SITE INVESTIGATION WORK PLAN
TAR SEEP AREA
Wabash Alloys Facility
Oak Creek, Wisconsin

Prepared for:

241379050
02-41-553761

Beazer

Beazer East, Inc.
One Oxford Centre
Suite 3000
Pittsburgh, PA 15219-6401

6-11-2009

Prepared by:

GeoTrans, Inc.
A TETRA TECH COMPANY

GeoTrans Inc.
175 N. Corporate Drive, Suite 100
Brookfield, WI 53045

June 4, 2009

CERTIFICATION

"I, Michael R. Noel, hereby certify that I am a scientist as that term is defined in s. NR 712.03 (3), 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."

Michael R. Noel, P.G.
Vice President, Principal Hydrogeologist

June 4, 2009
Date

"I, Mark A. Manthey, 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."

Mark A. Manthey, P.G.
Senior Hydrogeologist

June 4, 2009
Date

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Purpose

The purpose of this investigation is to evaluate the extent of subsurface tar and associated impacted soil and groundwater in the vicinity of the tar seep on the south drive at the Wabash Alloys Facility in Oak Creek, Wisconsin. The implementation of this work is contingent upon obtaining an access agreement with the current property owner.

1.2 Location and Project Information

Site Address:
Wabash Alloys
9100 South Fifth Avenue
Oak Creek, Wisconsin 53154

Site Location:
SW ¼ of the NW ¼, and the NW ¼ of the SW ¼
Section 24, T5N, R22E
Milwaukee County

Potentially Responsible Parties:
Current Site Owner:
Wabash Alloys LLC/Connell Properties
Contact: John Curtin

Former Site Owner:
Vulcan Materials
Contact: Tom McElligott
414-277-5531 (phone)

Former Site Owner:
Beazer East, Inc.
Contact: Mike Tischuk
412-208-8809 (phone)

Environmental Consultant:
Mike Noel, P.G.
GeoTrans, Inc.
175 N Corporate Drive
Brookfield, WI 53045
262-792-1282 (phone)
262-792-1310 (fax)

2.0 SITE BACKGROUND

The Wabash Alloys site is located at 9100 South Fifth Avenue in Oak Creek, Wisconsin (Figure 1).

2.1 Site History

The site is located in an industrial area that has been used for manufacturing various products since the early 1900's. The chronology of site ownership and site use are provided below:

- 1917-1935 – American Tar Products – coal tar distillation;
- 1935-1960 – Koppers Tar Plant – coal tar distillation;
- 1960-1968 – Arthur A. Levin and Saul Padek – coal tar distillation, chemical manufacturing;
- 1968-1987 – Vulcan Materials – secondary aluminum smelting;
- 1987-2001 – Wabash Alloys – secondary aluminum smelting;
- 2001-present –Wabash Alloys/Connell Limited Partnership – discontinued operations

The site occupies approximately 21 acres of land. Approximately 12 acres form the western part of the site that includes the former smelting facility structures. The remaining eastern portion of the property contains no structures except for remaining segments of rail spurs.

The structures related to the coal tar distillation plant were apparently removed during the Levin & Padek ownership period as only a few dilapidated structures remained when Vulcan purchased the property in 1968 and constructed the aluminum smelting plant. In the process of Vulcan's smelter construction activities, oily soil was excavated from the site and disposed of at an off-site landfill located at 3655 East American Avenue in Oak Creek.

The structures related to the discontinued smelting facility remain at the site and are comprised of four contiguous buildings from west to east: 1) maintenance, office and ingot storage 2) furnace room, 3) material handling room and 4) scrap storage room. A separate wastewater treatment building is located behind (east) these buildings.

2.2 Geology & Hydrogeology

2.2.1 Regional Setting

Native unconsolidated deposits in the vicinity of the site are comprised of glacial till, glaciolacustrine, and glacial outwash deposits of the Oak Creek Till. The total thickness of the unconsolidated deposits in the area varies from 100 to 200 feet, based on well logs from area wells. The uppermost bedrock unit is the Niagara Dolomite. Regional groundwater flow is to the east toward Lake Michigan.

