Beazer

BEAZER EAST, INC. C/O THREE RIVERS MANAGEMENT, INC.
MANOR OAK ONE, SUITE 200, 1910 COCHRAN ROAD, PITTSBURGH, PA 15220

December 7, 2011

Stephen Galarneau
WDNR
101 South Webster Street (WT/3)
Post Office Box 7921
Madison, WI 53707-7921

Mark Giesfeldt
WDNR
101 South Webster Street - RR/5
Post Office Box 7921
Madison, WI 53707-7921

John Robinson
WDNR
Division of Air and Waste
107 Sutliff Avenue
Rhinelander, WI 54501-3349

Re: Koppers Inc. Wood-Treating Facility, Superior, Wisconsin

Dear Mr. Galarneau, Mr. Giesfeldt and Mr. Robinson:

During a conference call and LiveMeeting on November 11, 2011, we described the corrective actions envisioned by Beazer East, Inc. (Beazer) for the "off-property" portion of the Koppers Inc. wood-treating facility in Superior, Wisconsin. This was presented in support of our continuing discussion of possible opportunities for collaboration among Beazer, Wisconsin Department of Natural Resources, and the Great Lakes National Program Office for project enhancement under the Great Lakes Legacy Act.

In the course of the November 11 call, you requested that we provide a focused summary of the basis for and scope of the off-property remedial approach proposed by Beazer. Accordingly, attached please find a summary of the proposed approach. Note that this approach builds upon the results of the extensive prior Site investigations that have been presented to the WDNR, most notably including the February 2006 *Off-Property Investigation Data Summary Document* (Blasland, Bouck & Lee, Inc., 2006).

Please feel free to contact me with any questions regarding the attached. In the interim, we look forward to further discussing this opportunity during our meeting on December 21, 2011.

Sincerely,

for

Jane Patarcity
Sr. Environmental Manager

Cc: Mark Thimke, Esq., Foley & Lardner
Jeff Holden, ARCADIS
Paul Kline, Esq., Beazer

Writer's Direct Dial: 412/208-8813

Off-prop approach to WDNR_2491112248.doc

Beazer East, Inc.
Koppers Inc. Facility – Superior, WI
Recommended Corrective Actions for Off-Property Areas

1. Introduction

This document summarizes the basis for and scope of Beazer East, Inc.'s (Beazer's) recommended corrective action approach for the off-property portion of the Koppers Inc. (KI) Facility in Superior, Wisconsin (the Site). The summary addresses key findings from the site investigation and describes the proposed remedial action for the Crawford Creek portion of the Site. This summary also addresses the limitations of implementing a large-scale removal alternative given the unique nature of Crawford Creek, but acknowledges the potential for more focused opportunities for project "betterment" in conjunction with the Great Lakes National Program Office (GLNPO).

2. Background Information

2.1 Summary of Site Conditions

The KI Facility occupies approximately 112 acres near the intersections of County Roads A and Z southwest of Superior, Wisconsin. Wood treating operations commenced in approximately 1928, and continued under various owners until 2006, when KI (a company unaffiliated with Beazer) discontinued treatment operations and dismantled the majority of the facility. Currently, KI uses the southern portion of the facility for storage, sorting and shipment of untreated railroad ties. A shop and office building remain in the northern portion of the facility. Rail spurs traversing the property are used for delivery and shipment of untreated wood products.

Pressure-treated railroad cross ties, bridge timbers, switch ties and crossing panels were historically produced at the KI Facility. Creosote with a number 6 fuel oil carrier was the primary preservative used at the plant; however, pentachlorophenol with a petroleum oil carrier was also used as a preservative between 1955 and 1979.

As a result of historical operations, wood-treating compounds are present in soils, sediment, and groundwater in various areas of the KI property, as well as in the primary drainage pathway from the property. Corrective actions for the on property portion of the Site were implemented between 2010 and 2011. This document addresses the off-property portion of the Site, which includes the Tributary to Crawford Creek, Crawford Creek and adjacent bank/floodplain areas. See Figure 1.

2.2 Key Site Investigation Findings

The key findings are:

- Primary constituents of potential concern (COPCs) include polycyclic aromatic hydrocarbons (PAHs) and polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDDs/PCDFs).

- Dissolved-phase constituents are relatively low in surface water samples. However, sheens are periodically observed on surface water in the Tributary to Crawford Creek and Crawford Creek, resulting from the presence of creosote-like product in sediments and bank soils.

- Sediments containing creosote-like product were observed at intermittent locations along the entire length of the Tributary to Crawford Creek and in Crawford Creek between the confluence of the Tributary to Crawford Creek and the railroad embankment. Creosote-like product was not observed in Crawford Creek sediments downstream of the railroad embankment.

- Sediments with the highest COPC concentrations were generally located upstream of the railroad embankment.

- Creosote-like product was observed in isolated cracks/fractures within the clay bank/floodplain soils along the Tributary to Crawford Creek and along Crawford Creek.

- A black stained layer up to 2-feet thick was observed in several locations along the Crawford Creek floodplain; this layer was typically encountered two feet below the surface.

Additional information is available in the *Off-Property Investigation Data Summary Report* (BBL, 2006).

2.3 Conceptual Site Model

Based on the Site history and investigation findings summarized above, the following bullets describe the conceptual site model for the off-property portion of the Site:

- During historic wood-treating operations at the Site, wood-treating materials/constituents were released to a drainage ditch that exits in the northwest corner of the KI property, and subsequently migrated downstream via the Tributary to Crawford Creek and ultimately to Crawford Creek.

- During high flow events, wood-treating materials/constituents were transported out of the Tributary and Creek channels and deposited on the adjacent bank/floodplain soils. Being heavier than water, creosote-like material infiltrated clay fractures and is found at depths up to 24 feet bgs and lateral distances up to 300 feet from the Tributary/Creek channels. This material is at or below the bottom of the channel and is overlain by cleaner bank/floodplain soils.

