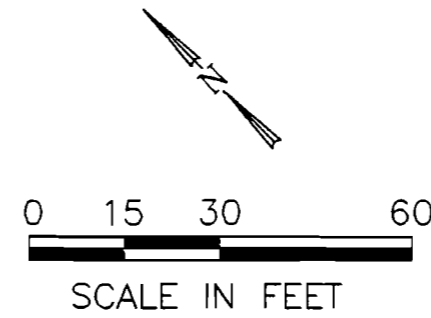
**SOURCE NOTE:**

1. THIS DRAWING WAS MODIFIED FROM A MAP SURVEYED BY HINZE & ASSOCIATES, INC., SHEBOYGAN, WISCONSIN, REGISTERED LAND SURVEYORS, JOB NO. D-2091, DATED SEPTEMBER 4, 1995.

2. PHASE I SAMPLING LOCATIONS REFERENCED FROM SIMON HYDRO-SEARCH'S 1992 "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE, SHEBOYGAN, WISCONSIN", REPORT.

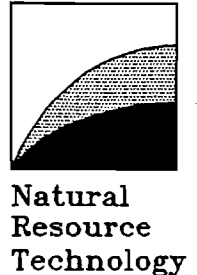
**LEGEND**

-  MW-701 583.34 MONITORING WELL AND WATER TABLE ELEVATION (MSL)
-  SG-701 579.69 STAFF GAUGE AND WATER SURFACE ELEVATION (MSL)
-  581 WATER TABLE ELEVATION CONTOUR (MSL)
-  APPARENT GROUNDWATER FLOW DIRECTION
-  SB-702 SOIL BORING
-  TP-101 TEST PIT (HSI)
-  CS-103B SURFACE SOIL SAMPLE (HSI)
-  PZ-701 PIEZOMETER
-  LIGHT POLE
-  APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE



DATE:	10/16/95
DRAWN BY:	TAS
CHECKED BY:	SAG
APPROVED BY:	SAG
AUTOCAD FILE:	1060-B05.DWG

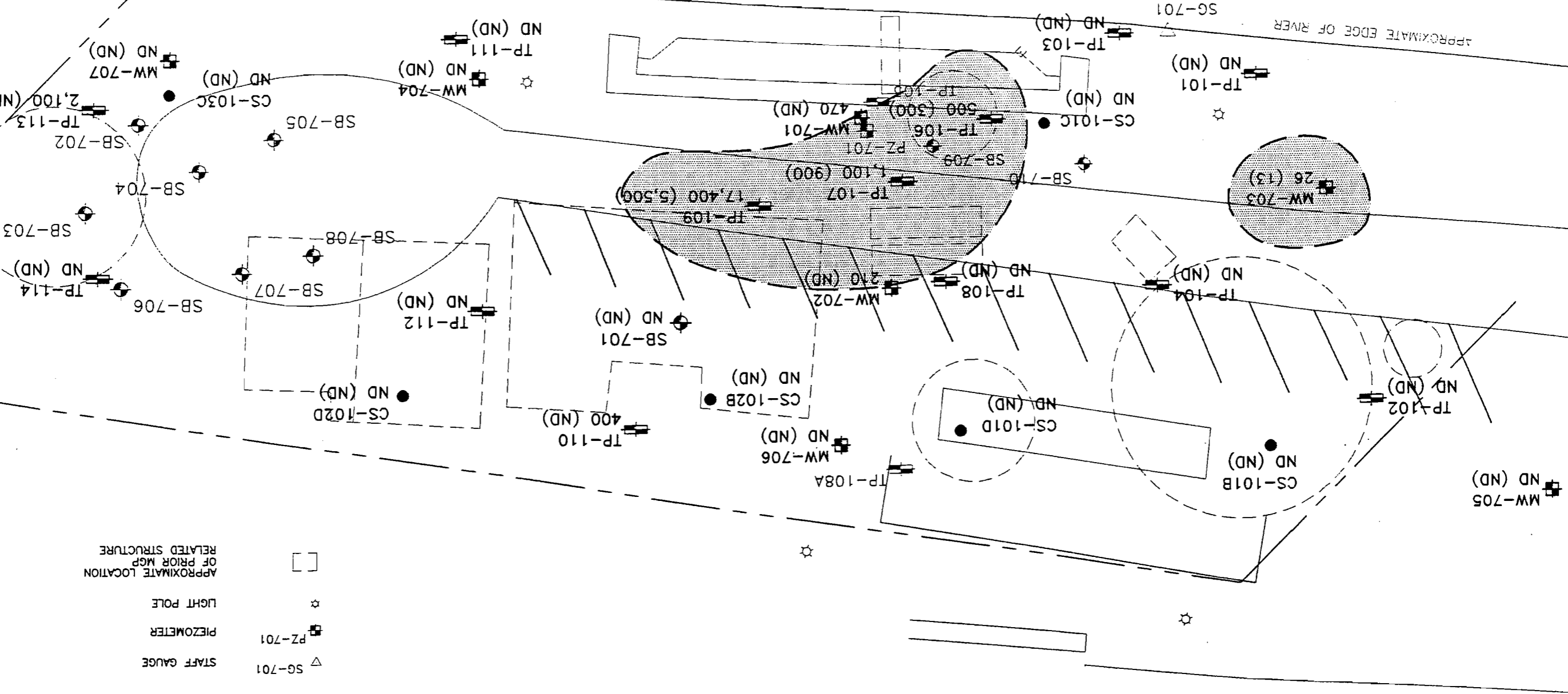
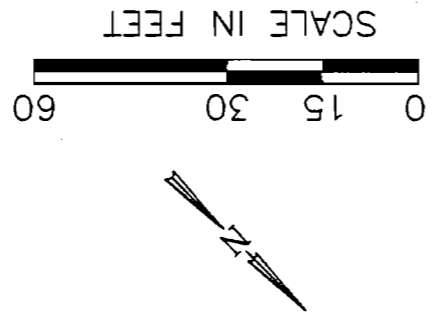
**WATER TABLE ELEVATION CONTOURS**  
**OCTOBER 20, 1995**  
 WPSC SHEBOYGAN II CAMPMARINA  
 SHEBOYGAN, WISCONSIN