2.2.2 Site Conditions

Borings installed at the site in the vicinity of the underground storage tank (UST) areas indicate the native geology of the upper 20 feet (depth of investigation) is comprised of clayey silt to silty clay with silts and sands.

Groundwater has been observed in site wells at very shallow depths of 1 to 7 feet below ground surface (bgs). Previous investigations have observed a groundwater flow direction to the south or southeast. Hydraulic conductivity estimates range from 4.24×10^{-4} to 5.14×10^{-6} cm/sec with a geometric mean of 5.44×10^{-5} cm/sec based on bail-recovery tests conducted on 5 monitor wells. Based on a hydraulic gradient of 0.027 and an effective porosity of 15 percent for fractured clay, the linear groundwater flow velocity is estimated at approximately 10 ft/yr.

2.3 Previous Site Investigations and Remedial Actions

The following is a chronological summary of the previous site investigation and remedial activities conducted at the site.

- 1968 – Vulcan had excavation work done in preparation for building the smelter plant. Oily soil that was removed was placed in an off-site landfill located at 3655 American Avenue.
- 1980 – Vulcan installed a clay dam keyed into natural clay to prevent downhill seepage from a pond containing tar. The pond was drained and backfilled with compacted clay. A marshy swale was sealed with 1 to 2 feet of compacted clay to provide a sealed water course across this area to the city storm sewer.
- 1984 – WDNR performed a preliminary assessment (PA) of the site.
- 1985 – Vulcan reported a PCB leak from a transformer. This was subsequently cleaned up through soil excavation.
- 1989 – EPA conducted a screening site inspection that included 6 subsurface soil samples (3 to 6 feet deep) in a saturated depression area on the east part of the site. These samples were collected in the area of the former pond and the samples were collected from a depth below the cap installed in 1980. Aromatics, phenols and polynuclear aromatic hydrocarbons (PAHs) were detected. The report concluded that there was a low potential for contaminant migration to groundwater or direct contact with the contaminants.
- 1990 – Wabash Alloys removed two USTs (1,000 gal gasoline and 1,000 gal diesel) from the north side of the property.
- 1991 –Sigma Environmental, on behalf of Wabash Alloys, conducted an investigation of the UST area including 7 soil borings and converting 3 to monitoring wells. Aromatic and PAH compounds were detected above NR 140 enforcement standards (ESs).
- 1992 – RMT, on behalf of Wabash Alloys, conducted further investigation of the UST area including 5 soil borings/monitoring wells. The results indicated that the extent of impacts associated with the UST were of limited extent (40 feet by 60 feet by 10 feet deep) and could be best remedied by excavation.

