BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

Transmitted Via U.S. Mail

November 17, 2004

Mr. James Hosch
Wisconsin Department of Natural Resources
1401 Tower Avenue
Superior, WI 54880

Re: Koppers Inc. Wood-Treating Facility – Superior, Wisconsin
Work Plan for Outfall 001 Drainage Ditch and Crawford Creek Investigation Activities
BBL Project/File No.: 38875.001 #5

Dear Mr. Hosch:

I. INTRODUCTION

On behalf of Beazer East, Inc. (Beazer), Blasland, Bouck & Lee, Inc. (BBL) has prepared this Work Plan for investigating the Outfall 001 drainage ditch and Crawford Creek areas associated with the Koppers Inc. (Koppers) wood-treating facility in Superior, Wisconsin (the Site; Figures 1 and 2). The purpose of the investigation activities summarized herein is to provide additional data for the off-property portion of the Site to support the subsequent identification and evaluation of potential corrective measures and risk-based decisions. The primary components of this work will include installation of test pits, soil borings, and piezometers along the Outfall 001 drainage ditch and sampling/analysis of fish, sediments, floodplain soils, and insects along Crawford Creek. Investigation activities will be performed using procedures that are consistent with prior investigations and previously submitted Standard Operating Procedures (SOPs). An SOP for insect sampling, which has not previously been conducted at the Site, is provided in Attachment A. The remainder of this letter summarizes the purpose, scope of work, and procedures associated with the investigation activities. Implementation support activities, reporting, and schedule are also discussed below.

II. OUTFALL 001 DRAINAGE DITCH INVESTIGATION SCOPE OF WORK

Investigations in the Outfall 001 drainage ditch area will consist of the following:

- **Reconnaissance/Probing** – A reconnaissance will be performed along the Outfall 001 drainage ditch to identify general characteristics of the ditch, depositional areas, potential migration pathways for any dense non-aqueous phase liquid (DNAPL) that may be present, and visibly impacted materials. The reconnaissance will extend from the point where the ditch crosses the northern Koppers property line downstream to the confluence with Crawford Creek (Figure 3). Within this reach, the ditch bottom will be probed at approximately 50-foot intervals by manually pushing a metal rod into the soil until refusal. The exact probing interval will be determined in the field based on actual field conditions and access considerations. Obvious depositional areas will be targeted for probing.

Information will be recorded regarding each probing location, including water depth; thickness of depositional material; general grain size of ditch bottom materials (e.g., gravel, sand, silt, clay); and presence of odors, sheens, staining, and/or DNAPL. A limited number of shallow soil borings may be advanced using a hand auger or Lexan® tubes to confirm the probing results. A flow meter will be used to measure the water velocity at each probing location to assist in assessing flow characteristics and identifying potential depositional areas. Between probing locations, bank materials will be observed for the presence of exposed sand lenses or other strata that could serve as preferential pathways for DNAPL to migrate along the ditch. The probing locations and other notable observations (e.g., depositional areas, exposed sand lenses) will be surveyed using GPS and/or recorded in the field book relative to fixed site features. Reconnaissance/probing observations will be used to determine appropriate locations for soil borings and piezometers.

- **Test Pits** – Up to three test pits will be excavated along the banks of the Outfall 001 drainage ditch just downstream of Hammond Avenue to characterize the geology of soils present along the ditch, evaluate the presence of potential DNAPL migration pathways (e.g., sand lenses or fractures), and identify the distribution (i.e., horizontal and vertical extent) of visibly impacted materials observed during the May 2003 reconnaissance and probing. This area was selected for excavating test pits because the property is owned by Beazer and is more accessible by equipment compared to other portions of the ditch. The proposed locations of the test pits are shown on Figure 3, but are subject to change based on actual field conditions and access considerations. A long-arm excavator will be used to excavate the test pits. The test pits will be photographed and observations will be recorded in the field book. Following completion of each test pit, excavated materials will be re-placed and compacted. The backfilled materials will be seeded and/or covered with erosion controls (e.g., straw mulch and/or biodegradable erosion control fabric) to minimize the potential for erosion of test pit areas.

- **Soil Boring Transects** – Six soil boring transects will be completed across the Outfall 001 drainage ditch. The proposed locations of the soil boring transects are shown on Figure 3, but are subject to change based on actual field conditions and access considerations. To the extent possible, the transects will be aligned with depositional areas in the Outfall 001 drainage ditch observed during the field reconnaissance. The purposes of the soil boring transects are to delineate the horizontal and vertical extent of visually impacted soils and characterize geologic conditions along the ditch. In addition, the soil boring transect located along the Koppers property boundary (see Figure 3), will be used to determine the potential for DNAPL migration pathways along the ditch from the Koppers facility to off-property areas. In this manner, the soil boring transects will serve to provide a visual indication of the lateral and vertical extent of potential impacts in areas where test pits cannot readily be excavated.