PROJECT NO.	1060/4
DRAWING NO.	1060-B05
FIGURE NO.	4-3

SOURCE NOTE:  
 1. THIS DRAWING WAS MODIFIED FROM A MAP SURVEYED BY HINZE & ASSOCIATES, INC., SHEBOYGAN, WISCONSIN, REGISTERED LAND SURVEYORS, JOB NO. D-2091, DATED SEPTEMBER 4, 1995.  
 2. PHASE I SAMPLING LOCATIONS REFERENCED FROM SIMON HYDRO-SEARCH'S 1992 "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE SHEBOYGAN, WISCONSIN", REPORT.

NOTE:  
 SAMPLING LOCATIONS FOR WHICH AN ANALYTICAL SAMPLE WAS NOT COLLECTED ARE SHOWN IN GRAY.



LEGEND

MW-701	MONITORING WELL AND TOTAL BETX AND BENZENE (ug/kg)	470 (ND)
TP-101	TEST PIT (HSI) TOTAL BETX AND BENZENE (ug/kg)	ND (ND)
CS-103C	SURFACE SOIL SAMPLE (HSI) TOTAL BETX AND BENZENE (ug/kg)	ND (ND)
SB-701	SOIL BORING TOTAL BETX AND BENZENE (ug/kg)	ND (ND)
●	ESTIMATED EXTENT OF BENZENE, ETHYLBENZENE, TOLUENE, AND/OR TOTAL XYLENE	
△	STAFF GAUGE	SG-701
■	PIEZOMETER	PZ-701
*	LIGHT POLE	
□	APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE	

**TOTAL BETX AND BENZENE CONCENTRATIONS IN SOIL**  
 WPSC SHEBOYGAN II  
 SHEBOYGAN, WISCONSIN

DRAWN BY: TAS DATE: 11/7/95  
 CHECKED BY: SAG DATE: 4/12/96  
 APPROVED BY: SAG DATE: 6/27/96  
 AUTOCAD FILE: 1060-B11.DWG



Natural Resource Technology

PROJECT NO. 1060/4

DRAWING NO. 1060-B11

FIGURE NO. 4-4

**SOURCE NOTE:**










1. THIS DRAWING WAS MODIFIED FROM A MAP SURVEYED BY HINZE & ASSOCIATES, INC., SHEBOYGAN, WISCONSIN, REGISTERED LAND SURVEYORS, JOB NO. D-2091, DATED SEPTEMBER 4, 1995.

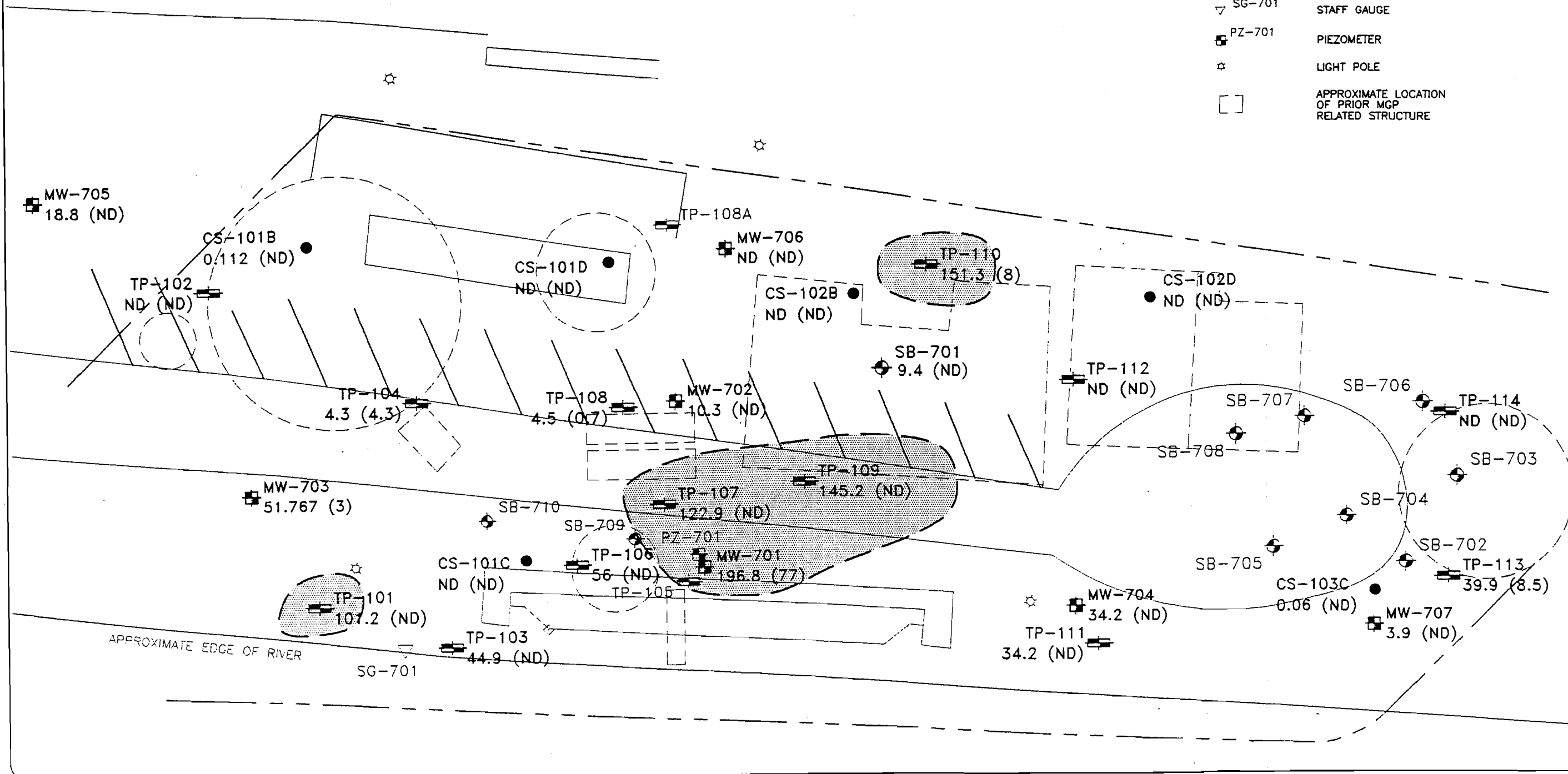
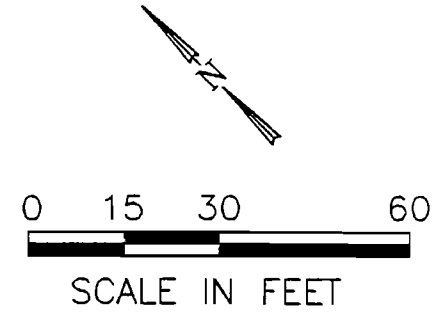
2. PHASE I SAMPLING LOCATIONS REFERENCED FROM SIMON HYDRO-SEARCH'S 1992 "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE, SHEBOYGAN, WISCONSIN", REPORT.