- 1993 – RMT, on behalf of Wabash Alloys, prepared a remedial action plan that evaluated options and recommended soil excavation as the preferred remedy with post-excavation monitoring of groundwater.
- 1993 – RMT, on behalf of Wabash Alloys, conducted 9 backhoe test pits to refine pre-excavation limits of impacted soils and to characterize soils for landfill disposal.
- 1993 – RMT, on behalf of Wabash Alloys, removed 1,875 tons of impacted soil for off-site landfill disposal and 440 gallons of water for off-site recycling. Post-excavation groundwater monitoring was implemented.
- 1995 – RMT, on behalf of Wabash Alloys, sampled 4 post-excavation wells for volatile organic compounds (VOCs), PAHs, diesel range organics (DRO), and gasoline range organics (GRO). No groundwater exceedances except one PAH compound which was attributed to sample turbidity.
- 1996 – RMT, on behalf of Wabash Alloys, implemented corrective actions in response to the discovery of a black substance on two of three catch basins on the storm sewer line that drains the east area behind the buildings. The corrective actions included removal of a portion of a railway spur, using the soil from beneath the spur to regrade the land surface and promote sheet flow to the lowermost catch basin, and abandoning the two upper catch basins and interconnected culverts between the two by plugging with flowable fill.
- 1998 – RMT submitted a closure request for the UST area on behalf of Wabash Alloys and includes annual groundwater sampling results (1995-1997) from 4 wells. No VOCs or GRO were detected in the groundwater samples. Low levels of DRO were detected. One PAH compound (benzo (a) pyrene) was detected sporadically above the NR140 Enforcement Standard (ES).
- 1999 – WDNR granted closure of the two 1,000-gallon USTs area.
- 1999 – RMT, on behalf of Wabash Alloys, abandons all remaining monitoring wells as a condition of closure.
- 2002 – BT2, on behalf of Wabash Alloys, removed one 10,000 gallon diesel UST and associated product piping and pump from the north side of the property, east of the previous UST area. Soil samples from excavation sidewalls and test pits indicated DRO, PVOC and PAH concentrations above NR 720 RCLs.
- 2003 – BT2, on behalf of Wabash Alloys, conducted a site investigation that included installing 6 Geoprobe® boreholes and 6 monitoring wells. Soil samples indicated DRO, PVOC and PAH concentrations above NR 720 RCLs. Groundwater samples indicated PAH concentrations above NR140 ESs. A limited soil investigation was planned to remove petroleum-related impacts but not background PAH impacts attributed to non-petroleum UST operations in the past.
- 2004 – RMT, on behalf of Wabash Alloys, excavated the soils in the vicinity of the UST to an average depth of 4.5 feet below ground surface.
- 2006 – ENSR/AECOM, on behalf of K2 Capital, conducted soil sampling at the site. Limited results were included in a Site Assessment Grant (SAG) application submitted by the City of Oak Creek. PAH compounds were detected at two sample locations (one in the east area which has been capped and one at the former 10,000-gallon UST area which has been granted closure) at concentrations above NR 720 RCLs. Photographs in the SAG application showed a couple of small areas of tar that had breached the asphalt and pooled (approximately 1-2 feet in diameter) on the asphalt surface.

- 2007 – WDNR granted closure of the one 10,000-gallon UST area.

In summary the UST areas (two 1,000-gallon USTs and one 10,000-gallon UST) at the north end of the site have been investigated, remediated and granted closure (1999 and 2007). The PCB spill at the former transformer was cleaned up (1985). The former pond in the east area has been drained and capped and a clay cutoff wall installed (1980). Catch basins and culverts in the area were sealed and the surface regraded to promote overland flow (1996). The remaining area of concern is the tar seep in the south driveway and will be the focus of this investigation.

3.0 FIELD INVESTIGATION

The scope of work presented below will be implemented to determine the nature and extent of tar observed seeping through the pavement on the south driveway at the facility. The field investigation activities will be performed by GeoTrans personnel and a drilling/Geoprobe® subcontractor. Soil samples will be collected from up to 16 soil borings to delineate the extent of soil impacts. Three of the soil borings will then be completed as water table monitor wells to determine whether the tar has impacted the groundwater.

3.1 Soil Investigation

Two small pools of tar (approximately 1 to 2 feet in diameter) were found on the south driveway of the facility in 2006. Twelve to 16 soil borings will be installed in the vicinity of the pooled tar in the area outlined on Figure 2. The northern boundary of the investigation area is the outside walls of the former secondary aluminum smelter buildings. No investigation activities inside the buildings are proposed at this time as the buildings are not being maintained and it is not known if the buildings are safe to enter. The southern boundary of the investigation area is the southern property line of the facility. The eastern and western extent of the investigation area is approximately 100 feet east and 100 feet west of the pooled tar area.

In order to delineate the degree and extent of soil impacts associated with the pooled tar, 3 soil borings will be installed and sampled around each tar pool approximately 20 feet from the tar pools. Additional soil borings will be installed and sampled to the north, south, east, and west of the initial set of soil borings until the limits of the investigation area are reached. The spacing of the additional soil borings will be between 30 and 50 feet.

