Table 1
Summary of Previous On-Property Investigations[1]
Koppers Inc. Facility
Superior, Wisconsin

Investigation	Date	Scope	Primary Findings/Conclusions	Reference
RFA/Phase I RFI	1987/1988	- Visual Site inspection - Soil sampling and analysis of 14 identified Solid Waste Management Units(SWMUs)	- Identified 14 SWMUs - Grouped SWMUs into eight areas of investigation: A — former unlined landfarm/landfill B — treatment area C — closed surface impoundments D — Outfall 001 E — Outfall 004 F — drip track area G — straw bales area H — lead track landfill	*RCRA Facility Assessment Report* (USEPA, 1988) *Phase I RFI Work Plan* (Keystone, 1989) *The RFA and Phase I RFI Work Plan are considered to be the Phase I RFI.
Phase II RFI	July to October 1990	- Soil sampling (borings and test pits) and analysis (SWMU areas) - Monitoring well installation, development and survey - Aquifer characterization (hydraulic conductivity) testing - Groundwater sampling and analysis (on-property monitoring wells) - Sediment and surface-water sampling and analysis (Outfalls 001 and 004)	- The primary COPCs for soils are PAHs and pentachlorophenol - Dioxins/furans detected, although the potentially carcinogenic 2,3,7,8-TCDD congener was not detected; presence of dioxins/furans expected to coincide with pentachlorophenol - Concentrations of COPC in soils generally decrease with depth (except for Areas C and H) - The extent of Site-related impacts to soil and groundwater are generally limited to the immediate vicinity of the various source areas - Groundwater samples collected from off-Site private (bedrock) wells did not contain COPCs - Site-specific CAOs were established for on-property soils - CMS recommended for on-property soils	*Phase II RCRA Facility Investigation, Report of Findings, Koppers Industries, Inc., Superior, Wisconsin* (Phase II RFI Report; Keystone, 1991)
Phase III RFI	October to December 1996	- Soil sampling (borings) and analysis (SWMU areas) - Monitoring well installation, development and survey - Groundwater sampling and analysis (Site monitoring wells, off-Site private wells and plant water-supply wells)		*RCRA Facility Investigation Report, Soil and Groundwater, Koppers Industries, Inc. Superior, Wisconsin Facility* (Phase III RFI Report; Fluor Daniel GTI, 1997b)
Surface Water and Streambed Sediment Investigation	June 1996	- Surface-water sampling and analysis (Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek) - Streambed sediment sampling and analysis (Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek) - Ditch bank soil sampling and analysis (Outfall 001 drainage ditch/Tributary to Crawford Creek) - Facility drainage mapping - Reconnaissance of the Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek	- Site-related impacts observed/detected within and along the Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek - Further evaluation of both the Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford creek was recommended to assess the need for and scope of remedial actions	*Preliminary Characterization Report, Surface Water and Streambed Sediment, Koppers Industries, Inc. Superior, Wisconsin Facility* (Fluor Daniel GTI, 1997a)

See notes on Page 3

Table 1
Summary of Previous On-Property Investigations[1]
Koppers Inc. Facility
Superior, Wisconsin

Investigation	Date	Scope	Primary Findings/Conclusions	Reference
Supplemental Surface Water and Streambed Sediment Investigation (primarily focused on "off-property" areas, but included investigation of a portion of the Outfall 001 drainage ditch addressed within this Focused CMS)	July to October 1999	- Mapping and field reconnaissance - Sediment and floodplain soil probing and bathymetric survey (Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek) - Sediment and floodplain soil sampling and analysis (geotechnical, geochronological and chemical) (Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek) - Surface-water flow measurements, sampling and analysis (Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek) - Ecological investigation — habitat evaluations, endangered species/critical habitat identification, benthic macroinvertebrate survey and fish survey (Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek)	- Site-related impacts were observed/detected within and along the Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek (upstream of the railroad crossing) - Ecological surveys did not indicate Site-related impacts to plants or animals - Site-specific CAOs for the Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek were identified	*Supplemental Surface Water and Streambed Sediment Investigation Report* (BBL, 2000b)
Supplemental Field Investigations in accordance with July 25, 2001 Work Plan	December 2001	- Fire pond sediment probing, sampling and analysis - Former penta storage tank area soil sampling and analysis	- Low levels of dioxins/furans and PAHs were detected in fire pond sediment samples (pentachlorophenol was not detected) - Low levels of dioxins/furans were detected in the former penta storage tank area soil sample	Letter from BBL to the WDNR dated April 12, 2002 (BBL, 2002a)
Bedrock Groundwater Monitoring	October/November 1999 February 2000 June 2001 July/August 2001 Apr. and Oct. 2002 Apr. and Oct. 2003 Apr., July and Oct. 2004 Apr. and Oct. 2005 Apr. and Oct. 3006 Apr. 2007	- Installed three bedrock groundwater monitoring wells (W-18D, W-33D, W-34D) - 15 rounds of monitoring (water-level measurement, sampling and analysis) at one or more of the three bedrock wells	- Generally decreasing concentrations of COPCs since wells were initially installed - No recent exceedences of WDNR Enforcement Standards (ESs) - Periodic marginal exceedences of WDNR Preventive Action Limits (PALs) for pentachlorophenol in W-18D - Limited potential for off-Site migration of COPC in bedrock groundwater at concentrations exceeding WDNR standards	*RFI Bedrock Monitoring Wells Report* (BBL, 2000c) Letters from BBL to the WDNR dated November 28, 2000; September 21, 2001; April 18, 2003 (BBL, 2003a), and April 19, 2004 Letter from BBL to the WDNR dated January 26, 2006 2006 RCRA Annual Groundwater Monitoring Reports (FTS, 2007a) First 2007 Semi-annual Monitoring Report (FTS, 2007b)

See notes on Page 3

Table 1
Summary of Previous On-Property Investigations[1]
Koppers Inc. Facility
Superior, Wisconsin

Investigation	Date	Scope	Primary Findings/Conclusions	Reference
Additional Outfall 001 Drainage Ditch Investigation	May 2003	- Visual characterization of manually recovered materials from within and adjacent to the Outfall 001 drainage ditch/Tributary to Crawford Creek	- Visibly impacted materials (e.g., discrete occurrences of oily product in isolated clay fractures) were observed along the Outfall 001 drainage ditch at depths of up to 4.75 feet bgs and extending up to 26 feet laterally from the channel	Letter from BBL to the WDNR dated October 2, 2003
Additional On-Property Soil Sampling	April 2005 September 2005	- Soil sampling and analysis (SWMU areas)	- Data used to modify Human Health Risk Assessment (HHRA) calculations	Letter from BBL to the WDNR dated February 22, 2006 (BBL, 2006c)
Supplemental Groundwater Monitoring/Natural Attenuation Evaluation	July 2004 to April 2005	- Sampled selected existing monitoring wells for various natural attenuation indicator parameters - Conducted various natural attenuation evaluations with dataset	- COPC concentrations in groundwater are generally stable or decreasing - Data for various natural attenuation indicator parameters are consistent with the occurrence of biodegradation and natural attenuation	Letters from BBL to the WDNR dated January 24, 2006 and April 27, 2006
Supplemental Outfall 001 Drainage Ditch and Crawford Creek Investigation (primarily focused on "off-property" areas, but included investigation of a portion of the Outfall 001 drainage ditch addressed within this Focused CMS)	April to December 2005	- Reconnaissance/probing of the Outfall 001 drainage ditch/Tributary to Crawford Creek - Soil borings/test pits along the Outfall 001 drainage ditch/Tributary to Crawford Creek - Installation and monitoring of piezometers and surface-water gauges along the Outfall 001 drainage ditch/Tributary to Crawford Creek and Crawford Creek - Collection and analysis of sediment, surface water sheen and fish samples from Crawford Creek - Collection and analysis of soil and insect samples from the Crawford Creek floodplain	- Sufficient data and an understanding of Site conditions exist to proceed with human health and ecological risk characterizations	*Off-Property Investigation Data Summary Report* (BBL, 2006b)
Additional On-Property Soil Sampling	October 2006 November 2006	- Soil sampling and analysis (SWMU areas)	- Data used to modify Post-Remediation HHRA calculations and refine corrective action limits	Transmittal from ARCADIS BBL to the WDNR dated March 27, 2007
Additional Supplemental Groundwater Investigations	October 2006 to June 2007	- Installation of six new A-zone monitoring wells - Groundwater sampling and analysis at six new wells and selected existing wells	- Data being used to further support the natural attenuation-based approach for groundwater	Report in preparation
KI Drip Pad Closure Investigation	November 2006 April 2007	- Collection and analysis of six surficial soil samples - Installation of two temporary monitoring wells - Collection and analysis of groundwater samples from the temporary monitoring wells	- Soil and groundwater sample data consistent with existing soil and groundwater sample data collected during the RFI and subsequent investigations - Soil data used for revised HHRA calculations	Letter from KI to WDNR dated January 18, 2007 (KI, 2007a) Letter from KI to the WDNR dated May 16, 2007 (KI, 2007b)

Notes:
COPCs = Constituents of potential concern
CAOs = Corrective action objectives
RFA = RCRA facility assessment
RFI = RCRA facility investigation
1. This table summarizes previous Site investigations involving those portions of the Site addressed within the Focused CMS Report for on-property areas.