**NOTE:**

SAMPLING LOCATIONS FOR WHICH AN ANALYTICAL SAMPLE WAS NOT COLLECTED ARE SHOWN IN GRAY.

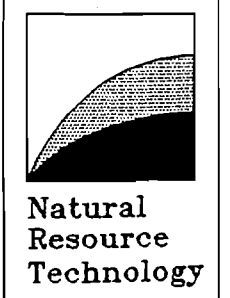
**LEGEND**

- 
**MW-701**  
**196.81 (77)** MONITORING WELL AND TOTAL PAH AND NAPHTHALENE (MG/KG)
- 
**TP-101**  
**101.2 (ND)** TEST PIT (HSI) TOTAL PAH AND NAPHTHALENE (MG/KG)
- 
**CS-103C**  
**0.065 (ND)** SURFACE SOIL SAMPLE (HSI) TOTAL PAH AND NAPHTHALENE (MG/KG)
- 
**SB-701**  
**9.393 (ND)** SOIL BORING TOTAL PAH AND NAPHTHALENE (MG/KG)
- 
 ESTIMATED EXTENT OF TOTAL PAH CONCENTRATIONS EXCEEDING 100 MG/KG
- 
**SG-701** STAFF GAUGE
- 
**PZ-701** PIEZOMETER
- 
 LIGHT POLE
- 
 APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE



DRAWN BY:	TAS	DATE:	11/6/95
CHECKED BY:	SAG	DATE:	4/12/96
APPROVED BY:	SAG	DATE:	6/27/96
AUTOCAD FILE: 1060-B10.DWG			

**TOTAL PAH AND NAPHTHALENE CONCENTRATIONS IN SOIL**  
 WPC SHEBOYGAN II  
 SHEBOYGAN, WISCONSIN



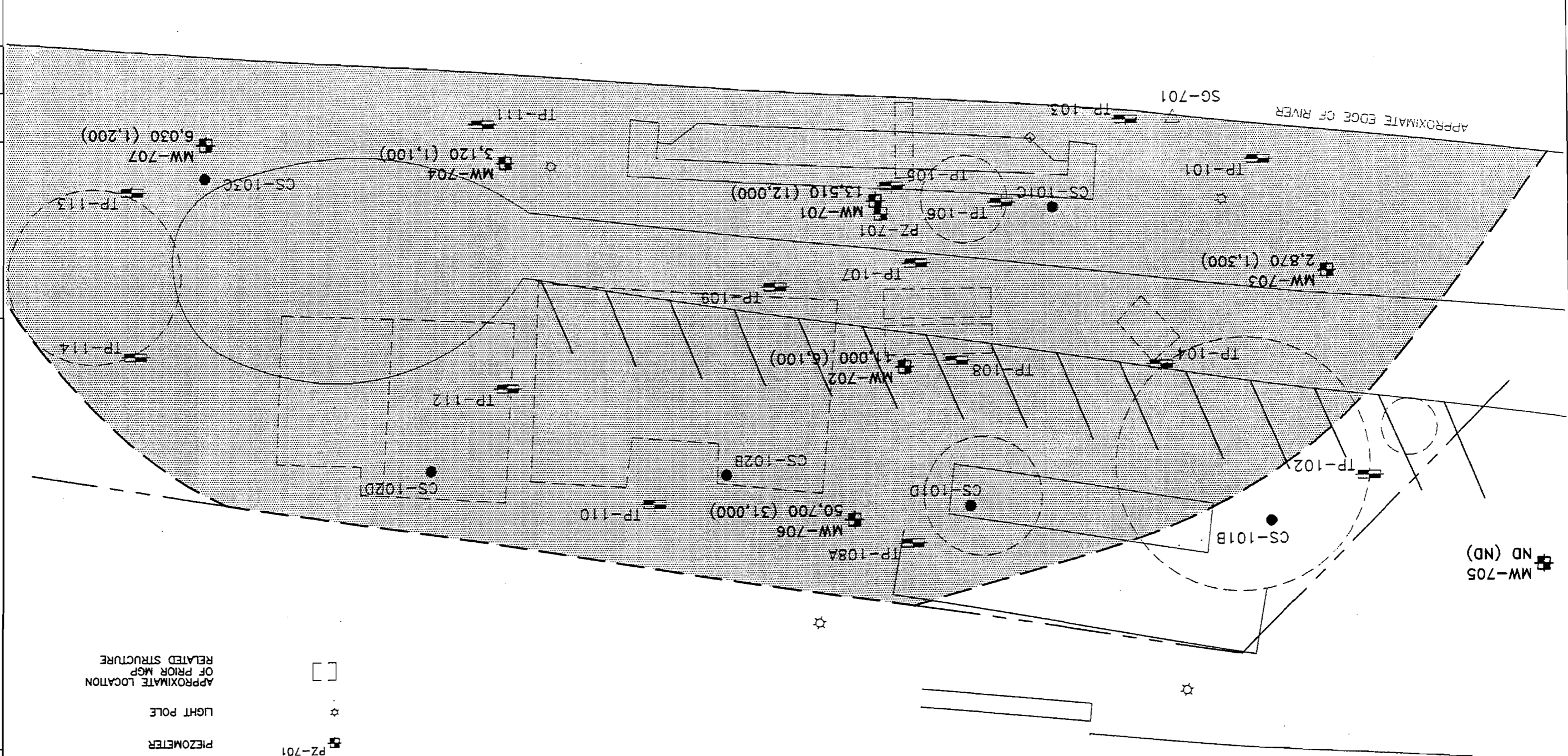
PROJECT NO.	1060/4
DRAWING NO.	1060-B10
FIGURE NO.	4-5