Soil samples will be collected using a Geoprobe® direct push soil core sampler (Appendix A). Continuous soil samples will be collected to a depth of approximately 10 feet bgs. The soil samples will be logged by a GeoTrans environmental technician according to the United Soil Classification System. Observations of tar staining and odor will be noted. Soil samples will be screened for the presence of ionizable VOCs at 2-foot intervals using a photoionization detector (PID) equipped with a 10.6 eV lamp. The soil samples collected for PID screening will be placed in 16-ounce glass canning jars. The jars will be half-filled with soil and the top of each jar will be sealed with aluminum foil and a canning jar screw-on metal retaining ring. The headspace in the jars will be allowed to equilibrate for a minimum of 10 minutes at an ambient temperature of at least 55 degrees Fahrenheit to allow any organic compounds to off-gas. The headspace of the container will then be measured for VOCs using the PID following GeoTrans' field PID measurement procedures (Appendix A). The PID screening results will be recorded on GeoTrans field PID data sheets. The PID will be calibrated at the start of each work day by the GeoTrans environmental technician. The PID will be calibrated in accordance with manufacturer's calibration procedures using 100 parts per million isobutylene calibration gas. The PID calibration results will be recorded on a GeoTrans equipment calibration record form.

Unless visibly stained with tar, one soil sample from the 1 to 4 feet bgs sampling interval and one soil sample from the 5 to 10 feet bgs sampling interval will be submitted for laboratory analyses of petroleum VOCs (PVOCs) by EPA Method 8260 and PAHs by EPA Method 8270.

The typical detection limit for PVOCs analysis is 25 ug/kg and typical detection limits for PAHs analysis range from 1.0 to 10.0 ug/kg. The soil sample from the 5 to 10 feet bgs sampling interval will be taken from 1 foot above the water table, if the top of the water table is below 6 feet bgs, or from 5 feet bgs, if it is determined the top of the water table is shallower than 5 feet bgs. As stated above, previous site investigation work conducted on the property indicates the water table is at a shallow depth of 1 to 7 feet bgs. The soil samples will be collected in sample containers provided by the laboratory subcontractor. The soil samples submitted for PVOCs analysis will be preserved in the field with methanol provided by the laboratory subcontractor and will consist of approximately 25 grams of soil. The soil samples will be stored at a temperature of approximately 4 degrees Celsius and will be delivered to the laboratory following standard chain-of-custody procedures. Each sample container will have a self-adhesive label attached to it with the sample identification and date and time the sample was collected written on the label. The sample identification will consist of the borehole identification and sample depth. A methanol blank consisting of a sample container in which methanol is poured into will also be prepared in the field and will be submitted for laboratory analyses of PVOCs for quality assurance/quality control (QA/QC) purposes.

The locations and elevations of the soil borings will be surveyed by a state licensed surveyor so they can be accurately placed on the site base map. The soil borings that are not completed as monitor wells will be decommissioned in accordance with the procedures outlined in Chapter NR141 of the Wisconsin Administrative Code (WAC). WDNR borehole abandonment forms will be completed for each abandoned soil boring. Copies of the borehole abandonment forms will be included in an appendix of the site investigation report.

WDNR soil boring log information forms will be completed by GeoTrans personnel for each soil boring. Copies of the WDNR soil boring logs will be included in an appendix of the site investigation report.

3.2 Groundwater Investigation

Three of the soil borings will be completed as water table monitor wells to document the hydrogeologic conditions and groundwater quality in the study area. One of the monitor wells will be installed in one of the soil borings located within 20 feet of the tar pools, the second monitor well will be installed in one of the soil borings located 50 to 100 feet east of the tar pools, and the third monitor well will be located in one of the soil borings located 50 to 100 feet south of the tar pools. The hollow stem auger method of drilling will be used to drill the boreholes in which the monitor wells will be installed so the borehole diameter complies with Chapter NR141 WAC requirements. The monitor wells will be constructed of 2-inch nominal diameter schedule 40 PVC well casing and screen. The screen will have a slot size of 0.010-inches and a nominal length of 10 feet. The monitor wells will be completed with flush mounted protective covers as they will be located within the asphalt driveway of the facility. The flush mounted protective covers will comply with the specifications listed in NR141.13(4) WAC.