- The black stained layer in the floodplain resulted from the historic releases. In more recent years, cleaner soils were deposited over the top of this stained layer.

- Periodic sheens on the surface water are observed when creosote-like material is released from the fractures.

2.4 Key Factors Affecting Corrective Action Scope and Feasibility

The following key considerations affect the scope and feasibility of corrective actions:

- Crawford Creek floodplain is highly susceptible to flooding. Work in this area represents extreme risk of inundation and flooding of equipment and work areas for the duration of the work.

- The depth of observed impacts in bank/floodplain soils adjacent to the Tributary and Crawford Creek range up to 24 feet. Excavation to these depths would require extensive engineering controls (e.g., trench boxes, sheet piling, etc.) and management of water.

- Creosote-like product is primarily present in isolated cracks/fractures within the clay bank/floodplain and is estimated to occupy a very small portion (i.e., less than 1 percent) of the soil matrix.

- The distribution of materials in subsurface clay fractures makes a complete removal impracticable.

- Excavated materials would be consolidated in a Corrective Action Management Unit (CAMU) containment cell located on the on-property portion of the Site to the extent space is available. Off-site disposal options are limited.

- Private property owners are concerned about disturbance of their property, which likely will make access difficult.

- Soft wetland/floodplain soils restrict ready access to the work areas. Substantial access roads would be required for equipment access.

- The presence of active railroad lines complicates access to the work areas from the elevated rail embankment.

- Wetland mitigation may be necessary depending upon the potential disturbance caused by the remedial measures.

3. Beazer's Recommended Corrective Action Approach

3.1 Corrective Action Areas

Figure 2 illustrates the following three areas where corrective actions are proposed:

- "Area A" - Sediment and bank soil adjacent to the portion of the Tributary to Crawford Creek from the Koppers property boundary downstream to the Crawford Creek floodplain

- "Area B" - Sediment and floodplain soil adjacent to the portion of the Tributary to Crawford Creek located within the Crawford Creek floodplain

- "Area C" - Sediment in the portion of Crawford Creek between the confluence with the Tributary to Crawford Creek downstream to the railroad embankment

3.2 Recommended Corrective Actions

The corrective actions recommended for each of the areas are summarized below. Beazer's recommended approach focuses on isolation/containment-based alternatives, as opposed to removal, due to the practical limitations of the Site.

Area A – Tributary from Hammond Avenue to Crawford Creek Floodplain[1]

For Area A, a containment approach is recommended. An engineered cover would be placed over affected Tributary sediments and bank soils. A new waterway would be created that would include an engineered liner system with a layer of Reactive Core Mat™ (RCM)[2] to inhibit potential migration of creosote-like product and sheens into the restored channel. See Figure 3.

Area B – Tributary within Crawford Creek Floodplain

For Area B, a new channel would be created along with containment of the affected floodplain and old channel areas. This alternative is a combination removal and in-situ containment approach that includes excavating affected materials from the bottom and banks of the Tributary to Crawford Creek, grading the excavated materials within the adjacent floodplain area, reconstructing a clean flow channel, and installing a cover over affected floodplain soils outside of the excavation area. See Figure 4.

A layer of RCM would be used to inhibit potential migration of creosote-like product and sheens into the restored channel.

Area C – Creek from Tributary to Railroad Embankment

For Area C, the Crawford Creek channel would be relocated to an unaffected area located west/northwest of the existing channel location. The existing channel would be filled with clean materials excavated during construction of the new channel. The preliminary new channel route is shown on Figure 5.

The new creek channel will utilize natural channel restoration methods, to restore or improve the character, habitat, and velocity diversity of the existing channel. The new channel will be designed with a substrate that supports the remedy as well as the benthic community. Limited stone protection may be necessary in areas erosion-susceptible (e.g., outer bend of meanders), but natural bed and bank materials will be utilized to the extent possible. RCM likely will be required to support the remedy where the new channel reconnects to the existing channel just upstream of the railroad embankment. Bioengineered structures (e.g., wattles, tree crowns, or diversion structures) may also be included in the restoration to replace and enhance invertebrate and fish habitat that currently exists. The use of these structures will be determined during design with the goal of replacing and enhancing habitat, to the extent practical, while also meeting the remedial action objectives.

For each area, short-term (i.e., 1 to 3 years) post-construction monitoring would be performed to ensure that vegetative growth becomes adequately reestablished, and that restored conditions function as planned until growth is achieved and conditions are stabilized.

---

[1] The portion of the Tributary between Koppers property boundary and Hammond Avenue would be addressed in a similar manner as the completed on-property remedy: removal of up to 2 feet of affected bottom and bank materials, and installation of an engineered liner system, including Reactive Core Mat™ (RCM).

[2] RCM product information is provided in Attachment 1.