FIGURE NO. 4-6  
 DRAWING NO. 1060-B07  
 PROJECT NO. 1060/4  
 Natural Resource Technology

**TOTAL BETX AND BENZENE CONCENTRATIONS  
 IN GROUNDWATER SEPTEMBER 25, 1995**

WPSC SHEBOYGAN II  
 SHEBOYGAN, WISCONSIN

DRAWN BY: TAS	DATE: 11/6/95
CHECKED BY: SAG	DATE: 4/12/96
APPROVED BY: SAG	DATE: 6/27/96
AUTOCAD FILE: 1060-B07.DWG	



**LEGEND**

- MW-701 13,513 (12,000) MONITORING WELL AND TOTAL BETX AND BENZENE (UG/L)
- ESTIMATED EXTENT OF BENZENE ES EXCEEDENCE (5 UG/L)
- STAFF GAUGE SG-701
- TEST PIT (HSI) TP-101
- SURFACE SOIL SAMPLE (HSI) CS-1038
- PIEZOMETER PZ-701
- LIGHT POLE
- APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE

SCALE IN FEET  
 0 15 30 60

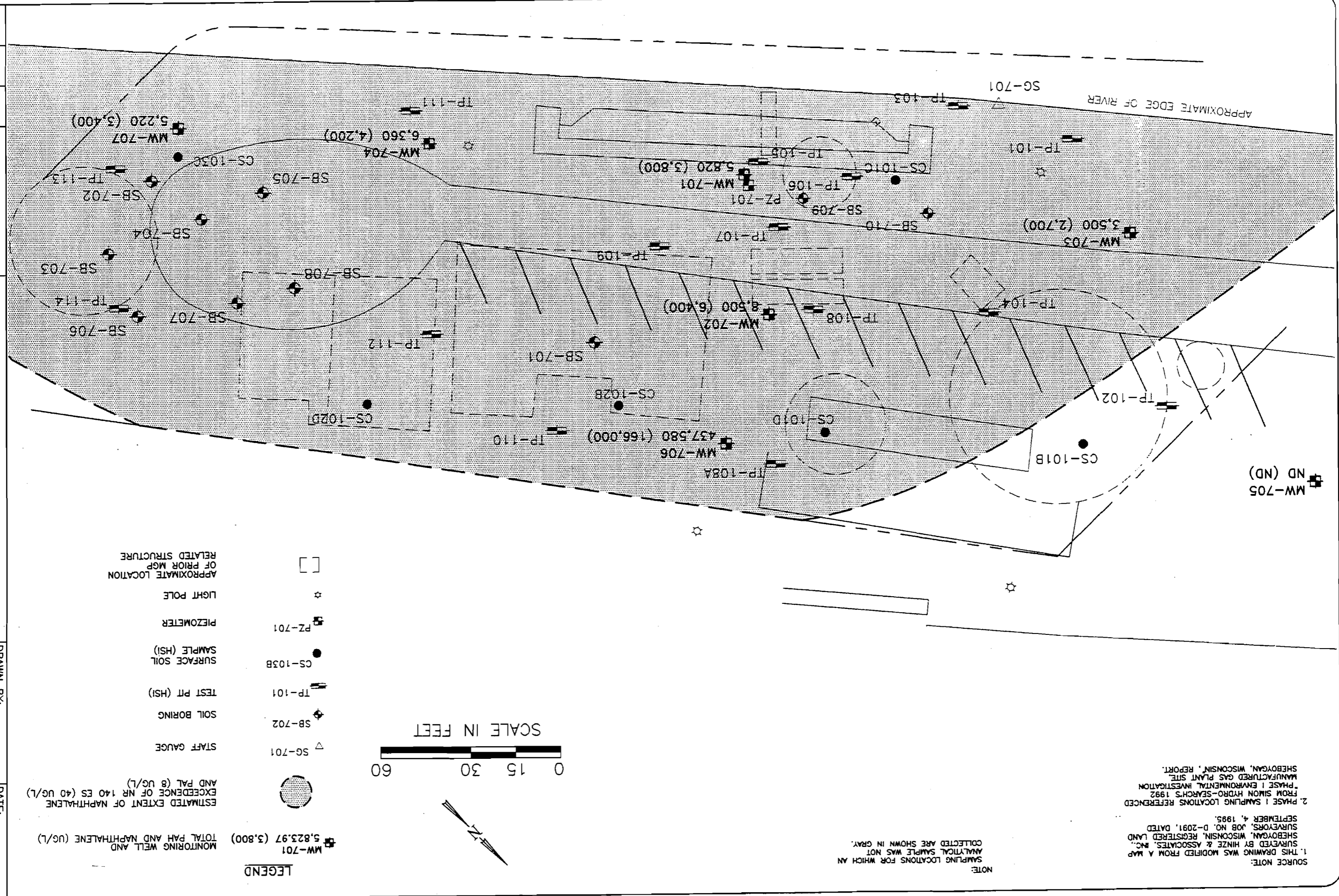
NOTE:  
 1. THIS DRAWING WAS MODIFIED FROM A MAP SURVEYED BY HINZE & ASSOCIATES, INC., SHEBOYGAN, WISCONSIN, REGISTERED LAND SURVEYORS, JOB NO. D-2091, DATED SEPTEMBER 4, 1995.  
 2. PHASE I SAMPLING LOCATIONS REFERENCED FROM SIMON HYDRO-SEARCH'S 1992 "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE, SHEBOYGAN, WISCONSIN", REPORT.