Previous site investigation work conducted at the facility indicates the water table occurs at a depth of 1 to 7 feet bgs; therefore, a variance to the sealing requirements specified in NR141.13

WAC is requested in order to place the well screens as close to the top of the water table as practical. The proposed well construction details are listed below:

Item	Bottom (feet bgs)	Top (feet bgs)	Length (feet)
Well Screen	13.0	3.0	10
Filter Pack	13.5	2.5	11
Annular Space Seal (Granular Bentonite)	2.5	1.0	1.5
Ground Surface Seal (Concrete)	1.0	0.0	1.0

The locations, ground surface elevation, top of protective cover elevation, and top of well casing elevation of the monitor wells will be surveyed by a licensed surveyor in accordance with the specifications listed in NR141.065(2) WAC. WDNR monitoring well construction summary forms will be completed for each monitor well and will be included in an appendix of the site investigation report.

The monitor wells will be developed by GeoTrans personnel in accordance with the procedures described in NR141.21 WAC. PVC bailers will be used to surge and purge the monitor wells during development. If a monitor well does not bail dry, a portable submersible pump may be used to complete the development the well. GeoTrans personnel will complete WDNR monitoring well development forms for each monitor well. The monitoring well development forms will be included in an appendix of the site investigation report.

Groundwater samples will be collected from the monitor wells after development of the wells is completed. The groundwater sampling round will be scheduled to occur a minimum of one week after the development of the monitor wells is completed to allow the zone disturbed during the drilling and development procedures to return to natural conditions. The groundwater samples will be submitted for laboratory analyses of PVOCs by EPA Method 8260 and PAHs by EPA Method 8270. Sample containers provided by the laboratory subcontractor will be used to collect the groundwater samples. One duplicate groundwater sample will be collected from one of the monitor wells for QA/QC purposes. The duplicate sample will also be submitted for laboratory analyses of PVOCs and PAHs. The groundwater samples will be stored at a temperature of approximately 4 degrees Celsius and will be delivered to the laboratory following standard chain-of-custody procedures. Each sample container will have a self-adhesive label attached to it with the sample identification and date and time the sample was collected written on the label. The sample identification will consist of the monitor well identification.

Because fine-grained sediment in groundwater samples can result in "false positive" detections of PAHs, the low-flow purging and sampling method will be used to collect the groundwater samples from the monitor wells as the low-flow method is intended to prevent producing fines during the sampling process. A peristaltic pump and dedicated polyethylene sample tubing will be used to collect the groundwater samples. A description of the low-flow purging and sampling method is provided in Appendix A.

Depth to groundwater measurements will be collected from the monitor wells in conjunction with the groundwater sampling round. An electronic water level meter will be used to measure the water levels in the monitor wells to the nearest 0.01 foot. The water level measurements will

be used to document the horizontal gradient and groundwater flow direction across the study area.

4.0 DECONTAMINANTION AND INVESITGATIVE WASTE HANDLING PROCEDURES

The downhole sampling equipment used to collect the soil samples will be decontaminated between samples using a solution of the trisodium phosphate (TSP) and potable water. A stiff bristle brush will be used to remove soil particles from the sampling equipment. The equipment will then be rinsed with potable water.

The bailers and portable pumps used to develop the monitor wells will be decontaminated between wells using a solution of TSP and potable water. The inner and outer surfaces of the bailers will be rinsed with the TSP and water solution. The bailers will then be rinsed with distilled water and dried before being used to develop another monitor well. If a portable pump is used to develop the wells, the pump will be decontaminated between wells by operating the pumping for several minutes in a 5-gallon bucket containing a solution of TSP and potable water. The pump will then be operated for several minutes in a 5-gallon bucket containing clean potable water and then rinsed with distilled water. The pump will be allowed to dry before being used in another monitor well.