  At each transect, soil borings will initially be advanced on each side of the ditch, as close as possible to the edge of water. Two additional borings will then be advanced on each side of the ditch approximately 10 to 20 feet from the initial borings. If necessary, additional borings will be advanced at 5- to 20-foot intervals on each side of the ditch to delineate the horizontal extent of visually impacted soils. To the extent possible, the two initial borings will be advanced to a depth of at least five feet below the bottom elevation of the ditch at that location. Borings will proceed deeper, if possible, in the event that visible impacts continue to be observed. Subsequent step-out borings will be advanced to the approximate bottom elevation of the initial borings, or approximately five feet below the bottom elevation of visibly impacted materials (if any) observed in the adjacent boring (to the extent possible).

Soil borings will be advanced using an ATV Geoprobe® (where accessible) or manual methods (e.g., jack-hammer or tripod-hammer system). Continuous soil samples will be collected, screened with a photoionization detector (PID), and visually characterized. Observations of the recovered soils, including United Soil Classification System (USCS) descriptions, detailed descriptions of DNAPL/staining/sheens/odors, and PID readings will be recorded in the field notebook. Unless the borehole will be used for piezometers installation (see below), soil borings will be backfilled with a grout mixture and covered by soil.

- **Piezometers** – Approximately 12 piezometers will be installed along the Outfall 001 drainage ditch. The purposes of the piezometers are to provide points along the ditch for obtaining water-level data that will be used to assess hydraulic gradients to/from the ditch and to assess the presence of potentially mobile DNAPL. In addition, the geologic data recorded during drilling for the piezometers will supplement the soil boring transect data and be used to generate geology cross sections across the ditch. The proposed locations of the piezometers are shown on Figure 3, but are subject to change based on actual field conditions and access considerations. To the extent possible, the piezometers will be located along the alignment of the soil boring transects.

  Depending on equipment accessibility/terrain, drilling for the piezometers will be conducted using an ATV drill rig, an ATV Geoprobe®, and/or manual methods (e.g., jack-hammer or tripod-hammer system). Piezometers will be constructed of 1-inch diameter PVC casing and 0.020-inch slotted screens. To the extent possible, a sandpack will be placed around the screens and the annular space above the screens will be filled with bentonite chips or grout. The piezometers will extend up to approximately 2 to 3 feet above grade. To protect the piezometers from damage (e.g., high flow conditions in the ditch), 2- to 4-inch diameter PVC outer casings with removable caps will be installed (grouted in place) over each piezometer. At locations accessible by an ATV drill rig (i.e., where larger diameter borings are possible), multiple piezometers screened at various depths may be installed within a single boring. Following installation, the piezometers will be developed by purging/surging to remove fine-grained materials that may have entered the piezometers during installation.

  Proposed depths and screen intervals for each proposed piezometer identified on Figure 3 are summarized below.

  <u>Piezometer Locations A1, B1, C1, and D1</u>

  At these locations, shallow/deep piezometer pairs will be installed immediately adjacent to the ditch. At each location, an initial boring will be advanced to approximately 20 feet below ground surface (bgs). Shallow piezometers will have 5-foot long screens that intersect the water table[1]. Deep piezometers will have 5-foot long screens that intersect any higher permeability (e.g., sand, gravel) materials present beneath the depth of the shallow well. If such materials are not present, the deep piezometers will be screened from 15 to 20 feet bgs.

  <u>Piezometer Locations A2 and D2</u>

  At these locations, shallow/deep piezometer pairs will be installed approximately 20 feet from the ditch. At each location, an initial boring will be advanced to approximately 20 feet bgs. Shallow

[1] For these and other shallow piezometers, the location of the water table may not be readily identifiable due to the low hydraulic conductivity of the clay formation. If necessary, borings may be allowed to recover overnight to identify the water table location prior to installing the piezometers.

piezometers will have 5-foot long screens that intersect the water table. Deep piezometers will have 5-foot long screens that intersect any higher permeability (e.g., sand, gravel) materials present beneath the depth of the shallow well. If such materials are not present, the deep piezometers will be screened from 15 to 20 feet bgs.

Piezometer Locations B2 and C2

At these locations, piezometer pairs/nests will be installed at the top of the bank. At piezometer locations B2 and C2 an initial boring will be advanced to the approximate elevation of the bottom of the deep piezometer installed adjacent to the ditch at corresponding locations B1 and C1. Anticipated boring depths are 30 feet bgs for piezometer location B2 and 40 feet bgs for piezometer location C2. Shallow piezometers will be installed at each location and will have 5-foot long screens that intersect the water table. Deeper piezometers will be installed to screen any higher permeability (e.g., sand, gravel) materials present beneath the depth of the shallow well. If such materials are not present, a single deep piezometer will be installed at each location using a 5-foot long screen, with the top of the screen located 5 feet below the bottom of the screened interval of the adjacent shallow piezometer.

- **Surface Water Gauges** – As shown on Figure 3, surface water gauges will be installed in the center of the Outfall 001 drainage ditch adjacent to piezometer locations A1, B1, C1, and D1, at the upstream end of the ditch, and at the confluence with Crawford Creek. The surface water gauges will consist of metal rods manually driven into the ditch bottom. The rods will be flagged and/or spray painted so that they can more easily be located for water-level measurement. The gauges will be used as surface water elevation measuring points by surveying the elevation of the top of the rod (see below) and measuring the distance from the top of the rod to the water surface at each location. Water-level measurement data collected at these points will be used in conjunction with water-level measurements at the piezometers to determine hydraulic gradients to/from the ditch and develop cross-sectional potentiometric surfaces across the ditch. Data will also be used to develop a profile view of the water surface along the ditch from the Koppers property downstream to the confluence with Crawford Creek.