FIGURE NO. 4-7  
 DRAWING NO. 1060-B08  
 PROJECT NO. 1060/4  
 Natural Resource Technology

TOTAL PAH AND NAPHTHALENE CONCENTRATIONS  
 IN GROUNDWATER SEPTEMBER 25, 1995  
 WPSC SHEBOYGAN II  
 SHEBOYGAN, WISCONSIN

DRAWN BY: TAS  
 CHECKED BY: SAG  
 APPROVED BY: SAG  
 DATE: 11/6/95  
 DATE: 4/12/96  
 DATE: 6/27/96  
 AUTOCAD FILE: 1060-B08.DWG



**LEGEND**

MW-701 5,823.97 (3,800)  
 MONITORING WELL AND  
 TOTAL PAH AND NAPHTHALENE (UG/L)

ESTIMATED EXTENT OF NAPHTHALENE  
 AND PAL (8 UG/L)  
 EXCESS OF NR 140 ES (40 UG/L)

STAFF GAUGE SG-701

SOIL BORING SB-702

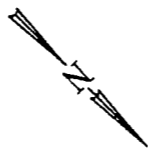
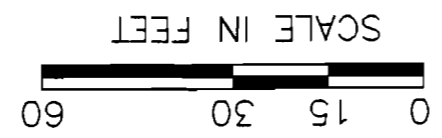
TEST PIT (HSI) TP-101

SURFACE SOIL SAMPLE (HSI) CS-103B

PIEZOMETER PZ-701

LIGHT POLE

APPROXIMATE LOCATION  
 OF PRIOR MGP  
 RELATED STRUCTURE



NOTE:  
 SAMPLING LOCATIONS FOR WHICH AN  
 ANALYTICAL SAMPLE WAS NOT  
 COLLECTED ARE SHOWN IN GRAY.

SOURCE NOTE:  
 1. THIS DRAWING WAS MODIFIED FROM A MAP  
 SURVEYED BY HINZE & ASSOCIATES, INC.  
 SHEBOYGAN, WISCONSIN, REGISTERED LAND  
 SURVEYORS, JOB NO. D-2091, DATED  
 SEPTEMBER 4, 1985.

2. PHASE I SAMPLING LOCATIONS REFERENCED  
 FROM SIMON HYDRO-SEARCH'S 1992  
 "PHASE I ENVIRONMENTAL INVESTIGATION  
 MANUFACTURED GAS PLANT SITE,  
 SHEBOYGAN, WISCONSIN", REPORT.

**SOURCE NOTE:**










1. THIS DRAWING WAS MODIFIED FROM A MAP SURVEYED BY HINZE & ASSOCIATES, INC., SHEBOYGAN, WISCONSIN, REGISTERED LAND SURVEYORS, JOB NO. D-2091, DATED SEPTEMBER 4, 1995.