Table 2
Technology Screening Summary — On-Property Soils
Koppers Inc. Facility
Superior, Wisconsin

General Response Action	Corrective Action Technology	Process Option	Description	Screening Result
Institutional Controls	Institutional Controls	Land use restrictions, access restrictions, signs	Institutional controls could include legal, administrative and/or physical controls that mitigate the potential for exposure to or disturbance of targeted on-property soils. Examples of potential institutional controls include land use restrictions, access restrictions (e.g., fencing) and/or posting of signs.	Retained. Applicable for all Site conditions and consistent with NR 720.11.
Monitoring	Monitoring	Sampling and analysis, field observations	Depending on the nature of the selected alternative, monitoring could involve collection and analysis of samples to determine the effectiveness of engineering controls, performance of visual reconnaissance to track site conditions and remedy integrity after implementation is complete, or other similar monitoring-related measures to verify the continued effectiveness of the corrective action.	Retained. Applicable for all Site conditions and consistent with the range of other retained technologies.
In-Situ Containment	Surface Cover	Asphalt, soil, clay, gravel, etc.	Installing a surface cover would include placement of asphalt, clay, soil and/or similar material over on-property soils targeted for corrective action. The cover materials would be selected based on intended use of the targeted area and its current surface type. The cover would serve as a barrier to direct contact with, erosion of, or migration of impacted soils.	Retained. Applicable to Site-specific soil and Site use conditions; mitigates direct contact to surface soils by potential receptors as necessary to achieve risk-based objectives.
	Engineered Cap	Multilayer/multimedia engineered cap	Constructing an engineered cap would include placement of multiple layers of select materials over on-property soils targeted for corrective action. The layers typically include various materials such as low-permeability synthetic membranes (e.g., high-density polyethylene [HDPE] liners), drainage layers, soil and/or clay, asphalt, concrete, and/or vegetated topsoil. Depending on site- and constituent-specific goals, an engineered cap can achieve physical, chemical and biological isolation and erosion control, minimize infiltration, promote runoff, mitigate volatilization to ambient air, provide freeze/thaw protection, and provide for other site goals.	Not retained. The additional features of an engineered cap (relative to a surface cover) are not necessary to achieve CAOs. Therefore, the surface cover is the representative in-situ containment option retained for further consideration.
In-Situ Treatment	Bioremediation Immobilization Chemical Thermal	Natural/enhanced biodegradation, stabilization/solidification, chemical extraction, etc.	Various in-situ treatment technologies, including those listed at left, are frequently considered for the constituents of potential concern (COPCs) identified for this Site. These technologies are applied to soils without removing the soils from their present location. This is typically achieved through adding and mixing chemical reagents, adding or enhancing the biodegradation catalysts (e.g., oxygen, nutrients), heating, or other technology-specific applications.	Not retained based on Beazer's experience at numerous other similar sites, climatic considerations, typically high costs, proximity to active operations, shallow groundwater presence and other Site-specific considerations (e.g., clayey soils).

See notes on Page 2

Table 2
Technology Screening Summary — On-Property Soils
Koppers Inc. Facility
Superior, Wisconsin

General Response Action	Corrective Action Technology	Process Option	Description	Screening Result
Removal	Excavation	Excavation	This technology involves physical removal of on-property soils targeted for corrective action. Typical excavation equipment includes backhoes, excavators, loaders and/or dozers. Excavated materials are then managed using one or more other technologies (e.g., ex-situ treatment, on- or off-site disposal).	Retained. Applicable for targeted soil areas (i.e., shallow, unsaturated soils). May require use of manual removal adjacent to existing facilities and structures.
Ex-Situ Treatment (on site or off site)	Biodegradation Immobilization Chemical Thermal	Enhanced biodegradation, stabilization/solidification, chemical extraction, incineration	Various ex-situ treatment technologies, including those listed at left, are frequently considered for the COPC identified for this Site. These technologies are applied to soils that have been removed from their present location. The materials are then processed to apply the selected technology, which can be achieved either on site or at a permitted off-site treatment facility. Based on site- and constituent-specific considerations, soils would likely require disposal at an off-site commercial land disposal facility.	Not retained based on Beazer's experience at numerous other similar sites, climatic considerations, typically high costs and other Site-specific considerations.
Disposal	On Site	On-site consolidation in Corrective Action Management Unit (CAMU)	Excavated soils could be consolidated in an engineered containment cell within a designated on-site CAMU. The engineered containment cell includes provisions (e.g., surface cover, institutional controls) to mitigate the potential for exposure to or migration of consolidated materials.	Retained. A CAMU has been proposed to and conceptually approved by the WDNR (WDNR, 2000). Consolidation in a containment cell is applicable for materials to be excavated at the Site and is a proven and frequently used approach.
	Landfill	Off-site Commercial Facility	Excavated soils could be consolidated on site and transported to an off-site permitted landfill for disposal. Depending on constituent concentrations, land disposal in the USA would likely require treatment (e.g., incineration) prior to disposal to meet RCRA land disposal restrictions. Treatment would not be required for land disposal in Canada.	Retained. Off-Site disposal at a commercial facility is applicable to the types of materials to be excavated at the Site and is a proven and frequently used approach.

Notes:
1. This screening table focuses on a limited range of response actions and technology types considered most applicable for this Site based on Site-specific information, Beazer's experience at other wood-treating sites and previous coordination with the WDNR. The screening was performed based upon Site- and technology-specific considerations.
2. Shading indicates that the remedial technology has not been retained for further evaluation.

Table 3
Technology Screening Summary — Outfall 001 Drainage Ditch
Koppers Inc. Facility
Superior, Wisconsin

General Response Action	Corrective Action Technology	Process Option	Description	Screening Result
Institutional Controls	Institutional Controls	Land use restrictions, access restrictions, signs	Institutional controls could include legal, administrative and/or physical controls that mitigate the potential for exposure to or disturbance of targeted drainage ditch materials. Examples of potential institutional controls include land use restrictions, access restrictions (e.g., fencing) and/or posting of signs.	Retained. Applicable for all Site conditions and consistent with NR 720.11
Monitoring	Monitoring	Sampling and analysis, field observations	Depending on the nature of the selected alternative, monitoring could involve the collection and analysis of samples to determine the effectiveness of engineering controls, performance of visual reconnaissance to track Site conditions and remedy integrity after implementation is complete, or other similar monitoring-related measures to verify the continued effectiveness of the corrective action.	Retained. Applicable for all Site conditions and consistent with the range of other retained technologies.
In-Situ Containment/ Isolation	Physical Barrier	Surface Cover	Installing a surface cover would include placement of asphalt, clay, soil and/or similar material over the on-property portion of the Outfall 001 drainage ditch. The cover would serve as a barrier to direct contact with, erosion of, or migration of impacted materials.	Not retained. May not provide a suitable barrier to potentially mobile NAPL (if present) and other options that are more effective and implementable at this Site are available.
		Engineered Cap	Constructing an engineered cap would include placement of multiple layers of select materials over the on-property portion of the Outfall 001 drainage ditch. The layers typically include various materials such as low-permeability synthetic membranes (e.g., HDPE liners), drainage layers, soil and/or clay, asphalt, concrete, and/or vegetated topsoil. Depending on site- and constituent-specific goals, an engineered cap can achieve physical, chemical and biological isolation and erosion control, minimize infiltration, promote runoff, mitigate volatilization to ambient air, provide freeze/thaw protection and provide for other site goals.	Retained. Implementable and could achieve Site-specific CAOs. Potentially effective method to mitigate NAPL migration. Would require limited soil removal to offset volume of cap materials and maintain hydraulic conveyance capacity.

See notes on Page 3.