4. Limiting Factors for Removal-Based Alternatives

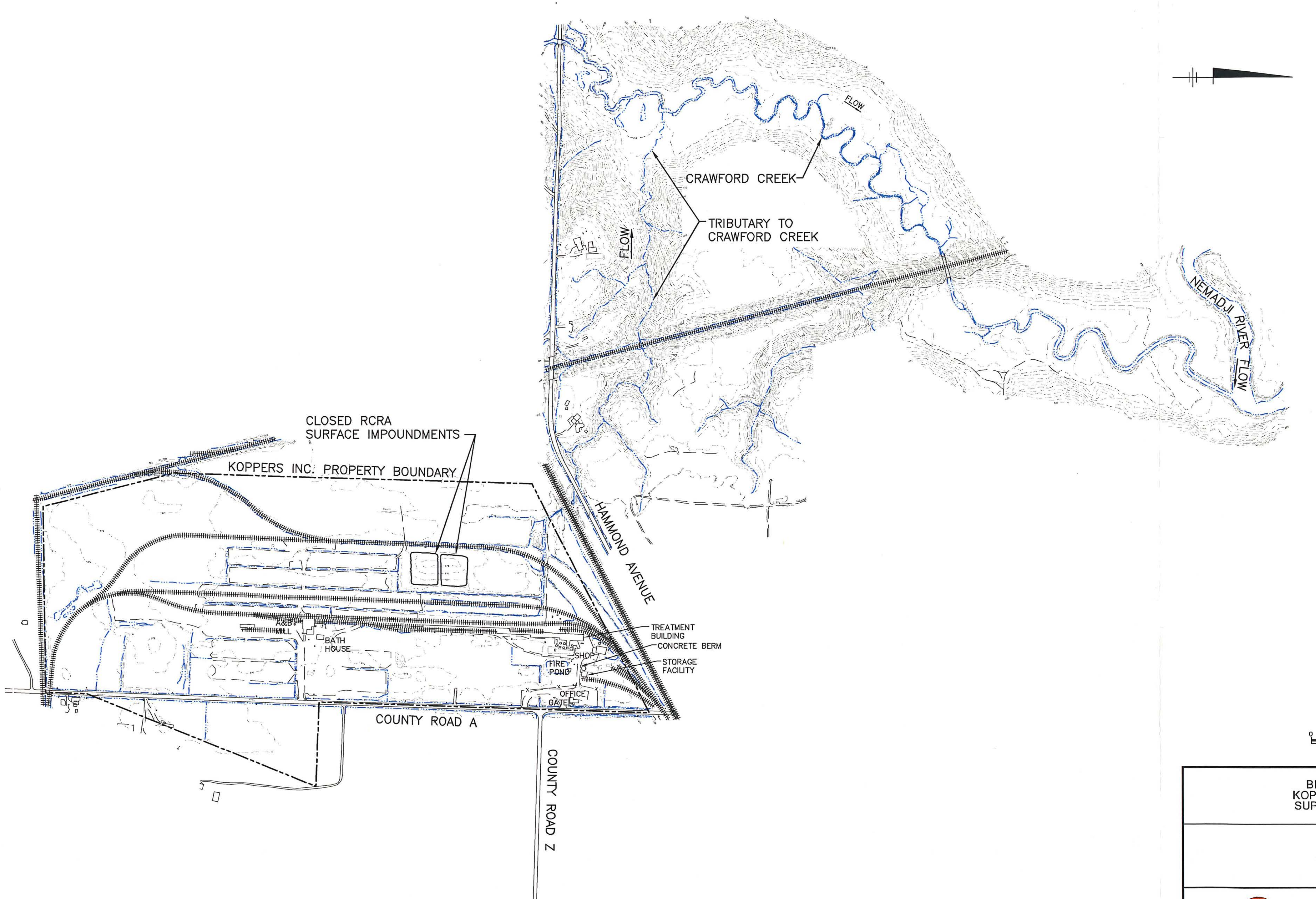
Beazer evaluated alternatives aimed at removing affected sediment and bank/floodplain soils. Removal is estimated to require excavation of at least 76,000 CY of soil/sediment along the Tributary and at least 121,000 CY of soil/sediment within the Crawford Creek floodplain. Removal at this scale was considered to be impracticable due to the factors cited in Section 2.4 above. Despite these limitations, and the impracticability of “complete” removal, opportunities for more limited and focused removal – or other enhancement of the recommended approach – may exist and represent an opportunity for an enhanced project in conjunction with GLNPO.

ARCADIS

Figures

CITY: SYRACUSE-NY DIV/GROUP: ENVCAD DB: K. DAVIS L. FORAKER PIC: R. ANDERSON PM: J. HOLDEN TM: H. EVANKO LYR: ON=*; OFF=REF* G:\ENVCAD\SYRACUSE\ACT\B0039243\0000\00002\DWG\CORRECTIVE\39243G02.DWG LAYOUT: 1 SAVED: 12/7/2011 9:54 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-LD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/7/2011 9:54 AM BY: FORAKER, LYDIA