- **Monitoring/Testing** – Following installation and development of the piezometers and installation of the surface water gauges, two rounds of water-level measurements will be performed. During each round, water-levels will be measured from the top of each piezometer/surface water gauge using an electronic water-level probe. In addition, each piezometer will be checked for accumulations of DNAPL using an oil/water interface probe or weighted string. If significant amounts of DNAPL are observed in piezometers during monitoring (not anticipated), samples will be collected for physical property testing (density, viscosity, and interfacial tension) and DNAPL recovery tests may be conducted. In addition, slug tests and/or specific capacity tests may be performed at up to four selected piezometers to determine hydraulic conductivities of the various screened materials.

III. CRAWFORD CREEK INVESTIGATION SCOPE OF WORK

Investigations in the Crawford Creek floodplain area will consist of the following:

- **Fish and Sediment Sampling** – Six fish and six sediment samples will be collected from Crawford Creek to evaluate the bioaccumulation potential of polycyclic aromatic hydrocarbons (PAHs) and polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans (PCDDs/PCDFs). Fish/sediment sampling locations are shown on Figure 3. These co-located data will be used to supplement the

bioaccumulation models that have previously been used to evaluate the potential for Site-related impacts to predatory species in the Nemadji River.

Each fish sampling station will consist of a 200-foot reach of the creek. It is anticipated that three minnow traps will be deployed at each sampling station (in the upstream, middle, and downstream sections of each 200-foot reach). Minnows captured from each of the three individual traps at each sampling station will be composited for laboratory analysis of PAHs (USEPA Method 8270C), PCDDs/PCDFs (USEPA Method 8290), and percent extractable lipid (gravimetric per USEPA Method 8290). While minnow traps require the least amount of effort to collect fish samples, experience in other streams with similar characteristics as Crawford Creek suggests that such traps may not collect enough tissue for analysis. If that occurs, fish from each 200-foot reach of creek will be collected using a portable electroshocking device.

A composite sediment sample will also be collected to correspond to each fish sampling station. Each composite will be composed of a nine individual grab samples collected from the 0- to 3-inch sediment depth interval; three grab samples will be collected in the vicinity of each minnow trap (one adjacent, one approximately 25 feet upstream, and one approximately 25 feet downstream). (If fish are collected using electroshocking, the nine individual sediment grab samples will be collected from equidistant sampling locations within the reach from which fish were collected.) Sediment samples will be analyzed for PAHs (USEPA Method 8270C), PCDDs/PCDFs (USEPA Method 8290), and total organic carbon (TOC; Walkley-Black Method). Sediment samples will be collected using Lexan® tubes, an Ekman dredge, or another suitable sampling device.

- **Floodplain Soil Sampling** – Soil samples will be collected from the Crawford Creek floodplain upstream of the railroad embankment to characterize concentrations of PAHs and PCDDs/PCDFs and to develop exposure-point concentrations in support of subsequent risk-related evaluations. Floodplain soil sampling locations are shown on Figure 3.

  As indicated on Figure 3, a total of 22 floodplain soil samples will be collected from transects approximately 150 feet in length; four transects will be located approximately 5 feet from (and parallel to) the creek bank, 12 will be located approximately 50 feet from the bank, and six will be located approximately 100 feet from the bank. A composite soil sample will be collected from each transect. Each composite will be composed of five individual grab samples (equally spaced along the 150-foot transect) collected from the 0- to 6-inch soil interval.

  Two additional composite floodplain soils samples will be collected from the portion of the Crawford Creek floodplain adjacent to the Outfall 001 drainage ditch. These two samples will be composed of four individual grab samples collected from the 0- to 6-inch soil interval at the north, south, east, and west edges of the 60-foot diameter circular areas shown on Figure 3.

  All floodplain soil samples will be analyzed for PAHs (USEPA Method 8270C), PCDDs/PCDFs (USEPA Method 8290), and TOC (Walkley-Black Method). Soil samples will be collected using 3-inch diameter soil/mud augers, or another suitable sampling device.

- **Insect Sampling** – Adult (flying) insects will be collected in the Crawford Creek floodplain to determine the potential concentration of PAHs and PCDDs/PCDFs in the diet of insectivorous birds and mammals. The resulting data will be used to support subsequent evaluations of the potential for Site-related constituents to accumulate within the food chain. Four insect sampling stations will be established upstream of the railroad embankment (Figure 3). One passive black light insect trap will

- be deployed at each sampling station; collected insects will be composited into a single sample at each of the four stations (for a total of four samples). Insect samples will be analyzed for PAHs (USEPA Method 8270C) and PCDDs/PCDFs (USEPA Method 8290). Insects will be collected over the course of one to five nights, depending upon the time period required to collect sufficient biomass to meet the minimum tissue mass quota for chemical analysis. An SOP for insect sampling is provided as Attachment A.