Table 3
Technology Screening Summary — Outfall 001 Drainage Ditch
Koppers Inc. Facility
Superior, Wisconsin

General Response Action	Corrective Action Technology	Process Option	Description	Screening Result
In-Situ Containment/ Isolation (Cont.)	Physical Barrier (Cont.)	Sheetpile Wall, Slurry Wall	Install a vertical barrier to fully or partially encompass potentially mobile zones of Site-related constituents to contain/control potential discharge to the ditch and/or off-site migration. The physical barrier could be designed to be permeable or impermeable to groundwater flow, depending on hydrogeologic characteristics and barrier objectives.	Not retained due to the low-permeability nature of existing soils, potential need for installation of a long-term pump and treat system to maintain/control groundwater hydraulics altered by installation of a physical barrier, and the availability of other options that are more readily implementable at this Site.
		Culverting	Install culvert piping and bedding materials along targeted portion of drainage ditch so that water flows in the culvert instead of through open channel flow. This prevents erosion of potentially impacted channel bottom materials and migration of Site-related constituents from the underlying soils to the surface water.	Retained. Implementable and achieves Site-specific CAOs.
	Relocation	Channel Relocation	Excavate a new channel through an unimpacted area and backfill the existing channel. Typical excavation and backfilling equipment includes backhoes, excavators, loaders and/or dozers. Potentially impacted materials along the existing channel would be contained beneath the fill material used to backfill the channel.	Retained. This approach would achieve Site-specific CAOs. Technical issues associated with constructing new ditch route (e.g., need to cross railroad track) exist, but may be overcome through planning and engineering design.
In-Situ Treatment	Bioremediation Immobilization Chemical Thermal	Natural/enhanced biodegradation, stabilization/solidification, chemical extraction, etc.	Various in-situ treatment technologies, including those listed at left, are frequently considered for the COPCs identified for this Site. These technologies are applied to impacted materials without removing the materials from their present location. This is typically achieved through adding and mixing chemical reagents, adding or enhancing the biodegradation catalysts (e.g., oxygen, nutrients), heating, or other technology-specific applications.	Not retained based on Beazer's experience at numerous other similar sites, climatic considerations, typically high costs, proximity to active operations, shallow groundwater and surface-water presence, and other Site-specific considerations (e.g., clayey soils). Also, treatment of these materials is not necessary to achieve CAOs for this area.
Soil/Sediment Removal	Excavation	Excavation	This technology involves physical removal of drainage ditch materials targeted for remedial action. Typical excavation equipment includes backhoes, excavators, loaders and/or dozers. Excavated materials are then managed using one or more other technologies (e.g., ex-situ treatment, on- or off-site disposal).	Retained. Excavation of ditch and/or adjacent materials could be a component of an approach to achieve CAOs, and is implementable.

See notes on Page 3.

Table 3
Technology Screening Summary — Outfall 001 Drainage Ditch
Koppers Inc. Facility
Superior, Wisconsin

General Response Action	Corrective Action Technology	Process Option	Description	Screening Result
NAPL Removal	NAPL Collection	Collection Trench	Given Site-specific conditions, measures could be implemented to conservatively address the observed presence of creosote-like product (NAPL) in soils adjacent to the ditch to reduce its potential for migration into the ditch. Based on the low-permeability nature of Site soils and limited vertical extent of observed NAPL, collection of any potentially mobile shallow NAPL would require the construction of a high-permeability trench. To the extent that any NAPL may be potentially mobile, such material entering the trench would settle to the bottom where it could be collected (e.g., through piping and/or sumps) and removed.	Retained. Removal of any potentially mobile NAPL in the vicinity of the ditch could facilitate achievement of CAOs for the ditch. Trench is readily constructable given shallow nature of subsurface impacts.
Ex-Situ Treatment (on site or off site)	Biodegradation Immobilization Chemical Thermal	Enhanced biodegradation, stabilization/solidification, extraction, incineration	Various ex-situ treatment technologies, including those listed at left, are frequently considered for the COPCs identified for this Site. These technologies are applied to impacted materials that have been removed from their present location. The materials are then processed to apply the selected technology, which can be achieved either on site or at a permitted off-site treatment facility. Based on Site- and constituent-specific considerations, materials would likely require disposal at an off-site commercial land disposal facility.	Not retained based on Beazer's experience at numerous other similar sites, climatic considerations, typically high costs, and other Site-specific considerations (e.g., clayey soils).
Disposal	On Site	On-site consolidation in Corrective Action Management Unit (CAMU)	Excavated drainage ditch materials could be consolidated in an engineered containment cell within a designated on-site CAMU. The engineered containment cell includes provisions (e.g., surface cover, institutional controls) to mitigate the potential for exposure to or migration of consolidated materials.	Retained. A CAMU has been proposed to and conceptually approved by the WDNR (WDNR, 2000). Consolidation in a containment cell is applicable for materials to be excavated at the Site and is a proven and frequently used approach.
	Landfill	Off-site Commercial Facility	Excavated materials could be consolidated on site and transported to an off-site permitted landfill for disposal. Depending on constituent concentrations, land disposal in the USA would likely require treatment (e.g., incineration) prior to disposal to meet RCRA land disposal restrictions. Treatment would not be required for land disposal in Canada.	Retained. Off-site disposal at a commercial facility is applicable to the types of materials to be excavated at the Site and is a proven and frequently used approach.

Notes:
1. This screening table focuses on a limited range of response actions and technology types considered most applicable for this Site based on Site-specific information, Beazer's experience at other wood-treating sites and previous coordination with the WDNR. The screening was performed based upon Site- and technology-specific considerations.
2. Shading indicates that the remedial technology has not been retained for further evaluation.

Table 4
Summary of Corrective Action Alternative Preliminary Cost Estimates
Koppers Inc. Facility
Superior, Wisconsin

On-Property Soil Alternatives
Alternative S-1: Surface Cover
Alternative S-2: Excavation with Placement in an Onsite CAMU
Alternative S-3: Excavation with Disposal at an Offsite Commercial Facility

Outfall 001 Drainage Ditch Alternatives
Alternative D-1: Culverting the Existing Ditch
Alternative D-2: Excavation and Disposal of Drainage Ditch Materials
Alternative D-3: Ditch Relocation with DNAPL Migration Control Measures

Cost Components	Alternative S-1	Alternative S-2	Alternative S-3	Alternative D-1	Alternative D-2	Alternative D-3	Groundwater Nat. Attenuation
Indirect Costs [2]	$180,000	$202,500	$202,500	$129,000	$157,000	$162,500	$69,000
CAMU Construction, Operation, and Maintenance [4]	--	$2,213,000	--	--	--	--	--
Construction/Capital Costs (includes 25% contingency)	$1,443,198	$2,004,550	$2,004,550	$202,600	$555,664	$413,775	$31,250
Transportation and Disposal Costs (includes 25% contingency) [3]	$25,000	$402,500	$10,934,375	$12,000 - $170,313	$93,750 - $2,490,625	$8,000 - $41,031	--
Operation and Maintenance Costs (present worth) [4]	$48,027	$7,860	$7,860	$24,055	$7,860	$18,657	$0
Total Costs (rounded) [5]	$1,696,000	$4,830,000	$13,150,000	$368,000 - $526,000	$815,000 - $3,212,000	$603,000 - $636,000	$100,000

Notes:
1. Refer to Tables B-1 through B-8 in Appendix B for detailed preliminary cost estimates.
2. Indirect costs for all alternatives include alternative-specific institutional controls, pre-design investigation activities, and administration/engineering fees (engineering design, construction oversight, and reporting).
3. For alternatives where a range of transportation and disposal costs is provided, the low end cost assumes consolidation of excavated materials in an onsite CAMU, and the high end cost assumes transportation to and disposal of excavated at the Clean Harbors "Sarnia" facility in Corunna, Ontario, Canada.
4. For Alternatives S-1, S-2, and S-3, inspection and maintenance activities are assumed to occur for 30 years, 3 years, and 3 years, respectively. For the CAMU, inspection and maintenance activities are assumed to occur for 30 years and leachate collection/treatment is assumed to occur for 10 years. For Alternatives D-1 and D-3, inspections are assumed to occur for 3 years and maintenance activities are assumed to occur for 30 years. For Alternative D-2, both inspection and maintenance activities are assumed to occur for 3 years. Inspection and monitoring periods are for CMS evaluation purposes only; actual durations may vary.
5. Total costs do not include establishing "baseline" institutional controls (e.g., industrial land use restrictions, groundwater use restrictions), which would apply regardless of the alternatives selected. The cost of establishing "baseline" institutional controls is estimated to be approximately $20,000.