XREFS: IMAGES: PROJECTNAME: ---
39243X01
39243X00
39243X02

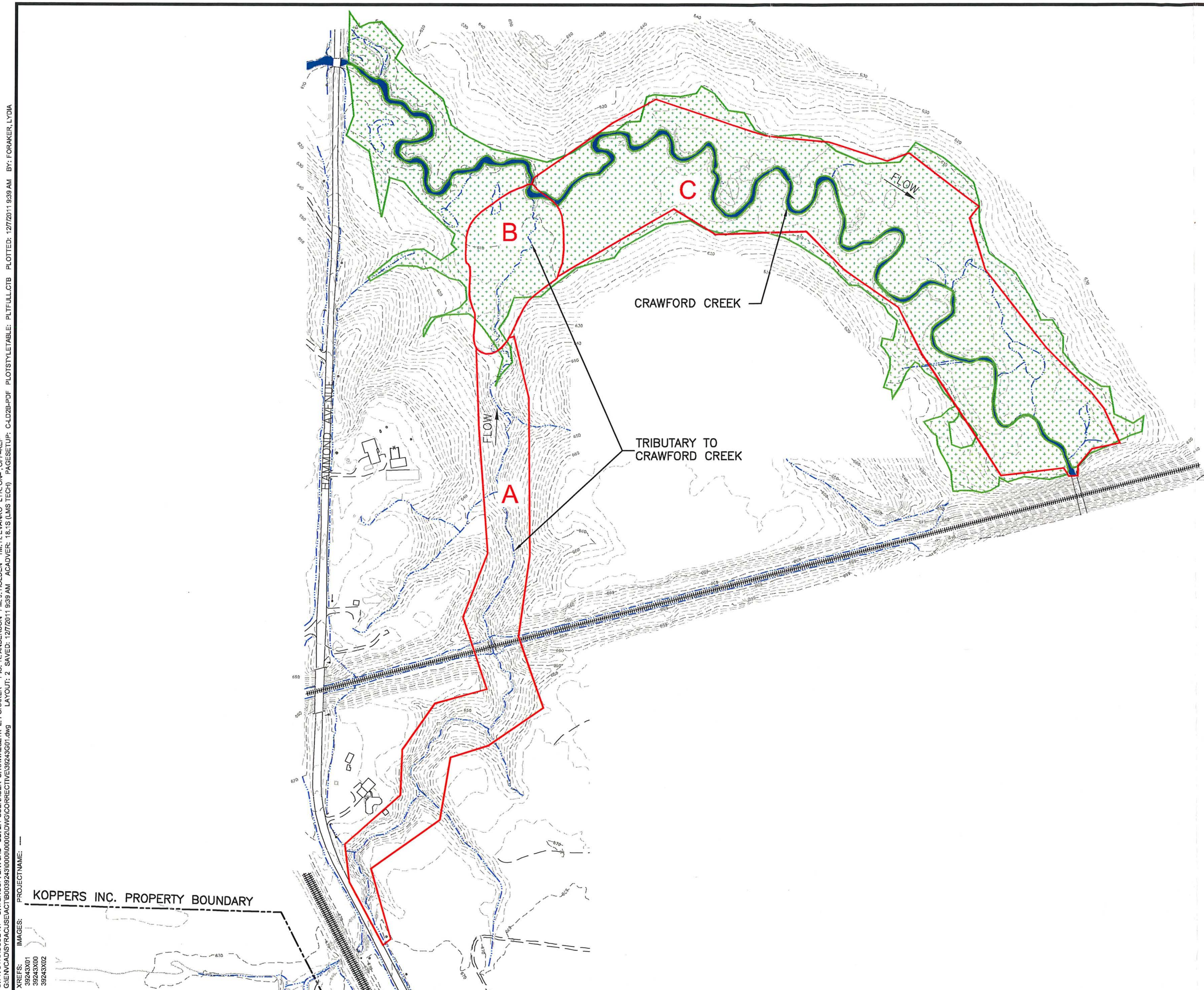


BEAZER EAST, INC.
KOPPERS INC. FACILITY
SUPERIOR, WISCONSIN

SITE PLAN

ARCADIS

FIGURE
1



LEGEND:

- CORRECTIVE ACTION AREA (SEE NOTE 2)
- IDENTIFIED WETLAND BOUNDARY (SEE NOTE 3)

NOTES:

1. BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LBH. INC. OF DULUTH, MN (2/9/09).
2. THE AREAS DEPICTED ON THIS FIGURE ARE INTENDED TO REPRESENT THE GENERAL CORRECTIVE ACTION AREAS AND DO NOT NECESSARILY REPRESENT THE LIMITS OF THE POTENTIAL CORRECTIVE ACTIONS, WHICH ARE MORE ACCURATELY SHOWN ON FIGURES 2-4. AREA A ENCOMPASSES SEDIMENTS AND BANK SOILS WITHIN THE TRIBUTARY TO CRAWFORD CREEK BETWEEN THE HAMMOND AVENUE AND THE CRAWFORD CREEK FLOODPLAIN. AREA B ENCOMPASSES SEDIMENTS AND FLOODPLAIN SOILS WITHIN AND ADJACENT TO THE PORTION OF THE TRIBUTARY TO CRAWFORD CREEK LOCATED WITHIN THE CRAWFORD CREEK FLOODPLAIN. AREA C ENCOMPASSES CRAWFORD CREEK SEDIMENTS FROM THE CONFLUENCE WITH THE TRIBUTARY TO CRAWFORD CREEK DOWNSTREAM TO THE RAILROAD EMBANKMENT.
3. IDENTIFIED WETLAND BOUNDARIES BASED ON GPS COORDINATES RECORDED DURING A DELINEATION BY ARCADIS IN OCTOBER 2008 AND SURVEY PERFORMED BY LHB IN OCTOBER/NOVEMBER 2008.