IV. IMPLEMENTATION SUPPORT ACTIVITIES

The following activities will be conducted to support the implementation of the investigation activities described above in Sections II and III:

- **Property Access -** The proposed investigation activities will occur on public and private properties. Beazer will coordinate with the respective property owners to obtain access approvals as necessary to perform the work.

- **Utility Clearances** – Prior to conducting the test pit excavations, soil boring, and piezometers installations, underground utilities (if any) within the Outfall 001 drainage ditch work areas will be marked out by calling Diggers Hotline.

- **Equipment Cleaning** – To the extent possible, soil and sediment samples will be collected using dedicated/disposable sampling equipment. If any non-dedicated or non-disposable sampling equipment is used, those items will be cleaned prior to use at each sample location. Cleaning of sampling equipment will be performed using non-phosphate soaps and solvents, as appropriate. All cleaning fluids will be collected and appropriately containerized for disposal, as discussed below.

  The excavator bucket and all down-hold drilling components (e.g., augers, rods, split-spoon samplers) will be cleaned prior to use at the first location and at the completion of the investigation activities. Cleaning between locations may also be performed as necessary, but is not required since no analytical samples will be collected from the test pits, soil borings, or piezometers. Cleaning will be performed on a lined/bermed equipment cleaning pad using a high-pressure washer.

- **Investigation-Derived Waste Management** – Equipment cleaning fluids; soil and water generated during the soil boring, piezometer installation/development, and monitoring/testing activities; and miscellaneous wastes, such as used personal protective equipment (PPE), disposable sampling equipment, and equipment cleaning pad liner will be placed into 55-gallon drums and staged at a designated area at the Koppers facility for subsequent disposal by Beazer. All drums will be properly labeled with their contents and date of generation.

- **Survey** – Following completion of the field investigation activities, the locations of test pits, soil boring transect endpoints, piezometers, surface water gauges, central locations of composite samples, and/or other points will be surveyed to record the locations so that they can be accurately depicted on maps and re-established if necessary in the future. In addition, the elevations of each piezometer and surface water gauge will be surveyed so that depth-to-water measurements can be converted into groundwater/surface water elevations.

V. REPORTING

Following completion of the investigation activities and receipt of all laboratory analytical data, a report will be prepared to summarize the investigation activities described above, as well as previous off-property investigation activities. The report will summarize the activities conducted, present the findings and analytical results, and draw conclusions based on the available data. The report will also include data summary tables and sample location maps. To the extent appropriate, the report will be formatted to meet the requirements for site investigation reports specified in NR 716.15.

VI. SCHEDULE

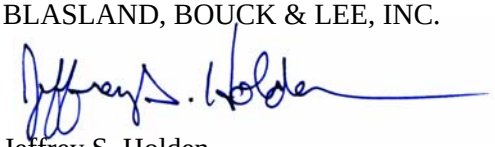
It is anticipated that the Outfall 001 drainage ditch investigations will require approximately four weeks to complete. Pending the execution of property access agreements and weather conditions, certain of these activities may be conducted this fall (i.e., November 2004); any of the proposed activities not completed during the fall will be performed as weather conditions allow in the spring. The Crawford Creek investigation activities will be conducted next spring (i.e., May/June 2005) and will require approximately two to three weeks to complete.

Regardless of the start time or duration of the field work, the report summarizing the field investigation results will be provided to the WDNR within approximately 90 days of the completion of the field work and receipt of all associated laboratory analytical data.

Please feel free to contact me at (860) 627-8489, or Ms. Jane Patarcity of Beazer at (412) 208-8813, with any questions or comments.

Sincerely,

BLASLAND, BOUCK & LEE, INC.



Jeffrey S. Holden
Associate

DGB/csc
Enclosures
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cc: Steve LaValley, WDNR
Mark Gordon, WDNR
John Robinson, WDNR
Henry Nehls-Lowe, WDHFS
Vicki Drake, DCHD
Michael Kolanczyk
Robert Egan, USEPA
Jane Patarcity, Beazer
Brian Magee, AMEC
Paul Anderson, AMEC
Patrick Stark, Koppers
Tim Ries, Koppers
David Bessingpas, BBL