Table 5
Summary of Comparative Evaluation of Corrective Action Alternatives[1]
Koppers Inc. Facility
Superior, Wisconsin

Evaluation Criterion[2]	Alternatives for On-Property Soil			Alternatives for the On-Property Portion of the Outfall 001 Drainage Ditch		
	Alternative S-1 Surface Cover	**Alternative S-2** Excavation with Placement in On-site CAMU	**Alternative S-3** Excavation with Disposal at an Off-site Commercial Facility	**Alternative D-1** Culverting the Existing Ditch	**Alternative D-2** Excavation and Disposal of Drainage Ditch Materials	**Alternative D-3** Ditch Relocation with DNAPL Migration Control Measures
Long-Term Effectiveness	4	4	5	4	5	4
Short-Term Effectiveness	4	2	3	4	2	4
Implementability	4	4	5	4	2	2
Restoration Time Frame	5	3	4	4	4	4
Economic Feasibility	5	3	1	5	1	5
Compliance with Environmental Laws, Standards and Permits	5	5	5	5	5	5
Total Score	**27**	**21**	**23**	**26**	**19**	**24**

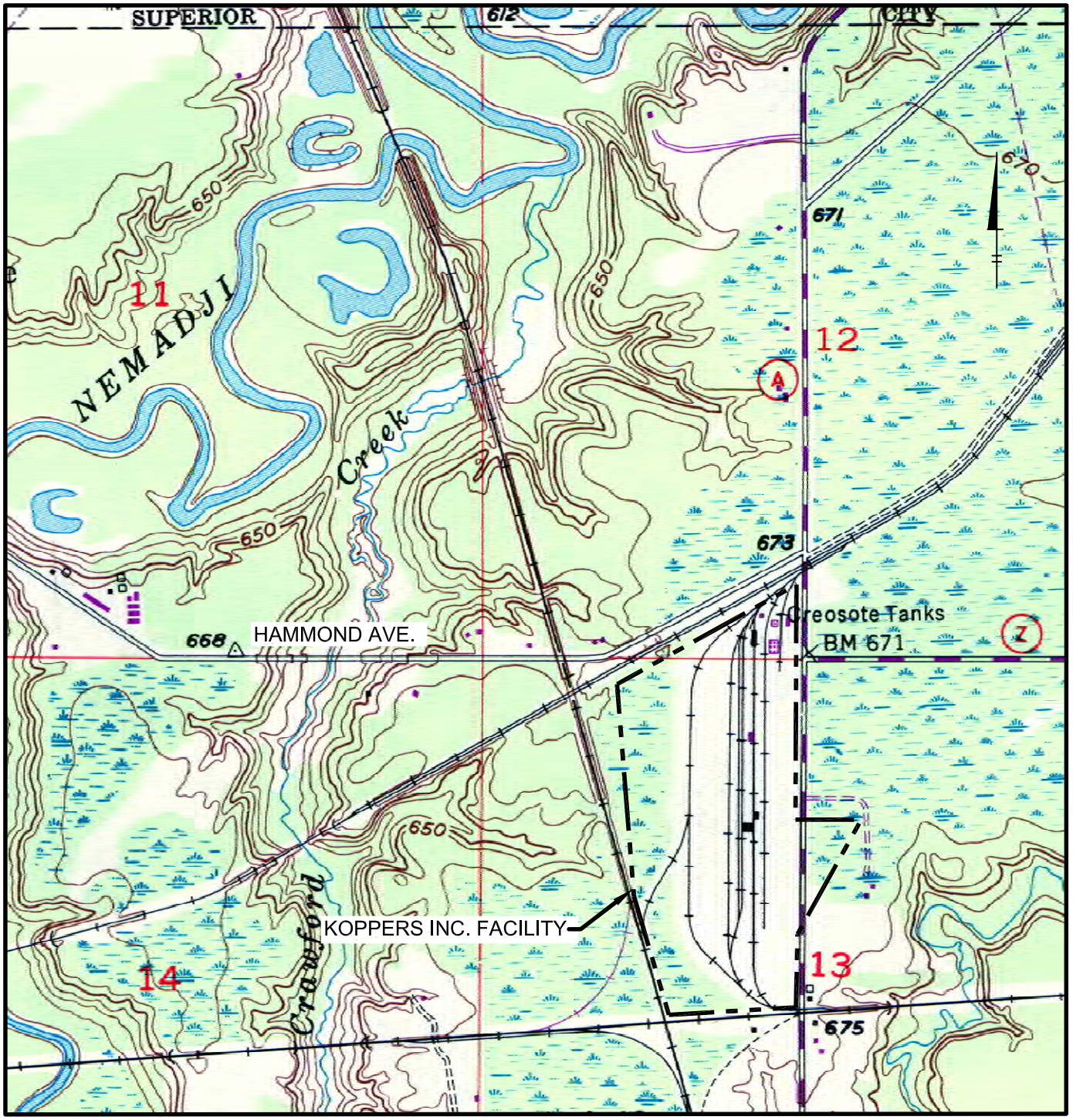
Notes:
1. Each alternative was assigned a score ranging from 1 to 5 for each criterion, with 1 representing the low end of the performance scale and 5 representing the high end. The scores are intended to reflect the relative comparisons among the alternatives considered, as well as the extent to which an alternative satisfies each criterion.
2. Evaluation criteria are described in Section 6.2 of the Focused CMS Report.

Table 6
Potentially Applicable Environmental Laws, Standards and Permits
Koppers Inc. Facility
Superior, Wisconsin

Requirements	Citation	Description
Federal		
Resource Conservation and Recovery Act (RCRA)	42 USC 6901-6992k	
Corrective Action Management Unit[1]	40 CFR 264.552	Establishes the requirements for use of a CAMU to support the implementation of corrective action activities.
Land Disposal Requirements	40 CFR 268	Defines disposal requirements for RCRA-listed F032 and F034 wastes.
State		
Wisconsin State Environmental Protection — General:	NR 100	
Water Quality Standards for Wetlands	NR 103	Establishes water-quality standards for wetlands.
Nonmetallic Mining Reclamation	NR 135	Establishes applicable standards, procedures and requirements for mining permit applications, reclaiming nonmetallic sites, nonmetallic mining reclamation programs and landowner registration of marketable nonmetallic mineral deposits (potentially applicable in the event a local borrow source is established).
Groundwater Quality	NR 140	Establishes groundwater quality standards for substances detected or having reasonable probability of entering groundwater resources.
Wisconsin State Environmental Protection — Hazardous Waste Management:	NR 660	Provides definitions, general permit application information, incorporation by reference citations and general information concerning the hazardous waste management program.
Identification and Listing of Hazardous Waste	NR 661	Establishes criteria for identifying the characteristics of hazardous waste to determine if the waste is subject to regulation.
Corrective Action Management Unit[1]	NR 664 Subpart S	Establishes the requirements for use of a CAMU to support the implementation of corrective action activities.
Wisconsin State Environmental Protection — Investigation and Remediation of Environmental Contamination	NR 700	Establishes standards and procedures that allow for site-specific flexibility, pertaining to the identification, investigation and remediation of sites and facilities that are subject to regulation under s. 144.442, 144.76, or 144.77 Stats.
Wisconsin State Environmental Protection — Soil Cleanup Standards	NR 720 and 722	Provides for establishment of site-specific residual contaminant levels or performance standards and establishes requirements for identification, evaluation and selection of remedial alternatives.
Permits		
Wisconsin Pollutant Discharge Elimination System — General Storm Water Permit	NR 216	Defines the conditions under which stormwater associated with specific (industrial, municipal or construction) activities can be discharged.
Industrial Storm Water Discharge Permit	NR 216.20-32	
Construction Site Storm Water Discharge Permit	NR 216.41-55	
Clean Water Act Permit (United States Army Corps of Engineers [USACOE])	Section 404	Grants USACOE approval to discharge dredged or fill material into wetlands and other waters of the United States at specified disposal sites (33 U.S.C. Ch. 1344).
Wisconsin Department of Natural Resources (WDNR) — Water Quality Certification Permit	NR 103, 299 (WDNR) Section 401 (CWA)	Establishes procedures and criteria for the application, processing and review of state water-quality certifications (for surface waters and wetlands) required by the provisions of the federal water pollution control act, 33 U.S.C. ss. 1251 et seq.
Douglas County Nonmetallic Mining Permit	NR 135 Douglas County Ordinances, Chapter VII,	Required for use of any mining area greater than 1 acre, covering the removal of stone, sand, gravel, clay and topsoil. Potentially applicable if a local borrow source for fill material.
Hazardous Waste Facility Operation License/Closure and Long-Term Care Plan Approval	N/A	WDNR "permit" covering closure and long-term care of the closed RCRA surface impoundments, and also Site-wide corrective action activities

Note:
1. As acknowledged by the WDNR in a letter to Beazer dated November 1, 2000, the use of a CAMU at the Site is "grandfathered" under the 1993 CAMU regulations.