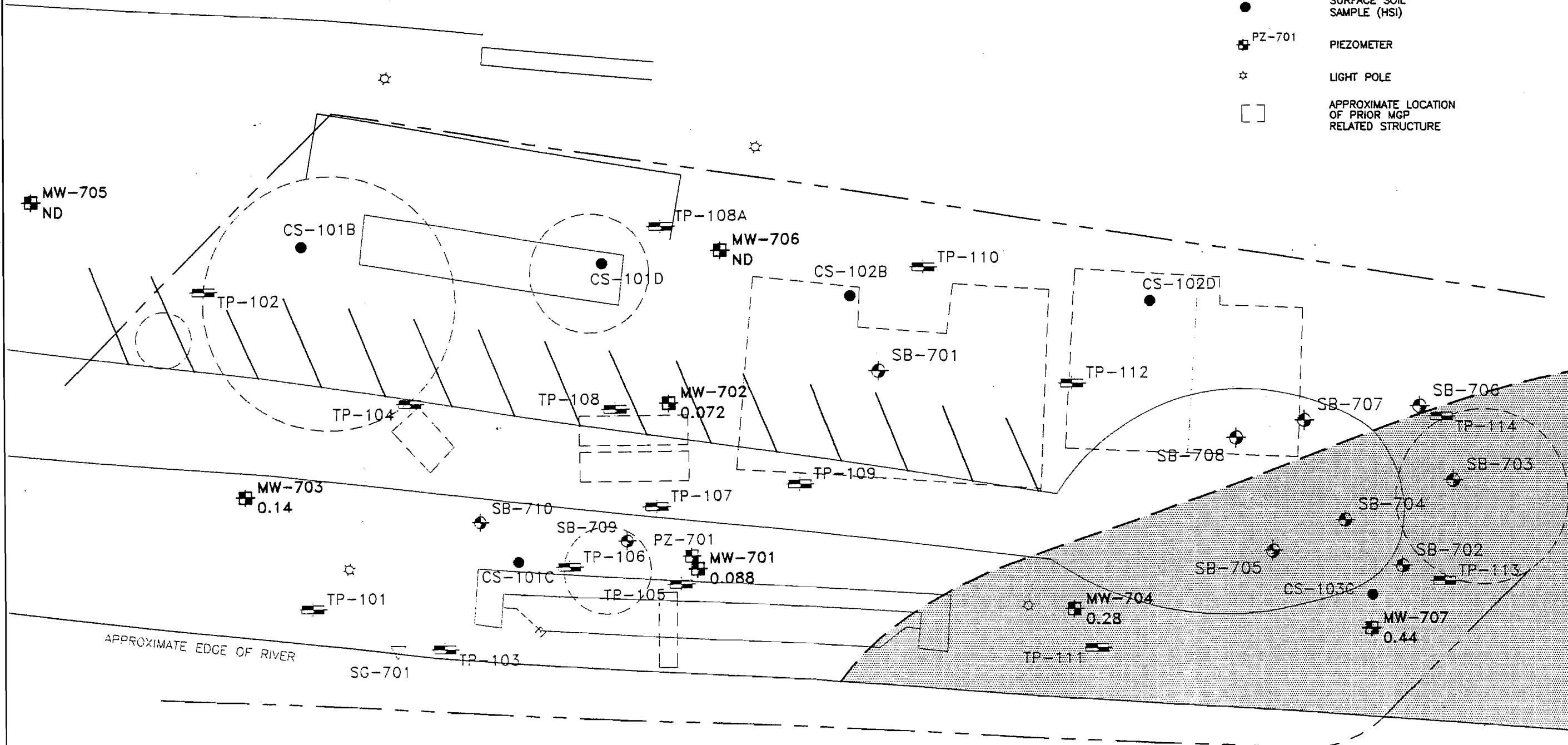
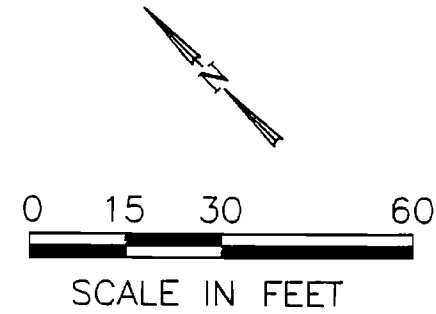
2. PHASE I SAMPLING LOCATIONS REFERENCED FROM SIMON HYDRO-SEARCH'S 1992 "PHASE I ENVIRONMENTAL INVESTIGATION MANUFACTURED GAS PLANT SITE, SHEBOYGAN, WISCONSIN", REPORT.

**NOTE:**

SAMPLING LOCATIONS FOR WHICH AN ANALYTICAL SAMPLE WAS NOT COLLECTED ARE SHOWN IN GRAY.

**LEGEND**

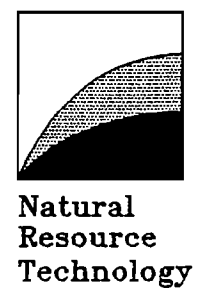
-  MW-701 0.088 MONITORING WELL AND TOTAL CYANIDE (MG/L)
-  ESTIMATED EXTENT OF TOTAL CYANIDE EXCEEDANCE OF NR 140 ES (0.2 MG/L)
-  SG-701 STAFF GAUGE
-  SB-702 SOIL BORING
-  TP-101 TEST PIT (HSI)
-  CS-103B SURFACE SOIL SAMPLE (HSI)
-  PZ-701 PIEZOMETER
-  LIGHT POLE
-  APPROXIMATE LOCATION OF PRIOR MGP RELATED STRUCTURE



DATE:	11/6/95
DATE:	4/12/96
DATE:	6/27/96

**TOTAL CYANIDE CONCENTRATIONS  
IN GROUNDWATER SEPTEMBER 25, 1995**

Wpsc SHEBOYGAN II  
SHEBOYGAN, WISCONSIN



PROJECT NO.	1060/4
DRAWING NO.	1060-B09
FIGURE NO.	4-8

AUTOCAD FILE: 1060-B09.DWG

**NRT STANDARD PRACTICES TABLE OF CONTENTS**

**APPENDIX C**



**NATURAL RESOURCE TECHNOLOGY  
STANDARD PRACTICES MANUAL**

**Section: Site Investigation  
Number: 07-TC  
Date: 02-18-94  
Revision: 0  
Page: 1 of 6**

---

Eff. Date	Initiator	Apprv'd
-----------	-----------	---------

---

**TABLE OF CONTENTS**

<u>PRACTICE TITLE</u>	<u>REFERENCE DOCUMENTS</u>
<b>07-01 POLICY STATEMENT</b> .....	1
<b>07-02 DATA MANAGEMENT</b>	
07-02-01 General .....	1
07-02-02 Field Notebooks .....	1, 2
07-02-03 Photographic Evidence .....	1, 2
07-02-04 Document Storage and Management .....	1
07-02-05 Electronic File Management .....	1
<b>07-03 SAMPLE COLLECTION - GENERAL</b>	
07-03-01 Sample Identification .....	1, 2
07-03-02 Sample Location Control .....	1, 2, 3
07-03-03 Chain of Custody .....	1, 2
07-03-04 Sample Transportation and Shipping .....	1, 2
<b>07-04 SAMPLING QUALITY CONTROL</b>	
07-04-01 General Considerations .....	1, 2
07-04-02 Data Quality Objectives .....	1, 2
07-04-03 Sample Container Preparation, Preservation and Maximum Hold Times .....	1, 2, 5
07-04-04 Quality Assurance Samples .....	1, 2
07-04-05 Equipment Decontamination .....	1, 2
<b>07-05 GENERAL MONITORING AND SITE SURVEYS</b>	
07-05-02 Well Integrity Evaluation .....	1
<b>07-06 SUBSURFACE EXPLORATION METHODS</b>	
07-06-01 Borehole and Excavation Clearance .....	1
07-06-02 Monitoring Wells-General .....	1, 2, 4, 6
07-06-03 Monitoring Wells-Drilling Methods .....	1, 2, 4, 6