Figures

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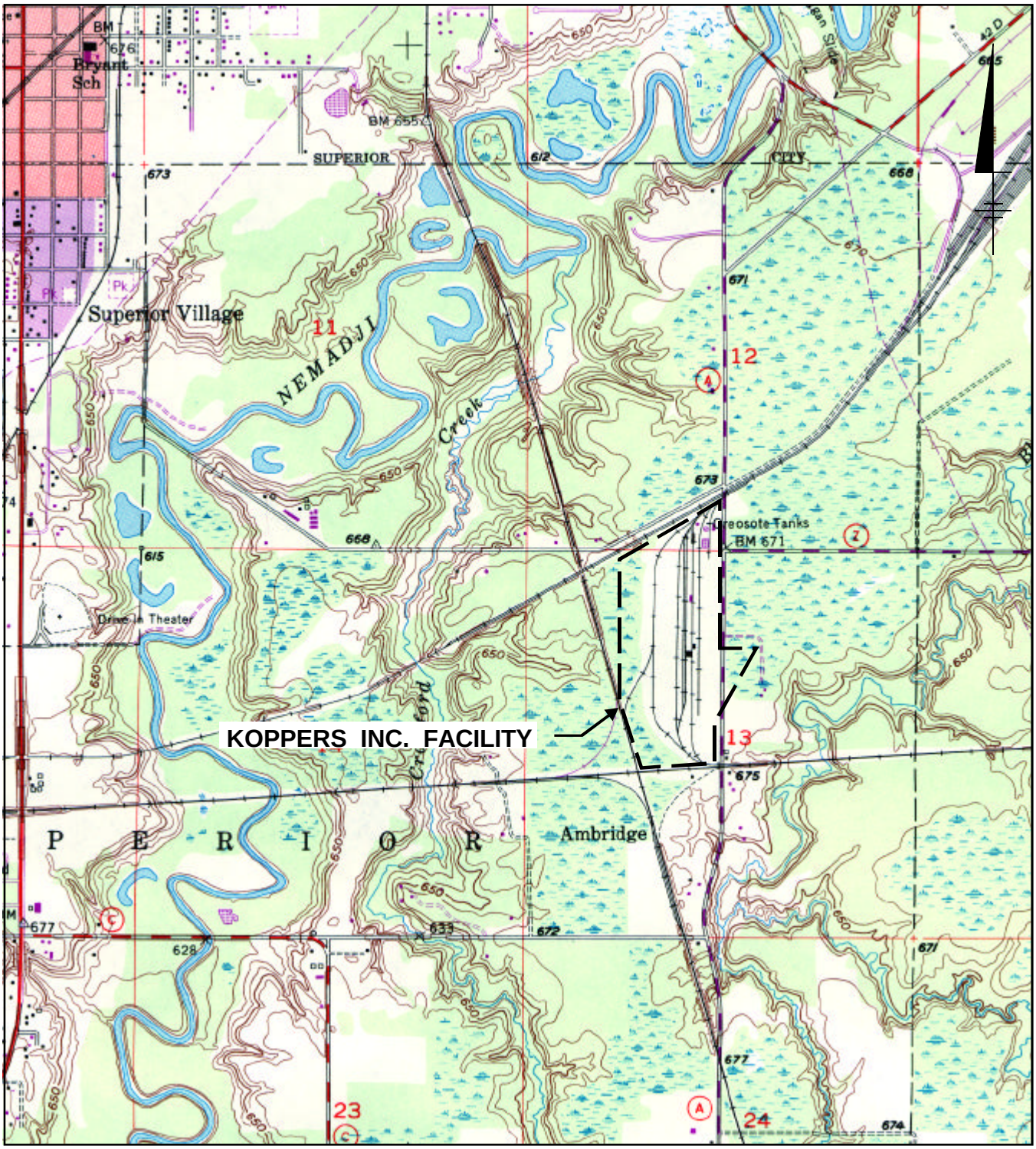

REFERENCE: USGS 7.5 MINUTE QUAD. SERIES SUPERIOR, WISCONSIN - MINNESOTA, 1954, PHOTOREVISED 1993.

2000' 0 2000'

Approximate Scale: 1" = 2000'

LEGEND:

APPROXIMATE PROPERTY LINE

AREA LOCATION

8/13/04 SYR-D85-MRC DJH LJP
38875001/38875n01.cdr

BEAZER EAST, INC.
KOPPERS INC. WOOD-TREATING FACILITY
SUPERIOR, WISCONSIN

SITE LOCATION MAP

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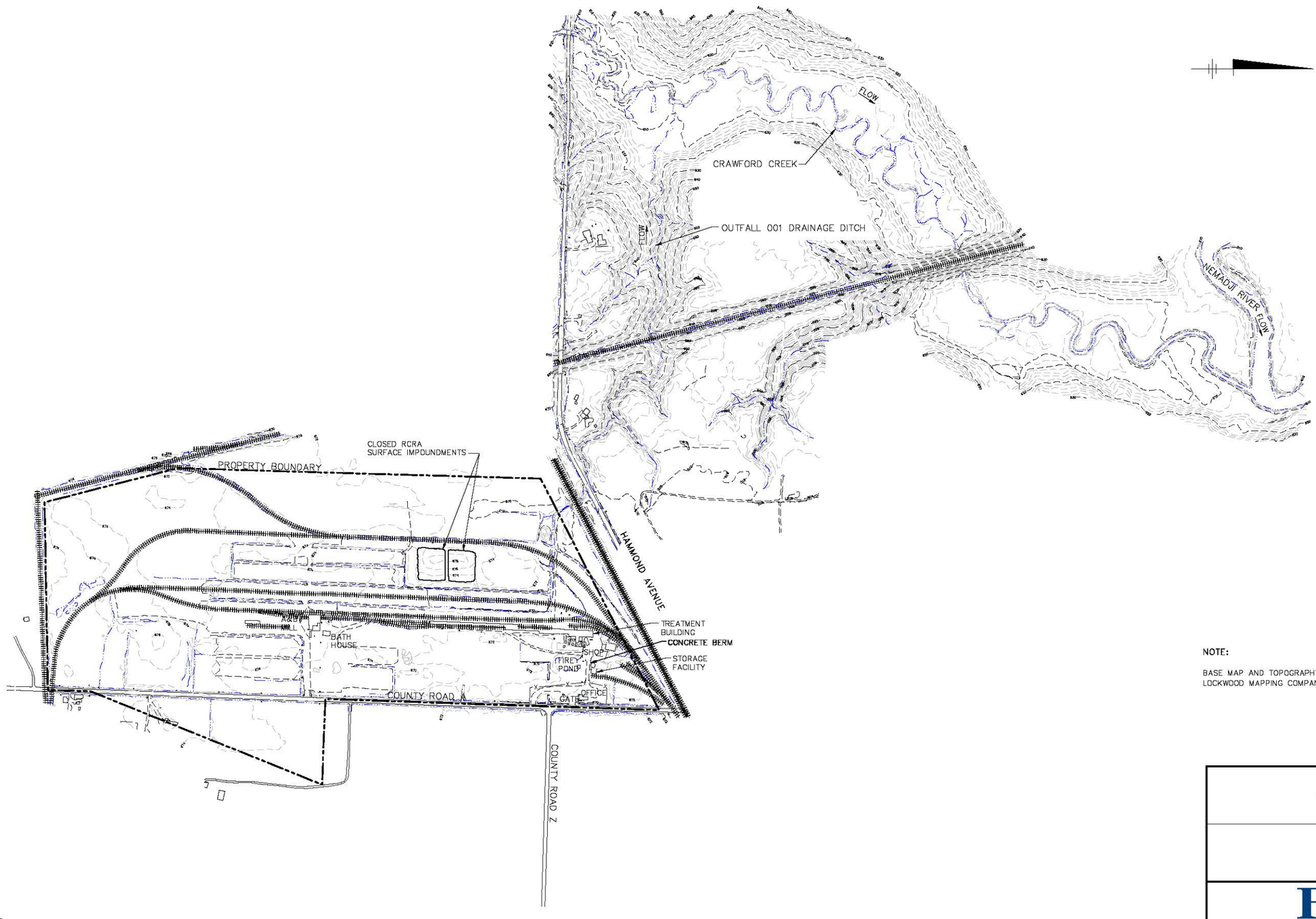
FIGURE 1



NOTE:

BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LOCKWOOD MAPPING COMPANY OF ROCHESTER, NY (12/28/01 AND 04/04/03).

0 300' 600'
GRAPHIC SCALE

BEAZER EAST, INC.
KOPPERS INC. FACILITY
SUPERIOR, WISCONSIN

SITE PLAN

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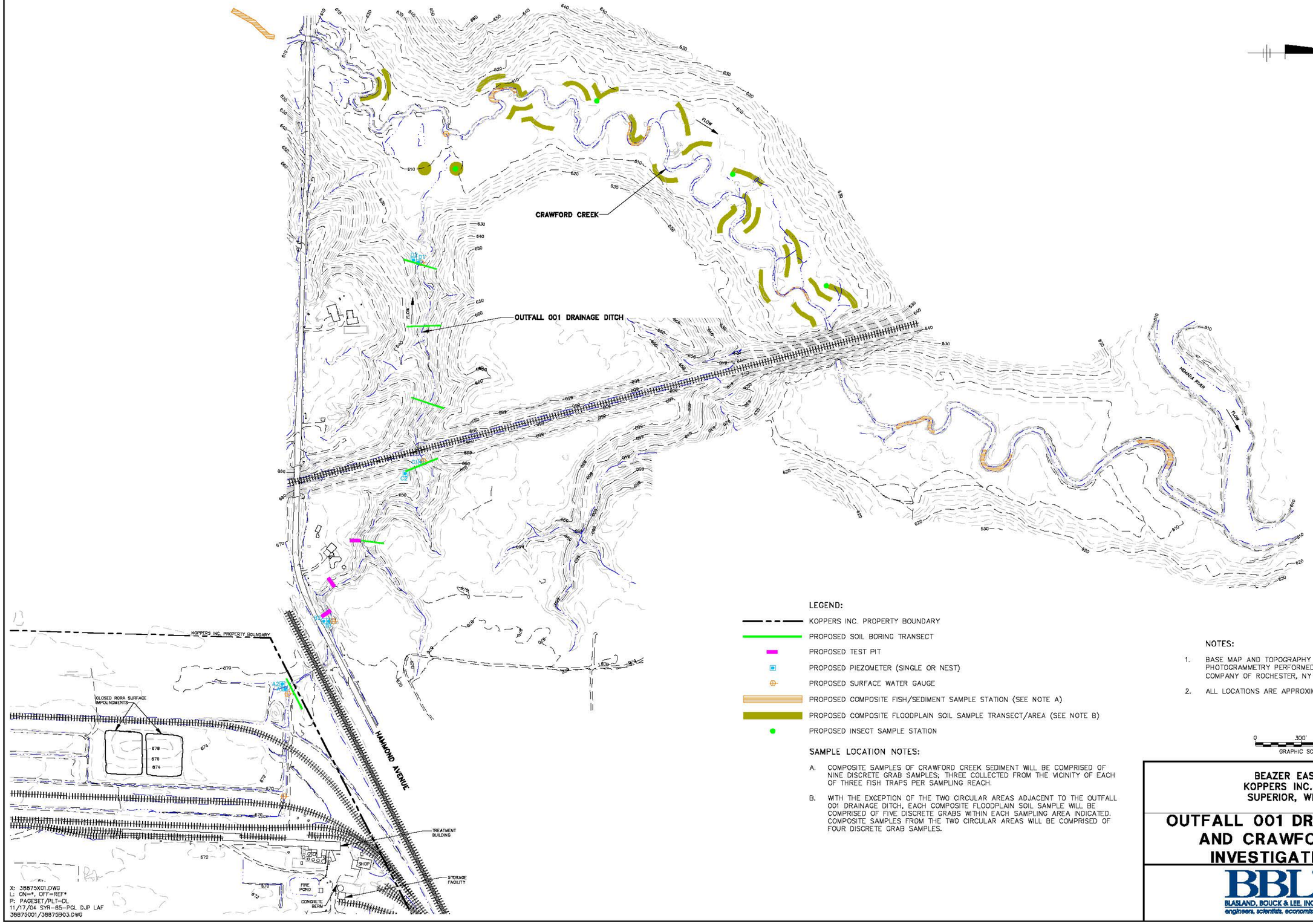
FIGURE
2