Figures



BASE MAP SOURCE: USGS 7.5 MIN TOPO QUAD., SUPERIOR, WIS–MINN., 1954 (PHOTO REVISED 1993)

LEGEND:

APPROXIMATE PROPERTY BOUNDARY

0 1000' 2000'

APPROXIMATE GRAPHIC SCALE

AREA LOCATION

WISCONSIN

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

SITE LOCATION MAP

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
1

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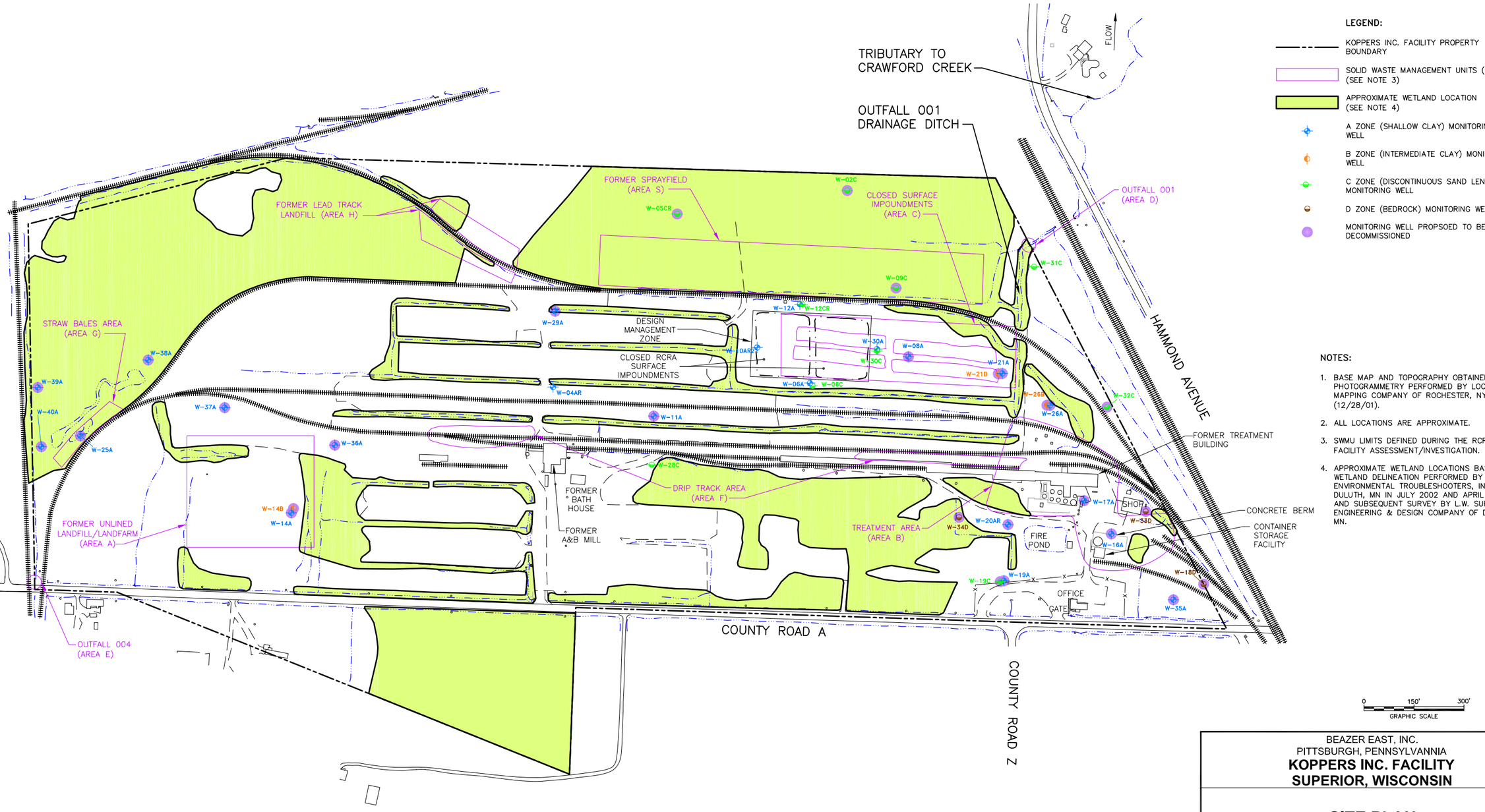

LEGEND:

- KOPPERS INC. FACILITY PROPERTY BOUNDARY
- SOLID WASTE MANAGEMENT UNITS (SWMUs) (SEE NOTE 3)
- APPROXIMATE WETLAND LOCATION (SEE NOTE 4)
- A ZONE (SHALLOW CLAY) MONITORING WELL
- B ZONE (INTERMEDIATE CLAY) MONITORING WELL
- C ZONE (DISCONTINUOUS SAND LENS) MONITORING WELL
- D ZONE (BEDROCK) MONITORING WELL
- MONITORING WELL PROPSOED TO BE DECOMMISSIONED

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.
3. SWMU LIMITS DEFINED DURING THE RCRA FACILITY ASSESSMENT/INVESTIGATION.
4. APPROXIMATE WETLAND LOCATIONS BASED ON WETLAND DELINEATION PERFORMED BY ENVIRONMENTAL TROUBLESHOOTERS, INC. OF DULUTH, MN IN JULY 2002 AND APRIL 2005, AND SUBSEQUENT SURVEY BY L.W. SURVEY ENGINEERING & DESIGN COMPANY OF DULUTH, MN.