The drilling/Geoprobe® subcontractor will be instructed to provide clean hollow stem augers for the drilling of the boreholes in which the monitor wells will be installed. The hollow stem augers used during the investigation will be cleaned using a pressure washer or a steam cleaner.

The soil cuttings produced during the installation of the soil borings and monitor wells will be contained in 55-gallon drums and temporarily stored on-site pending determination of appropriate disposal options for the soil. The drums will be labeled as containing soil cuttings. The date the soil cuttings were generated and the borehole identification from which the soil cuttings were collected will also be included on the drum labels. The analytical results from the soil investigation will be used to determine appropriate disposal options for the soil cuttings. If it is determined the drummed soil needs to be taken off-site for disposal, samples of the drummed soil would be collected and submitted for waste profile analysis.

Groundwater produced during the development and sampling of the monitor wells will be contained pending receipt of the analytical results from the groundwater sampling round. The vessels containing the groundwater will be labeled as containing groundwater. The monitor well identification from which the groundwater was purged and the date(s) the groundwater was purged from the monitor wells will also be noted on the labels. The analytical results from the groundwater sampling round will be used to determine appropriate disposal options for the contained groundwater. Additional sampling of the groundwater may be performed if it is determined that the contained groundwater needs to be disposed of off-site.

5.0 REPORT

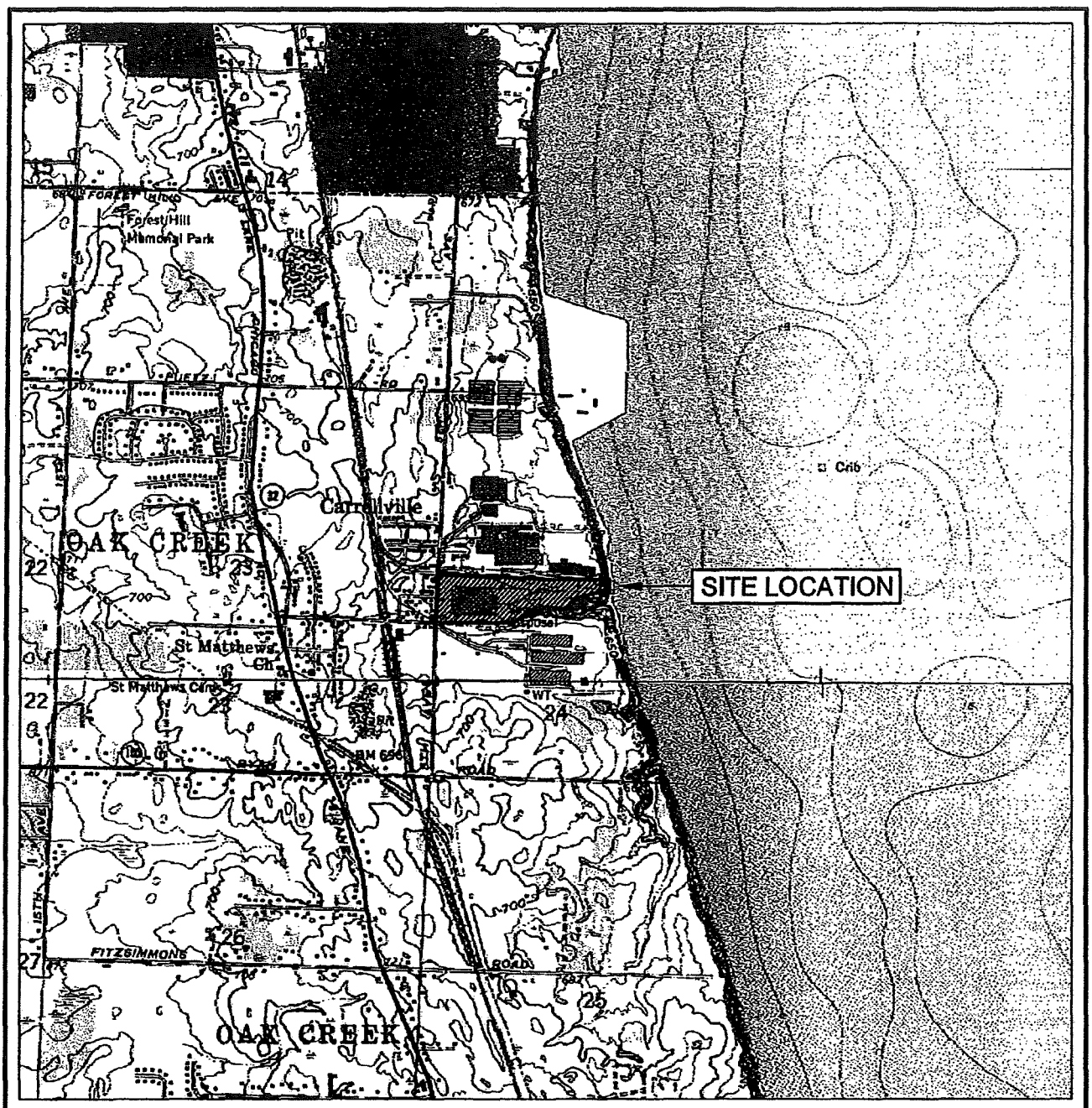
Once all the tasks described above are completed, and if GeoTrans determines that soil and groundwater impacts have been adequately defined, a site investigation report in compliance with the requirements of Chapter NR716 WAC will be prepared by GeoTrans personnel presenting the findings of the site investigation. The report will include copies of the WDNR soil boring logs, monitor well construction summary forms, and monitor well development forms for the soil borings and monitor wells installed as part of this scope of work and copies of the soil and groundwater analytical results. Tables summarizing the soil and groundwater analytical results and figures showing the locations of the soil borings and monitor wells will also be included in the report. If it is determined that the soil or groundwater impacts have not been adequately defined, recommendations to implement another phase of site investigation work to address the data gaps will be prepared.