**REFERENCE DOCUMENTS**

Section: Site Investigation  
 Number: 07-TC  
 Date: 02-18-94  
 Revision: 0  
 Page: 2 of 6

**PRACTICE TITLE**

**07-06 SUBSURFACE EXPLORATION METHODS (Cont'd)**

- 07-06-04 Monitoring Wells-Borehole Requirements . . . . . 1, 2, 4, 6
- 07-06-05 Monitoring Wells-Construction Methods . . . . . 1, 2, 4, 6
- 07-06-06 Monitoring Wells-Construction Materials . . . . . 1, 2, 4, 6
- 07-06-07 Well Development . . . . . 1, 2, 4, 6
- 07-06-08 Well Abandonment . . . . . 1, 2, 4, 6
- 07-06-09 Ground-Water Sample Collection with the HydroPunch . . . . . 1
- 07-06-10 Soil Investigation and Sampling by Auger Methods . . . . . ASTM D1452
- 07-06-11 Thin-walled Tube Sampling of Soils . . . . . ASTM D1587
- 07-06-12 Diamond Core Drilling for Site Investigation . . . . . ASTM D2113
- 07-06-13 Guide for Field Logging of Subsurface Explorations . . . . . of Soil and Rock . . . . . ASTM D5434

**07-07 SOIL SAMPLING AND MEASUREMENT PROCEDURES**

- 07-07-01 Soil Sample Description . . . . . 4
- 07-07-02 Soil Sampling Procedures . . . . . 1, 2
- 07-07-03 Soil Sampling for Microorganisms . . . . . 1, 2
- 07-07-04 Measuring Matrix Potential in the Vadose Zone . . . . . Using Tensiometers . . . . . ASTM D3404
- 07-07-05 Pore-Liquid Sampling from the Vadose Zone . . . . . ASTM D4696
- 07-07-06 Soil Sampling from the Vadose Zone . . . . . ASTM D4700
- 07-07-07 Guide for Comparison of Field Methods for Determining Hydraulic Conductivity in the Vadose Zone . . . . . ASTM D5126
- 07-07-08 Test Method for Infiltration Rate of Soils in Field Using Double Ring Infiltrometer . . . . . ASTM D3385
- 07-07-11 Test Method for Field Measurement of Infiltration Rate Using a Double Ring Infiltrometer with a Sealed Inner Ring . . . . . ASTM D 5093

**07-08 GROUND-WATER SAMPLING AND MEASUREMENT PROCEDURES**

- 07-08-01 Ground-Water Sampling . . . . . 1, 2, 4 (ASTM D4448), 5
- 07-08-02 Ground-Water Sampling Using Packers . . . . . 1
- 07-08-03 Ground-Water Profiling Using Dual Wall Reverse Circulation . . . . . 1, 9, 13
- 07-08-04 Private Well Sampling and Analysis . . . . . 1, 3, 5
- 07-08-05 Aquifer Testing/Baildown Tests - General . . . . . ASTM D4043

**PRACTICE TITLE**

**REFERENCE DOCUMENTS**

**07-08 GROUND-WATER SAMPLING AND MEASUREMENT PROCEDURES**

- 07-08-06 Field Procedure for Instantaneous Change in Head  
 (Slug Tests) for Determining Hydraulic Properties  
 in Aquifers . . . . . ASTM D4044
- 07-08-07 Field Procedure for Withdrawal and Injection Well Tests  
 for Determining Hydraulic Properties of Aquifer Systems . . . . . ASTM D4050
- 07-08-08 Analytical Procedure for Determining Transmissivity of  
 Nonleaky Confined Aquifers by Over-damped Well  
 Response to Instantaneous Change in Head (Slug Tests) . . . . . ASTM D4104
- 07-08-09 Analytical Procedure for Determining Transmissivity and  
 Storage Coefficient of Nonleaky Confined Aquifers by the  
 Modified Theis Nonequilibrium Method . . . . . ASTM D4105
- 07-08-10 Analytical Procedure for Determining Transmissivity and  
 Storage Coefficient of Nonleaky Confined Aquifers by the  
 Theis Nonequilibrium Method . . . . . ASTM D4106
- 07-08-11 Determining Transmissivity and Storativity of Low  
 Permeability Rocks by In-Situ Measurements Using the  
 Constant Head Injection Test . . . . . ASTM D4630
- 07-08-12 Determining Transmissivity and Storativity of Low  
 Permeability Rocks by In-Situ Measurements Using the  
 Pressure Pulse Technique . . . . . ASTM D4631
- 07-08-13 Determining Transmissivity of Nonleaky Confined Aquifers  
 by the Theis Recovery Method . . . . . ASTM D5269
- 07-08-14 Determining Transmissivity and Storage Coefficient of  
 Bounded, Nonleaky, Confined Aquifers . . . . . ASTM D5270
- 07-08-15 Test Method for Determining Specific Capacity and  
 Estimating Transmissivity at Control Well . . . . . ASTM D5472
- 07-08-16 Test Method (Analytical Procedure) for Analyzing the  
 Effects of Partial Penetration of Control Well and  
 Determining the Horizontal and Vertical Hydraulic  
 Conductivity in a Nonleaky Confined Aquifer . . . . . ASTM D5473
- 07-08-15 Ground-Water Elevation Measurement-Solonist . . . . . 17, 4 (ASTM D4750)