0 150' 300'
GRAPHIC SCALE

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

SITE PLAN

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
2

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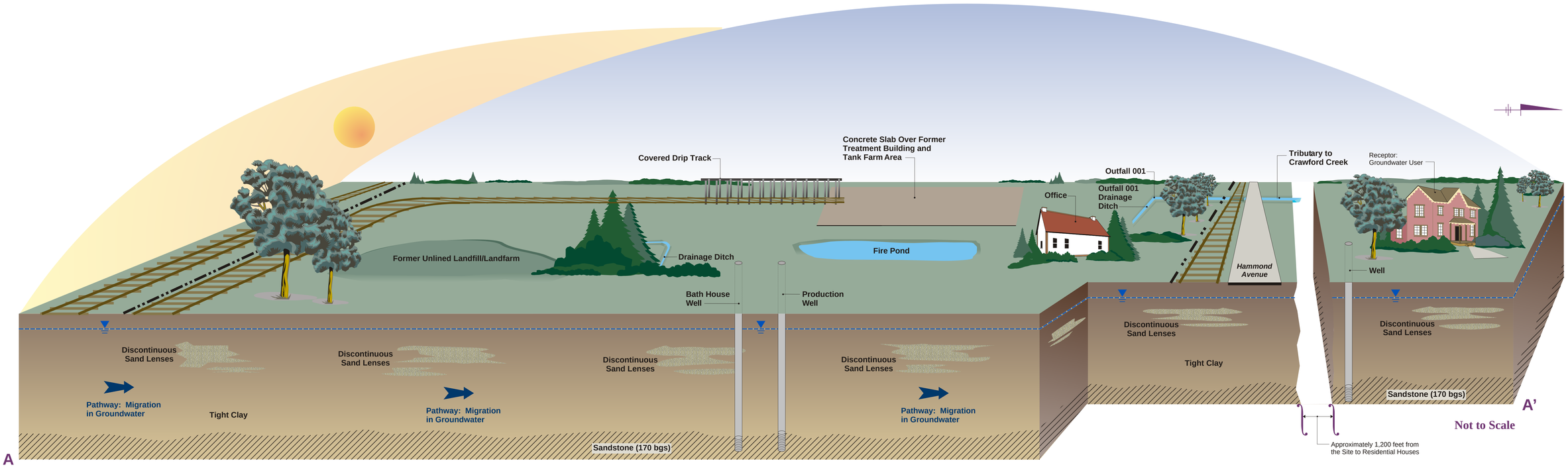
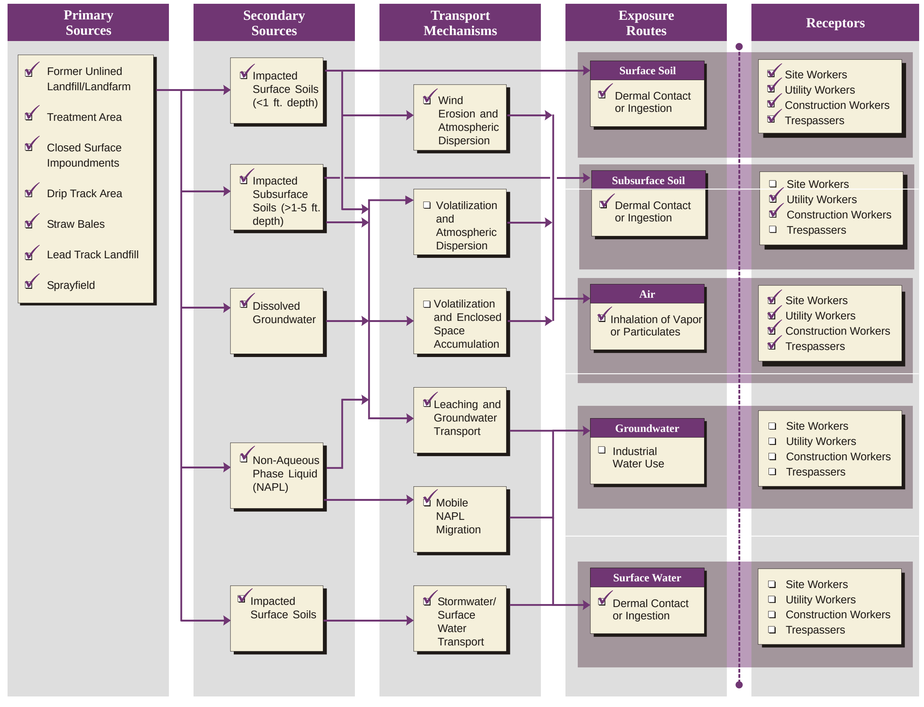
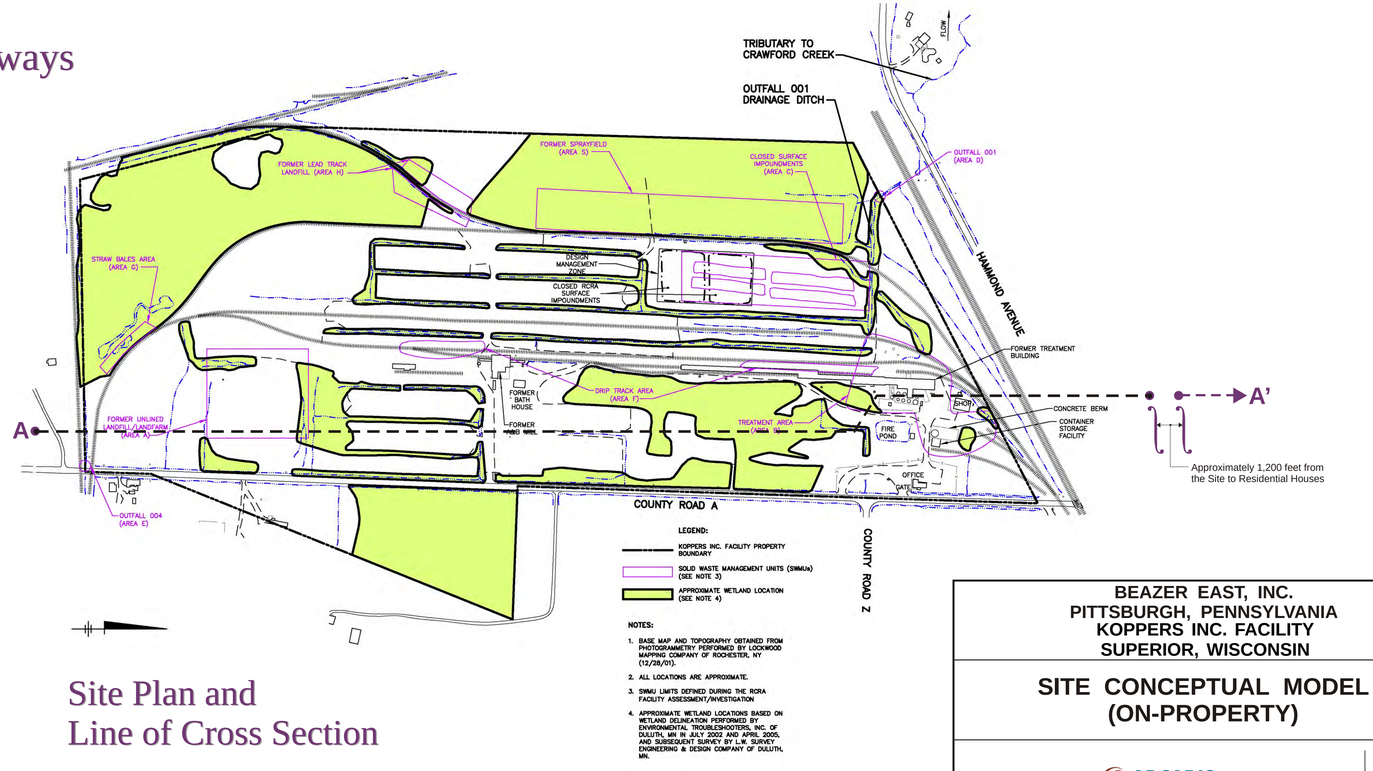


Cross Section A - A'

Flow Chart - Theoretical Transport and Human Exposure Pathways





Site Plan and Line of Cross Section

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

SITE CONCEPTUAL MODEL (ON-PROPERTY)

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE 3

07/12/07 SYR-85-LBR RLP KLS DJH
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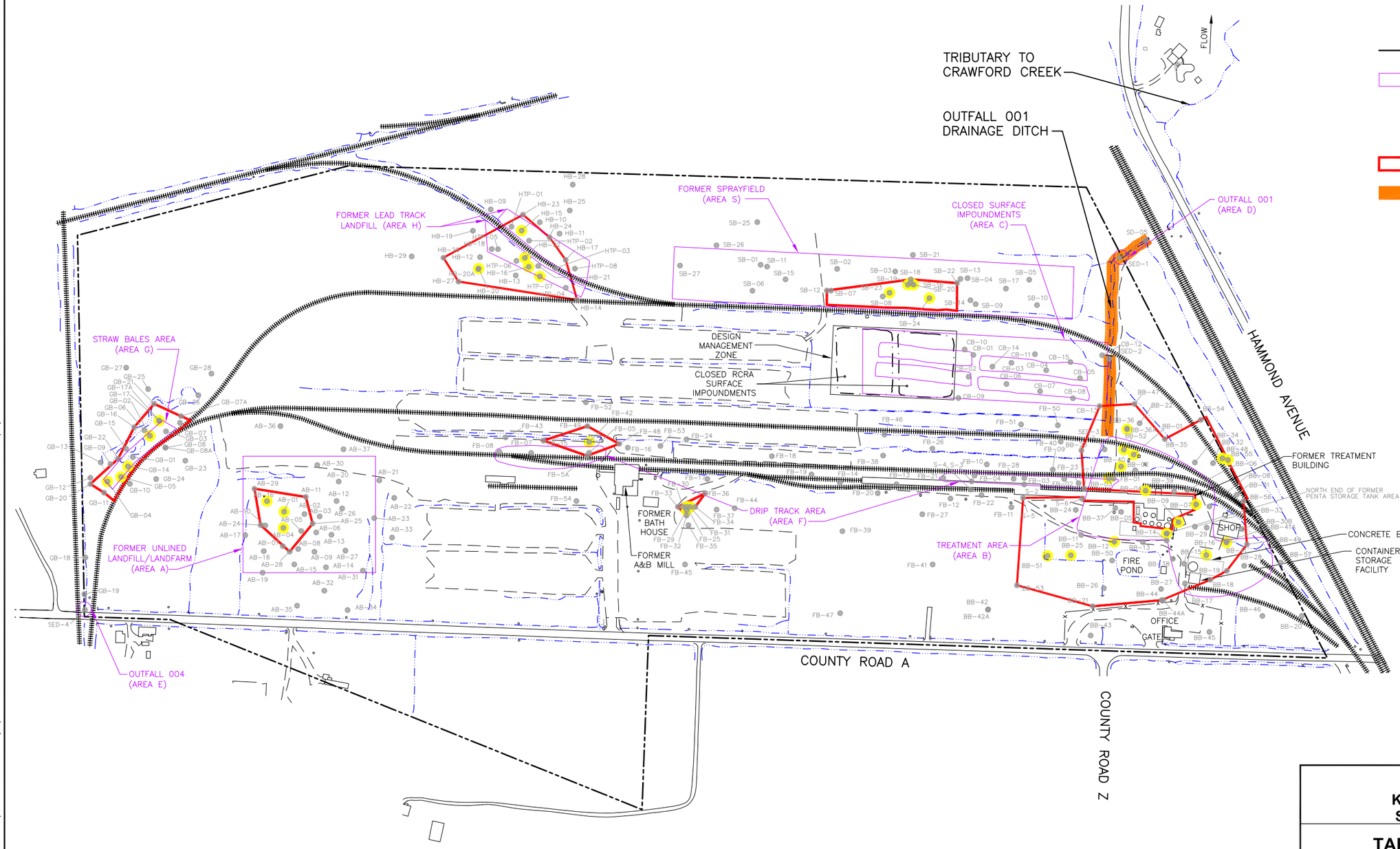