6.0 PROJECT SCHEDULE AND HEALTH AND SAFETY PLAN

Once the WDNR has approved the work plan, Beazer East, Inc. will request access from the current property owner to perform the work plan. Fieldwork will be scheduled once the work plan is approved by the WDNR and access from the current site owner is obtained. The start date will be dependent on the availability of the drilling/Geoprobe® subcontractor, but it is anticipated the field investigation would begin within 2 weeks of obtaining site access. The soil investigation and installation and development of the monitor wells should take one week to complete. As described above, the sampling of the monitor wells will be scheduled to take place at least one week after development of the monitor wells is completed.

GeoTrans personnel have prepared a health and safety plan. A copy of the health and safety plan is included as Appendix B.

FIGURES



National Geodetic Vertical Datum of 1929
Contour Interval 10 Feet

SCALE
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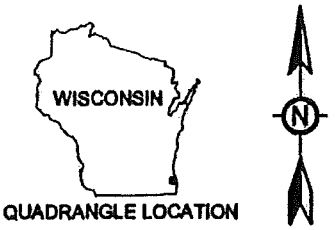
FEET



QUADRANGLE LOCATION

BEAZER EAST, INC. - WABASH ALLOYS FACILITY OAK CREEK, WISCONSIN	DATE: 6/2/09
	DESIGNED: HJW
	CHECKED: DLM
SITE LOCATION and LOCAL TOPOGRAPHY	APPROVED: DLM
	DRAWN: HJW
	PROJ.: 117-2201186
GeoTrans, Inc.	Figure 1

Base map from U.S.G.S. 7.5' SOUTH MILWAUKEE, WISCONSIN and RACINE NORTH, WISCONSIN topographic quadrangle map.