X: 38875X01.DWG
L: ON=*;OFF=REF*
P: PAGESET/PLT-DL
11/17/04 SYR-BS-KMD DJP LAF
38875001/38875901.DWG



X: 38875X01.DWG
L: ON=*, OFF=REF*
P: PAGESET/PLT-DL
11/17/04 SYR-85-PGL DJP LAF
38875001/38875B03.DWG

LEGEND:

- KOPPERS INC. PROPERTY BOUNDARY
- PROPOSED SOIL BORING TRANSECT
- PROPOSED TEST PIT
- PROPOSED PIEZOMETER (SINGLE OR NEST)
- PROPOSED SURFACE WATER GAUGE
- PROPOSED COMPOSITE FISH/SEDIMENT SAMPLE STATION (SEE NOTE A)
- PROPOSED COMPOSITE FLOODPLAIN SOIL SAMPLE TRANSECT/AREA (SEE NOTE B)
- PROPOSED INSECT SAMPLE STATION

SAMPLE LOCATION NOTES:

A. COMPOSITE SAMPLES OF CRAWFORD CREEK SEDIMENT WILL BE COMPRISED OF NINE DISCRETE GRAB SAMPLES; THREE COLLECTED FROM THE VICINITY OF EACH OF THREE FISH TRAPS PER SAMPLING REACH.

B. WITH THE EXCEPTION OF THE TWO CIRCULAR AREAS ADJACENT TO THE OUTFALL 001 DRAINAGE DITCH, EACH COMPOSITE FLOODPLAIN SOIL SAMPLE WILL BE COMPRISED OF FIVE DISCRETE GRABS WITHIN EACH SAMPLING AREA INDICATED. COMPOSITE SAMPLES FROM THE TWO CIRCULAR AREAS WILL BE COMPRISED OF FOUR DISCRETE GRAB SAMPLES.

NOTES:

1. BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LOCKWOOD MAPPING COMPANY OF ROCHESTER, NY (12/28/01).
2. ALL LOCATIONS ARE APPROXIMATE.

0 300' 600'
GRAPHIC SCALE

BEAZER EAST, INC.
KOPPERS INC. FACILITY
SUPERIOR, WISCONSIN

OUTFALL 001 DRAINAGE DITCH AND CRAWFORD CREEK INVESTIGATION PLAN

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FIGURE
3

Attachment A

Standard Operating Procedures for Sampling of Flying Insects

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PURPOSE

To establish a standard protocol for all AMEC field personnel to ensure acceptable, consistent and clean sampling techniques are followed during the sampling of flying insects.

RESPONSIBILITIES

A qualified individual, preferably a technician with training in biology or a related field (e.g., entomology, is responsible for the sampling (or oversight of) flying insects. Field personnel are responsible for acquiring accurate, representative information about the nocturnal capture of flying insects. Regardless of the capture technique used, certain protocols must be followed in order to obtain representative samples. The sampling unit shall be inspected for proper operation prior to the deployment of the unit. The site area where the unit is to be deployed shall be inspected to ensure that there are no immediate hazards to the field personnel (e.g., steep slippery banks, broken glass, etc.).

PROCEDURE

The sampling of flying insects is always performed at night. AMEC employs the use of "Universal Blacklight Traps" (BioQuip, Rancho Dominguez, CA) because they are efficient at drawing and capturing large numbers of insects within a relatively short time frame. In general, more than the 40-gram minimum tissue mass required for any analytical procedure can be obtained within one trap night. It important that the sampling period chosen be scheduled around the period of a new moon (plus or minus 10 days), as the bright ambient light of a full moon will inhibit the nocturnal activity of most flying insects.