LEGEND:

- KOPPERS INC.FACILITY PROPERTY BOUNDARY
- SOLID WASTE MANAGEMENT UNITS (SWMUs) (SEE NOTE 3)
- 1988–2006 SOIL SAMPLE LOCATION
- SOIL SAMPLE LOCATION REQUIRING CORRECTIVE ACTION BASED ON POST–REMEDIATION HHRA
- TARGETED ON–PROPERTY SOIL CORRECTIVE ACTION AREA (SEE NOTE 4)
- TARGETED OUTFALL 001 DRAINAGE DITCH CORRECTIVE ACTION AREA

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.
3. SWMU LIMITS DEFINED DURING THE RCRA FACILITY ASSESSMENT/INVESTIGATION.
4. THE EXTENT OF ON–PROPERTY SOILS TARGETED FOR CORRECTIVE ACTION ENCOMPASSES SOIL SAMPLES DETERMINED TO REQUIRE CORRECTIVE ACTION BASED ON THE RESULTS OF THE POST–REMEDIATION HUMAN HEALTH RISK ASSESSMENT (HHRA). IN GENERAL, THE CORRECTIVE ACTION BOUNDARIES WERE FORMED BY CONNECTING "CLEAN" SAMPLE POINTS THAT SURROUND SAMPLES REQUIRING CORRECTIVE ACTION BASED ON THE HHRA. WHERE APPROPRIATE, SITE FEATURES WERE ALSO USED TO ESTABLISH BOUNDARIES.

0 150' 300'
GRAPHIC SCALE

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

TARGETED CORRECTIVE ACTION AREAS

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
4

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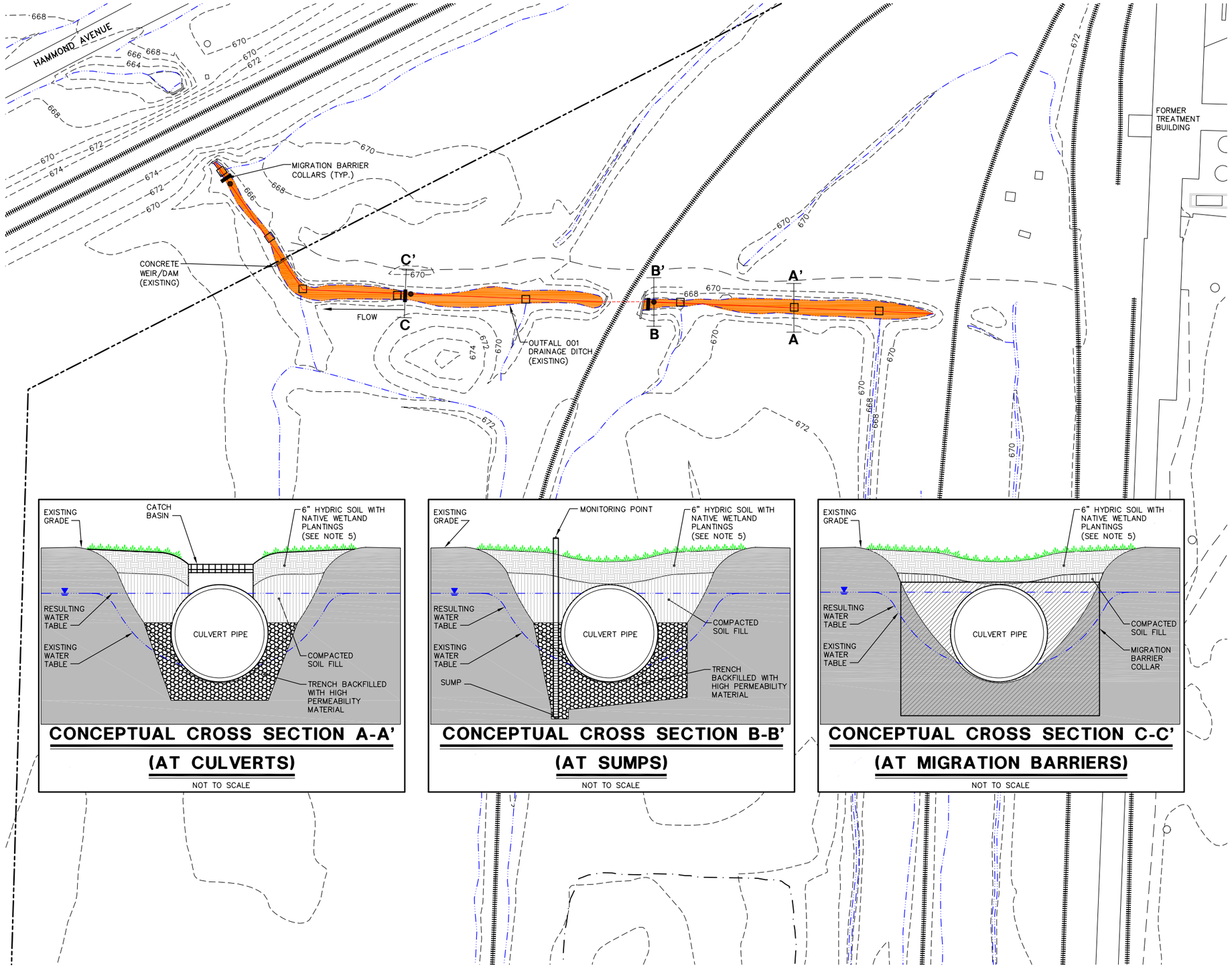


CONCEPTUAL CROSS SECTION A-A'

(AT CULVERTS)

NOT TO SCALE

CONCEPTUAL CROSS SECTION B-B'

(AT SUMPS)

NOT TO SCALE

CONCEPTUAL CROSS SECTION C-C'

(AT MIGRATION BARRIERS)

NOT TO SCALE

LEGEND:

- KOPPERS INC. FACILITY PROPERTY BOUNDARY
- EXISTING DITCH CHANNEL TO BE CULVERTED
- CULVERT PIPE
- CATCH BASIN
- MIGRATION BARRIER COLLAR
- COLLECTION SUMP/MONITORING POINT

NOTES:

1. BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LOCKWOOD MAPPING COMPANY OF ROCHESTER, NY (12/28/01 AND 04/04/03).
2. ALL LOCATIONS ARE APPROXIMATE.
3. CULVERT SIZE BASED ON TARGET CAPACITY AND SLOPE.
4. CATCH BASINS REQUIRED WHERE EXISTING TRIBUTARIES ENTER DITCH AND AT PERIODIC SPACINGS TO ALLOW FOR COLLECTION OF SURFACE WATER RUNOFF.
5. COVER TYPES ABOVE THE CULVERT WOULD BE DETERMINED DURING DETAILED DESIGN AND IN CONSIDERATION OF ANY WETLAND–PERMIT REQUIREMENTS.

0 40' 80'