**07-09 SURFACE WATER/SEDIMENT SAMPLING AND  
 MEASUREMENT PROCEDURES**

- 07-09-01 Surface Water/Sediment Sampling . . . . . 1, 2
- 07-09-02 Stage Discharge Determination in Small Streams . . . . . 1, 2

---

---

**PRACTICE TITLE**

**REFERENCE DOCUMENTS**

**07-10 AIR SAMPLING PROCEDURES**

07-10-01 Soil Gas Survey - General . . . . . 1, 3, 4 (ASTM D5314)  
07-10-02 Soil Gas Survey - AMS Vapor Probe System . . . . . 1, 2, 14  
07-10-03 Headspace Screening for Volatile Organic Compounds . . . . . 7  
07-10-04 Bar Hole Survey . . . . . 1  
07-10-05 Methane Monitoring in Buildings (MSA Model 260) . . . . . 1

**07-11 WASTE SAMPLING . . . . . 1, 2**

**07-12 WASTEWATER SAMPLING AND MEASUREMENT PROCEDURES . . . . 1, 2**

**07-13 FIELD ANALYTICAL PROCEDURES**

07-13-01 Equipment Calibration, Operation and Maintenance . . . . . 1, 2  
07-13-02 Photovac PID . . . . . 11  
07-13-03 pH Meter . . . . . 12  
07-13-04 Specific Conductance Meter . . . . . 10

**07-14 FIELD PHYSICAL MEASUREMENTS**

07-14-01 Survey Control (Horizontal and Vertical) . . . . . 1, 2

**07-15 LABORATORY ANALYTICAL PROCEDURES**

07-15-01 Method for Particle Size Analysis of Soils . . . . . ASTM D422  
07-15-02 Test Method for Amount of Material in Soils Finer  
Than the No 200 (75-um) Sieve . . . . . ASTM D1140  
07-15-03 Test Method for Unconfined Compressive Strength of  
Cohesive Soil . . . . . ASTM D2166  
07-15-04 Test method for Laboratory Determination of Water  
(Moisture) Content of Soil and Rock . . . . . ASTM D2216  
07-15-05 Practice for Wet Preparation of Soil Samples for Partical  
Size Analysis and Determination of Soil Constants . . . . . ASTM D2217  
07-15-06 Test Method for Permeability of Granular Soils  
(Constant Head) . . . . . ASTM D2434  
07-15-07 Test Method for Classification of Soils for Engineering  
Purposes (Unified Soil Classification System) . . . . . ASTM D2487  
07-15-08 Practice for Description and Identification of Soils  
(Visual-Manual Procedure) . . . . . ASTM D2488

**PRACTICE TITLE**

**REFERENCE DOCUMENTS**

**07-15 LABORATORY ANALYTICAL PROCEDURES (Cont'd)**

07-15-09 Test Method for Liquid Limit, Plastic Limit and Plasticity  
 Index of Soils . . . . . ASTM D4318  
 07-15-10 Test Method for pH of Soils . . . . . ASTM D4972  
 07-15-11 Test Method for Permeability of Rocks by Flowing Air . . . . . ASTM D4525  
 07-15-12 Test Method for Measurement of Hydraulic Conductivity  
 of Saturated Porous Materials Using a Flexible Wall  
 Permeameter . . . . . ASTM D5084

**07-16 GEOPHYSICAL SURVEYS**

07-16-01 Electrical Resistivity Survey . . . . . 3  
 07-16-02 Siesmic Refraction Survey . . . . . 3

**07-17 GROUND-WATER MODELING**

07-17-01 Guide for Application of Ground-water Flow Model to  
 a Site-Specific Problem . . . . . ASTM D5447  
 07-17-02 Guide for Comparing Ground-water Flow Model  
 Simulations to Site . . . . . ASTM D5490  
 07-17-03 Quality Assurance Procedures . . . . . 3

**07-18 DATA ANALYSIS, REDUCTION AND VALIDATION**

07-18-01 Data Validation . . . . . 16

## REFERENCE DOCUMENTS

1. Natural Resource Technology, Inc., 1994.
2. Modified from: U.S.EPA Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual, February 1, 1991 (ECBSOPQAM).
3. Modified from: U.S.EPA, Performance of Remedial Response Activities at Uncontrolled Hazardous Waste Sites (REM II), U.S.EPA Contract No. 68-01-6939, 1984.
4. American Society for Testing and Materials, 1994 Annual Book of ASTM Standards, Vols. 4.08 and 4.09
5. Wisconsin Department of Natural Resources, Groundwater Sampling Procedures, Publ-WR-168 87, September 1987.
6. Wisconsin Department of Natural Resources, Chapter NR 141, W.A.C.
7. Wisconsin Department of Natural Resources, Leaking Underground Storage Tank Program, Field Screening Procedures, Publ-SW-176-92.
8. Wisconsin Department of Natural Resources, General Interim Guidelines for the Management of Investigative Wastes, January 14, 1993
9. Personal Communication, Layne-Northwest Co., Pewaukee, WI
10. Cole-Parmer Model 01481-61 Conductivity Meter Manual
11. Photovac Microtip IS-3000 User's Manual
12. Cole-Parmer Models 5996-50,60,70,80 pH Meter Instruction Manual
13. American Society for Testing and Materials, Proposed Standard Guide, W. Teasdale, February 5, 1994
14. AMS Vapor Probe Instruction Manual
15. Bouwer and Rice, 1976. "A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially

PLATE