The Universal Blacklight Trap (UBT) consists of a U-shaped ultraviolet bulb that is situated at the center of four vertical Plexiglas panes. Insects that are drawn to the blacklight will run into one of the four Plexiglas panes and fall down into an inverted metal cone that sits on top of a 5 gallon plastic bucket. Once inside the bucket, the insect is overcome by fumes that are generated by a gauze sponge that was previously soaked in 80% ethanol.

The steps required to obtain a representative flying insect sample are presented below:

- Determine how many UBTs your project will require and sign each unit out of the Equipment Room. Make sure you write down the Project Name and Project Number, as well as the dates you will be using the UBTs, into the Equipment Signout Log.

- Make sure all of the parts of the UBT are available. This includes, moving in order from the bottom to the top of the unit, the following:

    - Plastic 5-gallon pail (with bottom drain pipe)
    - Disposable gauze sponge
    - Aluminum cone (inverted in field)
    - Plexiglas panes (with small bent metal pins for securing hinges)
    - U-shaped blacklight bulb (w/ extra bulb replacement if necessary)
    - Electrical cord with female plug (blacklight end) and terminal clips (12V battery end)
    - Aluminum lid (with small gage bungee cord for securing unit in field)

  You will also need the following items to run and to sample the unit:

    - 12V lawn tractor battery (make sure lead terminals are clean/shiny)
    - large gage bungee cord for transporting battery overland in field

- 12V battery charger
- long forceps
- rubber spatula
- clean sample container (generally a clean 8 oz. wide-mouth jar obtained from analytical lab)
- sample labels
- clear packing tape
- bubble wrap
- 1 gallon Ziploc® bags
- Sharpie
- plastic cooler with prepacked ice bags
- flashlight

- Inspect each unit to make sure it is clean upon checkout from the equipment room. If it is not clean, then 1) hand wash the unit in a mild solution of Alconox 2) rinse with water 3) rinse with isopropanol 4) rinse with DI water and 5) and let the unit air dry.

- Place all UBT parts within the unit. Place the inverted aluminum cone on top of the unit. Place the aluminum lid on top of the unit and secure with small gage bungee cord. UBT unit is now ready to transport into the field.

Once in the field:

- Choose a location that, once the blacklight is turned on, is anticipated to be "out of sight" of any human activity. These ultraviolet lights are fairly bright so they may be vandalized if they can be seen from inhabited areas of the site in question. Once assembled, the UBTs are also fairly fragile so make sure the unit is on flat ground and that it is not in an area that can be washed out (e.g., immediate floodplain) by overnight storm activity.

- Assemble the unit according to the manufacturer's instructions. If instructions are not available, assemble from the "bottom up" as indicated in the UBT list above.

- Once assembled, test the unit by hooking up the red (hot) terminal clip on the UBT electrical cord to the positive terminal (+) of the lawn tractor battery. Next hook up the black (grounded) terminal clip to the negative (-) pole of the lawn tractor battery. The UV light in the UBT should illuminate.

- If the UV light does not illuminate, check and make sure that (a) the female plug connection to the UV bulb is tight and (b) the metal clips on the other end of the cord are digging into the lead terminal (sometimes oxidized lead on the battery terminal will prevent a proper connection). If the UV light still does not illuminate, the bulb is dead and must be replaced.

- Time your field schedule so that each UBT unit is turned on at least one hour after sunset. Carry a flashlight to ensure that you can make your way back to your vehicle in the dark without tripping.

- Upon retrieval the next morning, the UV light should be off as the 12V battery can only provide 4-6 hours of DC current to the bulb.

- Carefully unhook the small gage bungee cord from the top of the UBT. Carefully remove the aluminum lid, the vertical Plexiglas panes (w/ UV bulb) and the inverted aluminum cone.

- If taxonomy is required, count and separate aquatic from terrestrial insects. If necessary, containerize these two groups separately. It may be necessary to remove some insects from the gauze sponge at the bottom of the 5-gallon pail using only forceps.

- Using clean techniques, transfer large insects into the sample jar using long forceps. Transfer the remaining insects into the sample jar using a clean rubber spatula.

- Put the lid on the jar, label it appropriately (site name, sample location, time, date, sampler's initials, analytical method, media type), and wrap the label with clear packing tape to prevent smearing and loss of sample ID or label). If collecting other media along with flying insects, make sure to differentiate between the samples at one given location when labeling. As an example, here is a naming scheme for three samples collected at location "5A":

	Media		Sample ID
o	Fish	–	FS-5A
o	Sediment	–	SED-5A
o	Flying Insects	–	FLY-5A

- Place jar in bubble wrap and secure this with clear packing tape. Place jar inside a sealable Ziploc® bag and place into cooler containing ice.

- Once field sampling is complete, fill out the appropriate Chain-of-Custody forms. Remove AMEC copy of the COC form. Place laboratory copy of COC form in a one gallon Ziploc® bag and seal. Place COC form in cooler. Seal cooler with COC Seal and secure both the cooler and the COC Seal with clear packing tape. Ship cooler overnight to appropriate laboratory address. If sampling occurs on a Friday, make sure to mark "Saturday Delivery" on packing slip and notify lab to ensure that a lab technician will be there to receive the cooler.