0 150' 300'
GRAPHIC SCALE

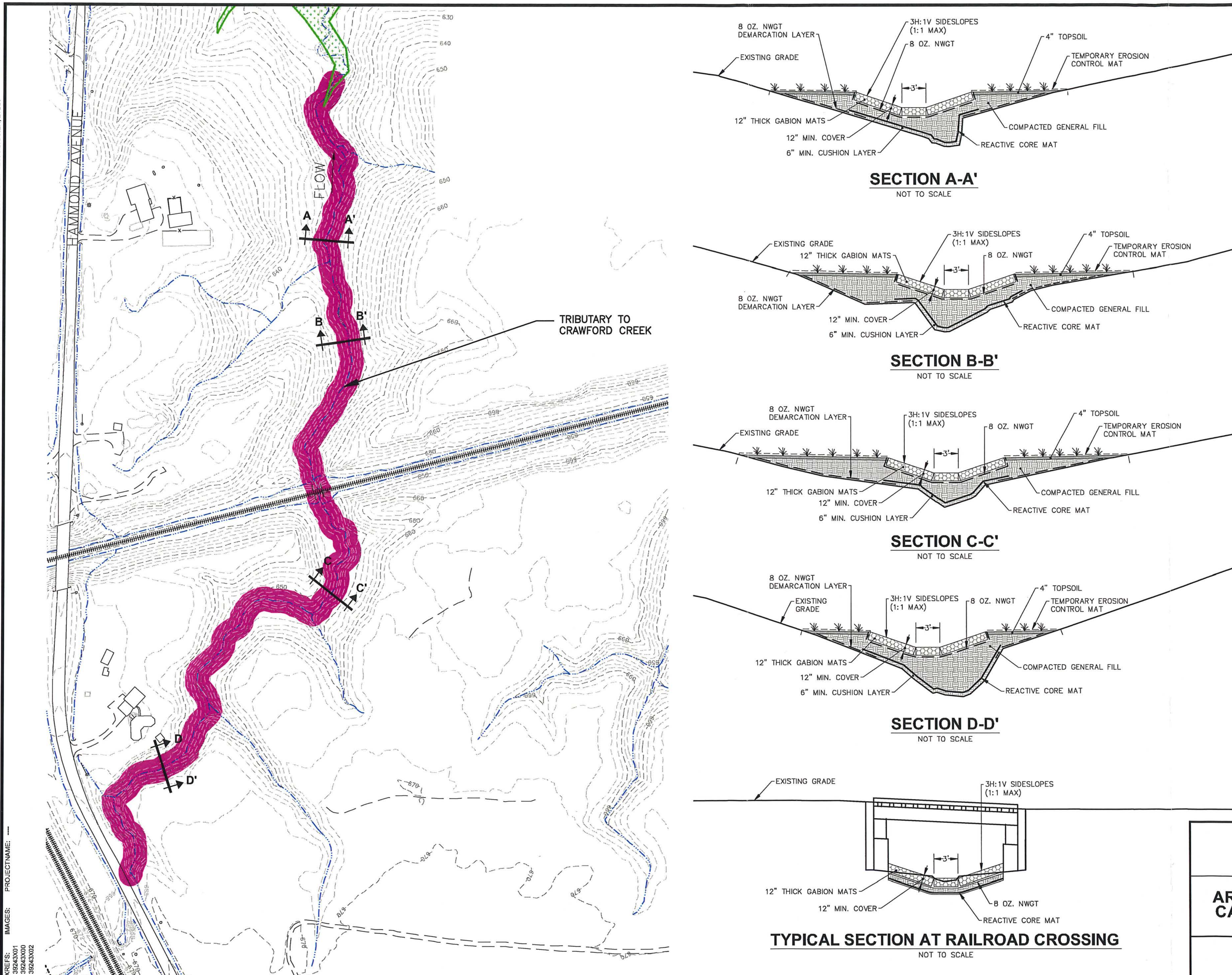
BEAZER EAST, INC.
KOPPERS INC. FACILITY
SUPERIOR, WISCONSIN

CORRECTIVE ACTION AREAS

ARCADIS

FIGURE
2

CITY: SYRACUSE-NY DIV/GROUP: ENVCAD DB: L. POSENAUER S. KAWALCZYK L. FORAKER PIC: R. ANDERSON PM: J. HOLDEN TM: H. EVANKO LYR: ON=*;OFF=REF*
G:\ENVCAD\SYRACUSE\ACT\B0039243\0000\00002\DWG\CORRECTIVE\39243G01.dwg LAYOUT: 2 SAVED: 12/7/2011 9:39 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-LD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/7/2011 9:39 AM BY: FORAKER, LYDIA
XREFS: 39243X01 39243X00 39243X02 IMAGES: PROJECTNAME: ---



LEGEND:

- EXTENT OF CORRECTIVE ACTION
- IDENTIFIED WETLAND BOUNDARY (SEE NOTE 2)

NOTES:

1. BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LBH. INC. OF DULUTH, MN (2/9/09).
2. IDENTIFIED WETLAND BOUNDARIES BASED ON GPS COORDINATES RECORDED DURING A DELINEATION BY ARCADIS IN OCTOBER 2008 AND SURVEY PERFORMED BY LHB IN OCTOBER/NOVEMBER 2008.
3. NWGT – NON-WOVEN GEOTEXTILE.