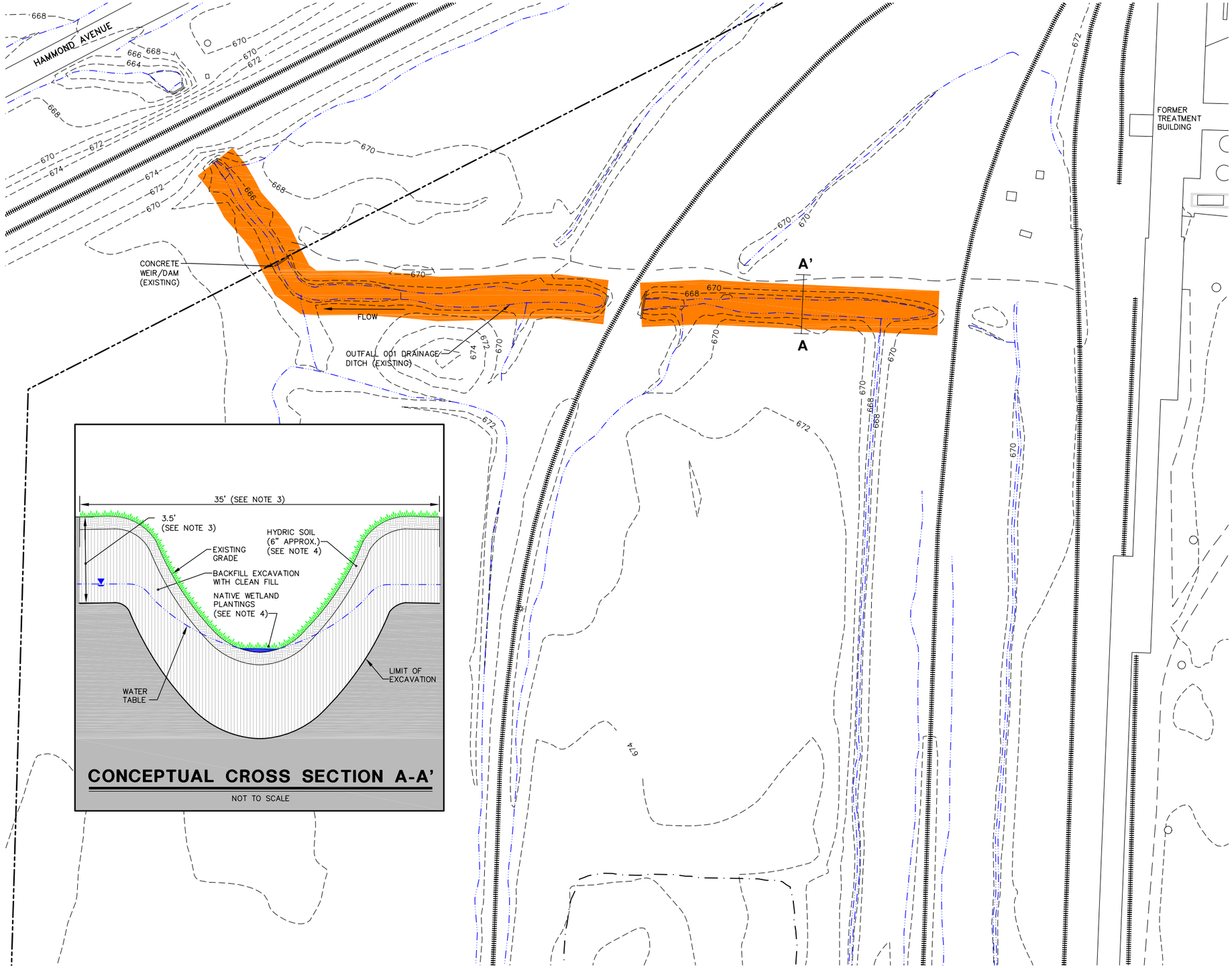
GRAPHIC SCALE

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

CONCEPTUAL CULVERTING APPROACH - ON-PROPERTY OUTFALL 001 DRAINAGE DITCH ALTERNATIVE D-1

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
5



CONCEPTUAL CROSS SECTION A-A'

NOT TO SCALE

NOTES:

1. BASE MAP AND TOPOGRAPHY OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LOCKWOOD MAPPING COMPANY OF ROCHESTER, NY (12/28/01 AND 04/04/03).
2. ALL LOCATIONS ARE APPROXIMATE.
3. LIMITS OF EXCAVATION, INCLUDING THE LENGTH OF DITCH SUBJECT TO EXCAVATION ARE ASSUMED BASED ON EXISTING FIELD DATA. LIMITS SUBJECT TO FURTHER ASSESSMENT PRIOR TO IMPLEMENTATION (IF SELECTED).
4. THE EXTENT OF HYDRIC SOILS AND WETLAND PLANTINGS TO INCLUDE LIMITS OF DITCH PLUS CURRENT WETLANDS ADJACENT TO DITCH. IN NON-WETLAND AREAS, VEGETATED SOIL FILL WILL BE USED IN LIEU OF HYDRIC SOILS AND WETLAND PLANTINGS.

0 40' 80'
GRAPHIC SCALE

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

CONCEPTUAL EXCAVATION APPROACH - ON-PROPERTY OUTFALL 001 DRAINAGE DITCH ALTERNATIVE D-2

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
6

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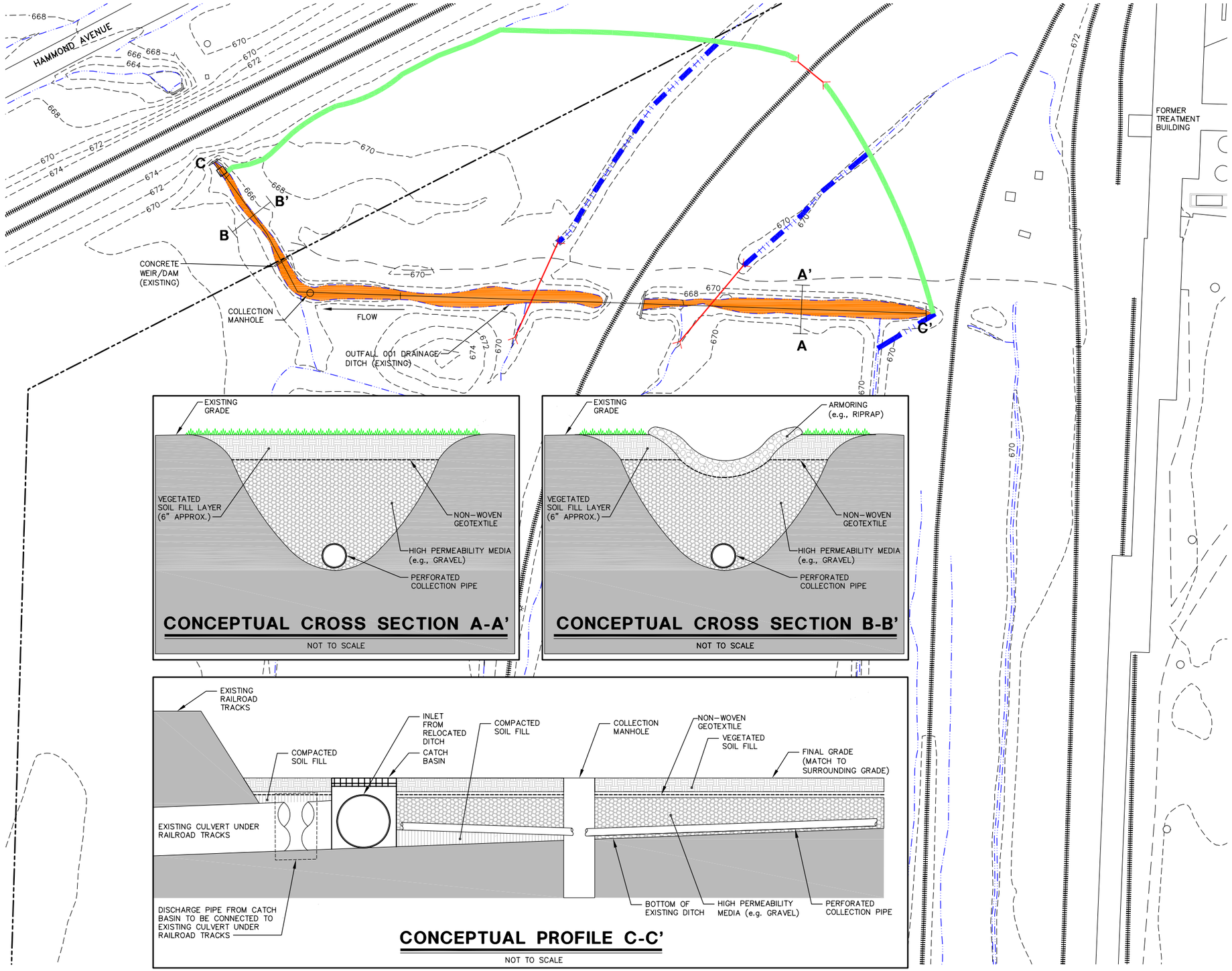

CONCEPTUAL CROSS SECTION A-A'

NOT TO SCALE

CONCEPTUAL CROSS SECTION B-B'

NOT TO SCALE

CONCEPTUAL PROFILE C-C'

NOT TO SCALE

KOPPERS INC. FACILITY PROPERTY BOUNDARY
EXISTING DITCH CHANNEL TO BE BACKFILLED
PATH OF RELOCATED DITCH
NEW CULVERTS
TRIBUTARY EXTENTIONS
CATCH BASIN

NOTES:

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

0 40' 80'
GRAPHIC SCALE

BEAZER EAST, INC.
PITTSBURGH, PENNSYLVANNIA

KOPPERS INC. FACILITY
SUPERIOR, WISCONSIN

CONCEPTUAL RELOCATION APPROACH - ON-PROPERTY OUTFALL 001 DRAINAGE DITCH ALTERNATIVE D-3

ARCADIS BBL
Infrastructure, environment, facilities

FIGURE
7

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