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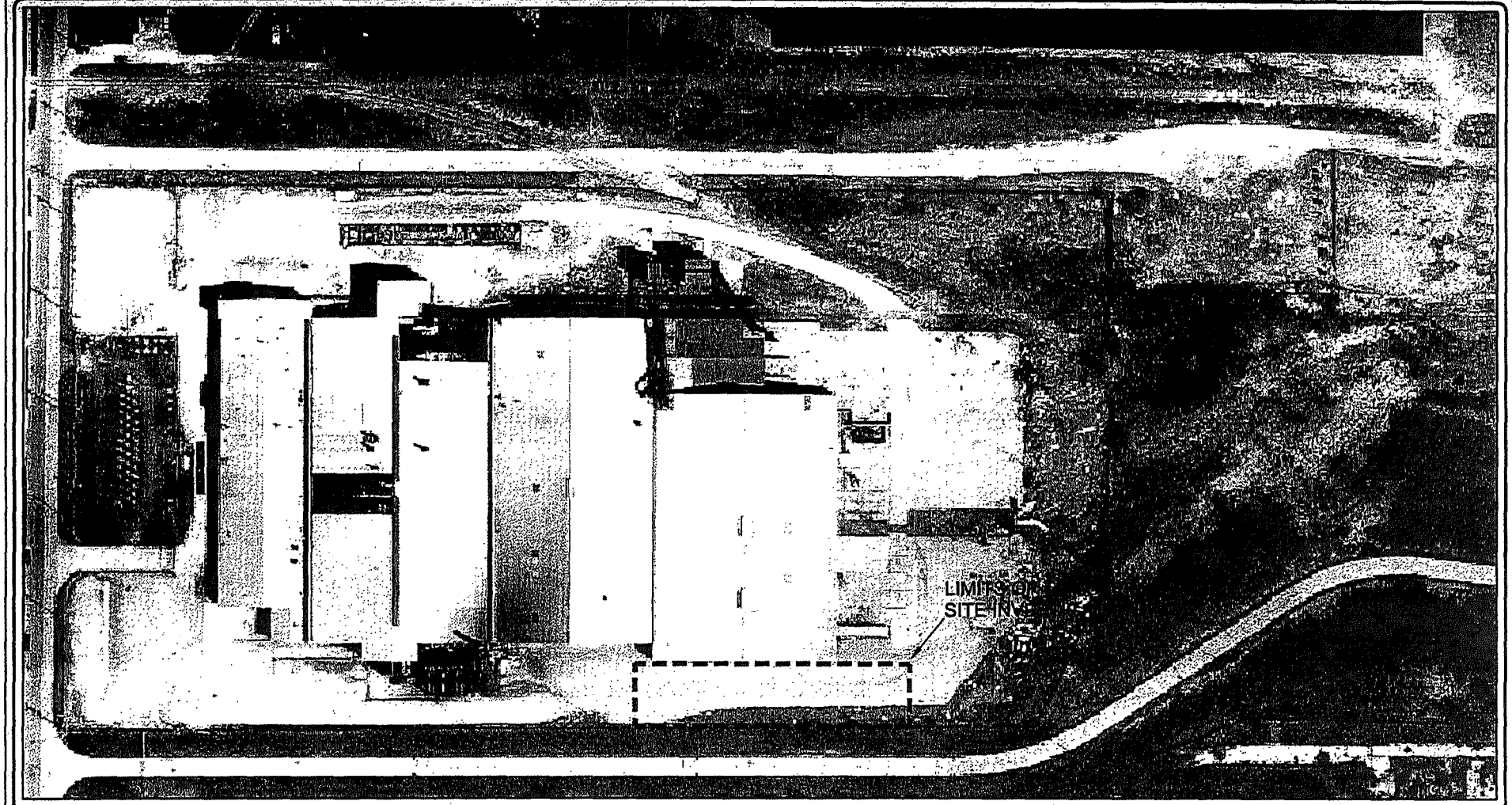

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SCALE IN FEET

N

TITLE: BEAZER EAST, INC. - WABASH ALLOYS FACILITY
SITE LAYOUT AND SITE INVESTIGATION LOCATION

LOCATION: OAK CREEK, WISCONSIN

GeoTrans, Inc.

CHECKED	MRN
DRAFTED	HJW
PROJECT	117-2201155
DATE	8/2/09

FIGURE: 2