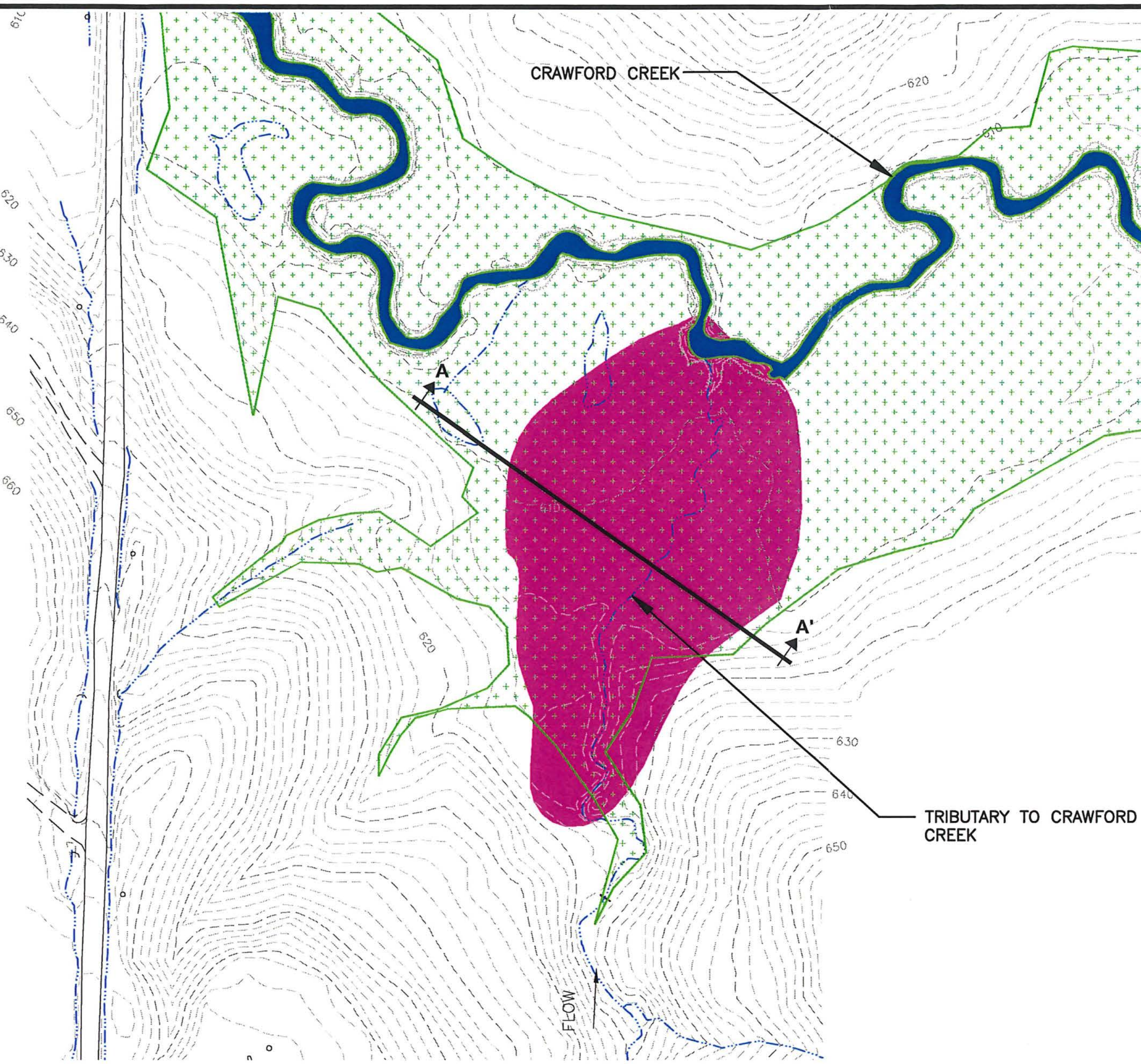
0 100' 200'
GRAPHIC SCALE

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

AREA A - SEDIMENT AND BANK SOIL CAPPING CONCEPTUAL APPROACH

ARCADIS

FIGURE
3



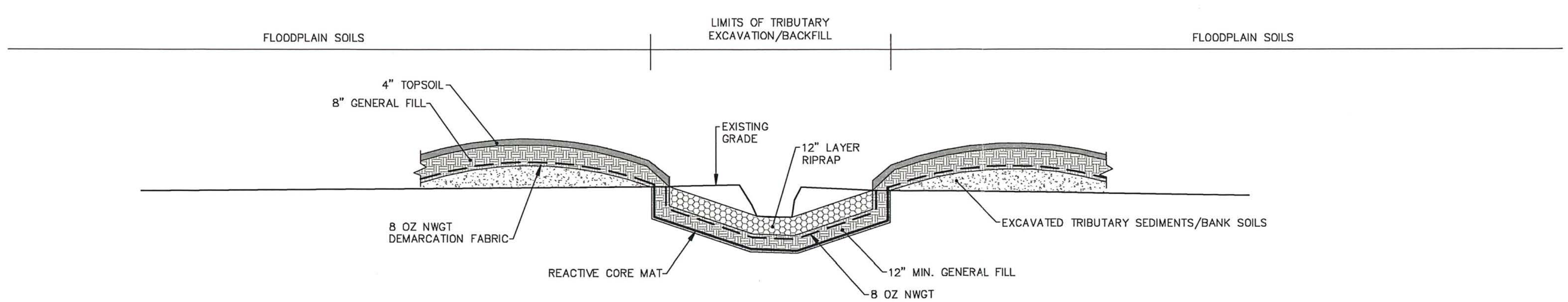
LEGEND:

- EXPOSURE AREA
- IDENTIFIED WETLAND BOUNDARY (SEE NOTE 2)

NOTES:

1. BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LBH. INC. OF DULUTH, MN (2/9/09).
2. IDENTIFIED WETLAND BOUNDARIES BASED ON GPS COORDINATES RECORDED DURING A DELINEATION BY ARCADIS IN OCTOBER 2008 AND SURVEY PERFORMED BY LHB IN OCTOBER/NOVEMBER 2008.
3. NWGT – NON-WOVEN GEOTEXTILE.
4. UNDER THIS ALTERNATIVE, ALL EXCAVATED TRIBUTARY SEDIMENTS AND BANK SOILS TO BE SPREAD OVER ADJACENT FLOOD PLAIN SOILS AND THEN COVERED.

0 80' 160'
GRAPHIC SCALE



SECTION A-A'
NOT TO SCALE

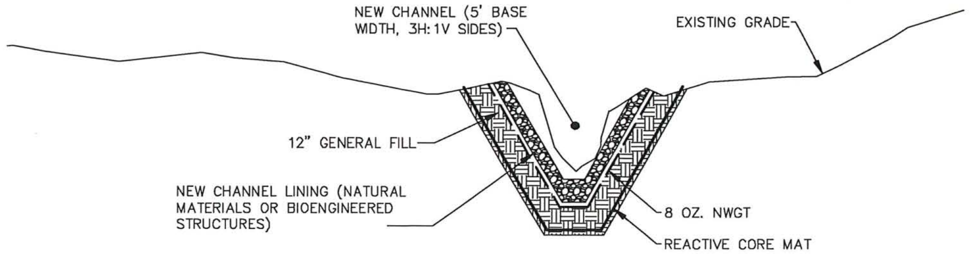
BEAZER EAST, INC.
KOPPERS INC. FACILITY
SUPERIOR, WISCONSIN

AREA B - SEDIMENT AND BANK SOIL REMOVAL AND FLOODPLAIN SOIL CAPPING CONCEPTUAL APPROACH

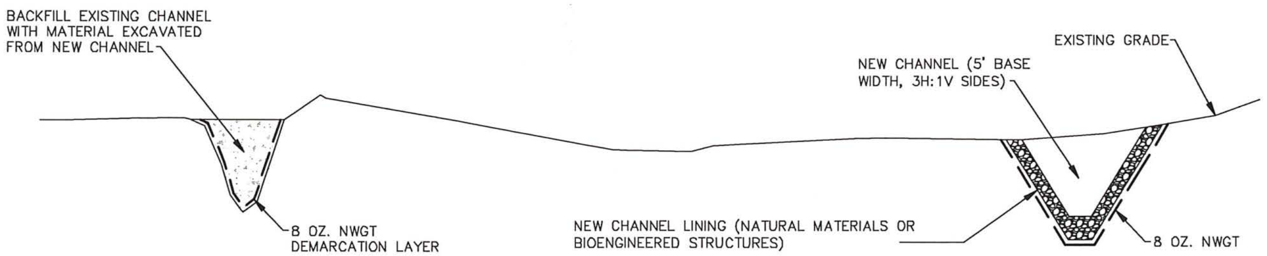
ARCADIS

FIGURE
4

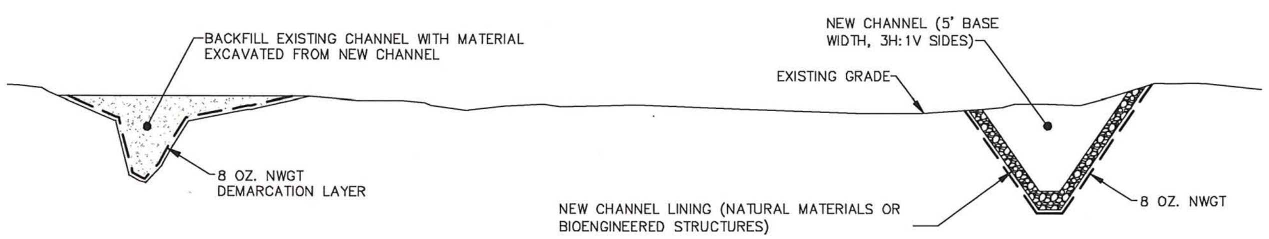
CITY: SYRACUSE-NY DIV/GROUP: ENVCAD DB: L.POSENAUER S.KAWALCZYK L.FORAKER PIC: R.ANDERSON PM: J.HOLDEN TM: H.EVANKO LYR: ON=*;OFF=REF*
G:\ENVCAD\SYRACUSE\ACT\B0039243\0000\00002\DWG\CORRECTIVE\39243V02.DWG LAYOUT: 4 SAVED: 12/7/2011 9:40 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-LD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/7/2011 9:40 AM BY: FORAKER, LYDIA
XREFS: 39243X01 39243X00 39243X02 IMAGES: PROJECTNAME: ---



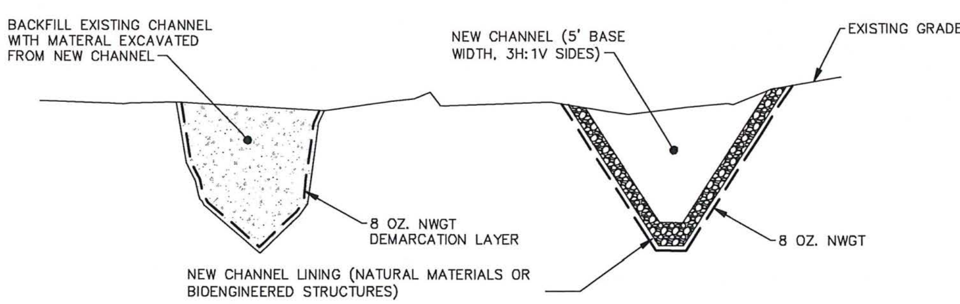
SECTION A-A'
NOT TO SCALE



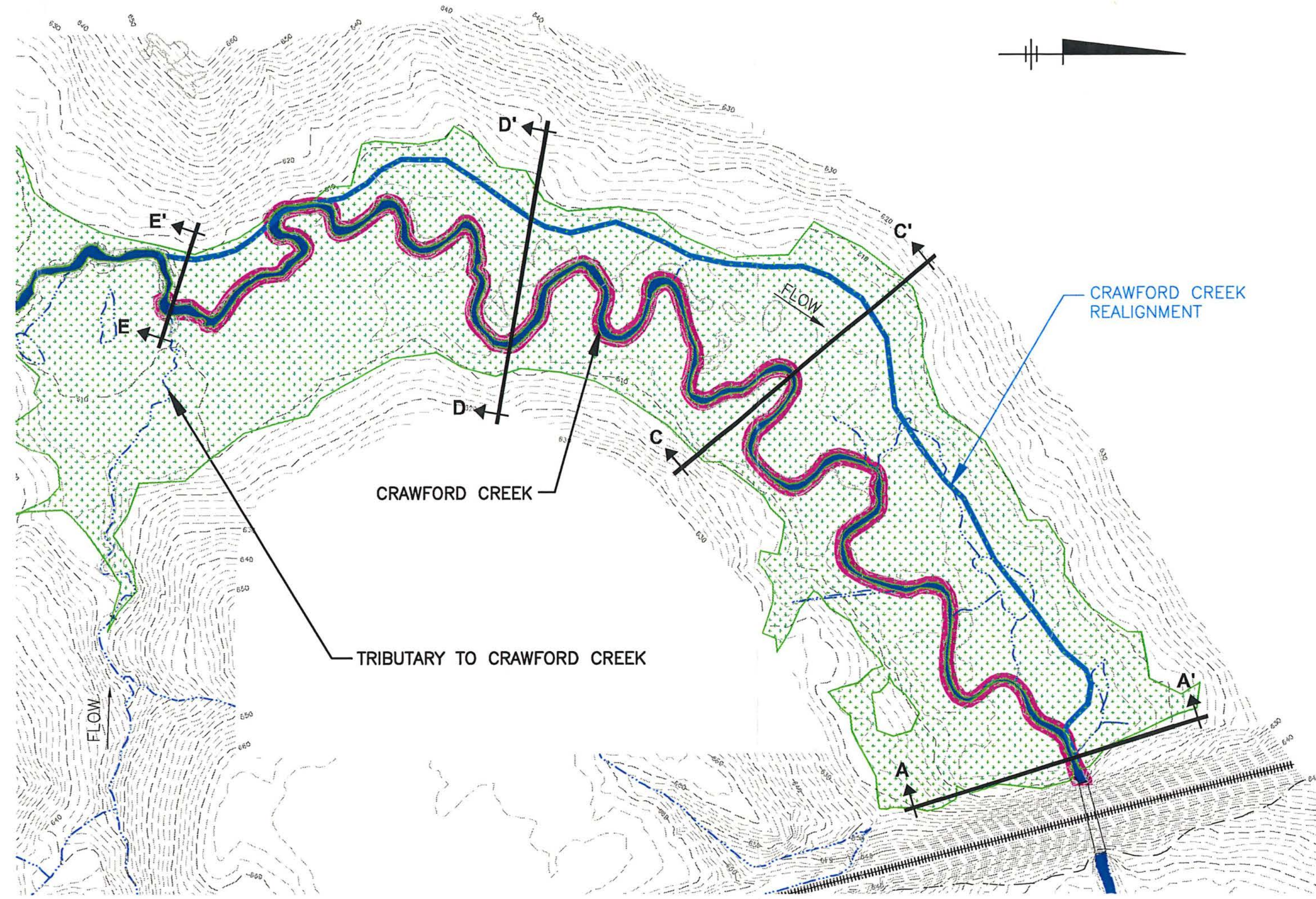
SECTION C-C'
NOT TO SCALE



SECTION D-D'
NOT TO SCALE



SECTION E-E'
NOT TO SCALE



LEGEND:

- CORRECTIVE ACTION AREA
- IDENTIFIED WETLAND BOUNDARY (SEE NOTE 2)

NOTES:

1. BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LBH. INC. OF DULUTH, MN (2/9/09).
2. IDENTIFIED WETLAND BOUNDARIES BASED ON GPS COORDINATES RECORDED DURING A DELINEATION BY ARCADIS IN OCTOBER 2008 AND SURVEY PERFORMED BY LHB IN OCTOBER/NOVEMBER 2008.
3. NWGT – NON-WOVEN GEOTEXTILE.
4. AT A MINIMUM, REACTIVE CORE MAT (RCM) WILL BE INSTALLED IN THE PORTION OF THE NEW CHANNEL WHERE IT CONNECTS TO THE EXISTING CRAWFORD CREEK CHANNEL.

0 150' 300'
GRAPHIC SCALE

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

AREA C - CHANNEL RELOCATION CONCEPTUAL APPROACH

ARCADIS

FIGURE
5

CITY: SYRACUSE-NY DIV/GROUP: ENVCAD DB: L. POSENAUER S. KAWALCZYK L. FORAKER PIC: R. ANDERSON PM: J. HOLDEN TM: H. EVANKO LYR: ON=*;OFF=REF*
G:\ENVCAD\SYRACUSE\ACT\B0039243\0000\00002\DWG\CORRECTIVE\39243V03.DWG LAYOUT: 5 SAVED: 12/7/2011 9:40 AM ACADVER: 18.1S (LMS TECH) PAGESETUP: C-LD2B-PDF PLOTSTYLETABLE: PLTFULL.CTB PLOTTED: 12/7/2011 9:40 AM BY: FORAKER, LYDIA
XREFS: 39243X01 39243X00 39243X02 IMAGES: PROJECTNAME: ---

ARCADIS

Attachment 1

Reactive Core Mat (RCM)
Cut Sheet

TECHNICAL DATA

REACTIVE CORE MAT®

with ORGANOCLAY®

DESCRIPTION

Organoclay® Reactive Core Mat® is a permeable composite of geotextiles and a non-swelling granular clay com-pound that reliably adsorbs oil and similar organics from water.

APPLICATION

Organoclay® Reactive Core Mat® (RCM) is designed for use in the following applications:

- In-situ subaqueous cap for contaminated sediments or post-dredge residual sediments
- Embankment seepage control
- Groundwater remediation

BENEFITS

- RCM provides a reactive material that treats contaminants which are carried by advective or diffusive flow
- Reactive cap allows for thinner cap thickness than a traditional sand cap
- Geotextiles provide stability and physical isolation

AVAILABILITY

Organoclay® Reactive Core Mat® is available from the following CETCO plant locations:

- 218 NE Industrial Park Rd., Cartersville, GA
- 92 Highway 37, Lovell, WY

Reactive Core Mat® is designed to provide a simple method of placing active materials into subaqueous sediment caps.

PACKAGING

- 15' by 100' rolls, packaged on 4" PVC core tubes wrapped with polyethylene plastic packaging.

TESTING DATA

PHYSICAL PROPERTIES		
PROPERTY	**TEST METHOD**	**RESULT**
ORGANOCLAY[1]		
Bulk Density Range	CETCO Test Method	44 - 56 lbs/ft^3
Oil Adsorption Capacity	CETCO Test Method	0.5 lb of oil per lb of organoclay, min
Quaternary Amine Content	CETCO Test Method	25 - 33% quaternary amine loading
FINISHED RCM PRODUCT		
Organoclay Mass per Area	CETCO Test Method	0.8 lb/ft^2
Mat Grab Strength[2]	ASTM D4632	90 lbs. MARV
Hydraulic Conductivity[3]	ASTM D4491	1×10^{-3} cm/sec minimum

NOTES:
[1] Organoclay properties performed periodically on material prior to incorporation into the RCM
[2] All tensile testing is performed in the machine direction
[3] Permittivity at constant head of 2 inches and converted to hydraulic conductivity using Darcy's Law and RCM thickness per ASTM D5199 for geotextiles