

CRAWFORD CREEK AND TRIBUTARY SITE – SUPERIOR, WI

**Meeting to Discuss Remedial Action Objectives for
Focused Feasibility Study**

November 29, 2016

WDNR Offices – Madison, WI

Agenda

- Recap of 5/12/16 Meeting and Action Items
 - Hazardous Waste Determination
 - Soil vs. Sediment
 - Reuse of Excavate Materials
 - Remedial Alternatives
- Discuss/Develop RAOs
 - RAO Definition
 - Review RAOs from 2014 FCMS
 - Review WDNR's Proposed RAOs from 5/12/16 Meeting
 - RAOs to Address BUI Goals
 - Evaluate and Refine Revised List of RAOs
- Action Items/Next Steps/Schedule

Recap of 5/12/16 Meeting and Action Items

Hazardous Waste Determination Status

- July 7, 2016 - Beazer sent letter to WDNR concluding that sediment/soil in off-property portion of the Site can be characterized as non-hazardous
- July 12, 2016 – WDNR request for additional information on similar determinations made at other Beazer sites
- November 1, 2016 – Beazer submitted requested information to WDNR

Soil vs. Sediment

From May 12, 2016 Meeting Minutes:






- WDNR to initiate discussions on defining sediment at the Site, based on the Ordinary High Water Mark (OHWM)

Considerations:

- WI Supreme Court defined OHWM as “The point on the bank or shore up to which the presence and action of the water is so continuous as to leave a distinct mark either by erosion, destruction of terrestrial vegetation or other easily recognized characteristic.”
- Indicators of OHWM may include (per WDNR pamphlets):
 - Stains on rocks or other shoreline structures
 - Bare dirt, marks on trees
 - Exposed roots running along the shoreline
 - Changes in vegetation from water plants to upland plants
- Wetland boundaries (see map on next slide)

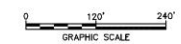


LEGEND:

-  LIMIT OF WETLAND ASSESSMENT AREA
-  IDENTIFIED WETLAND BOUNDARY
-  EMERGENT WETLAND (E1H)
-  SCRUB/SHRUB WETLAND (S1H)
-  FORESTED WETLAND (T1K)

NOTE:

1. 2008 AERIAL PHOTOGRAPH FROM THE GEODATA GATEWAY.
2. PARENTHICAL LEGEND REFERENCES INDICATE WISCONSIN WETLAND INVENTORY COVERTYPE CLASSIFICATION.



BEAZER EAST, INC.
 KOPPERS INC. FACILITY
 SUPERIOR, WISCONSIN
WETLAND DELINEATION REPORT

IDENTIFIED WETLAND HABITAT TYPES



FIGURE
6

MAPS PROJECT NAME: ---
 39158001
 39158000
 39158002

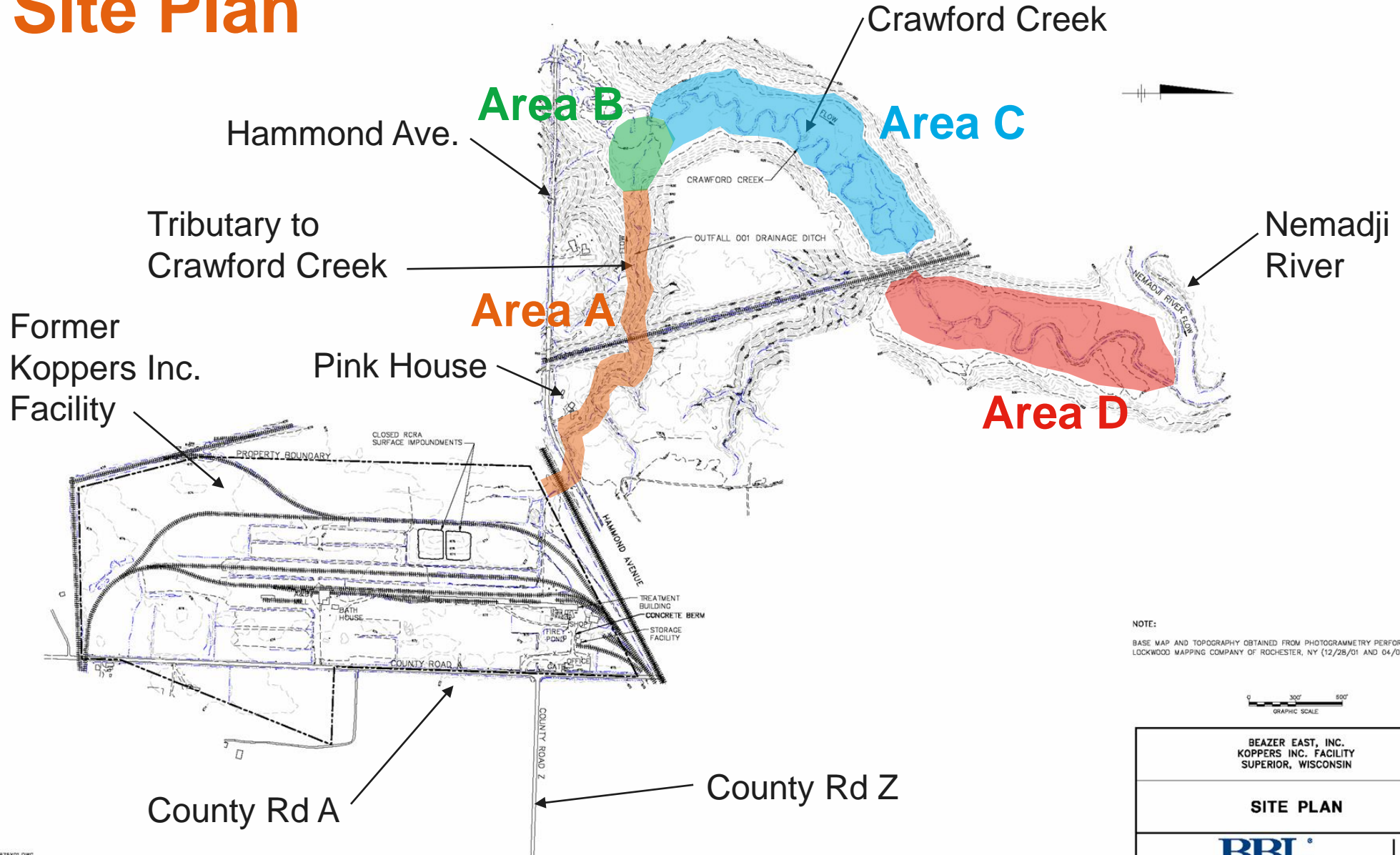
Reuse of Excavated Materials

From May 12, 2016 Meeting Minutes:

- WDNR to conduct a preliminary evaluation of the existing creek/floodplain data as it relates to the re-use of excavated material as backfill, per NR 718
- Considerations:
 - RCRA “Area of Contamination” Policy

Review of Remedial Alternatives

Site Plan



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

BEAZER EAST, INC. KOPPERS INC. FACILITY SUPERIOR, WISCONSIN	
SITE PLAN	
	FIGURE 2

X: 39875001.DWG
 L: ON=OFF=REF
 P: PAGESSET/PLT=GL
 11/17/04 SYN-BD-KMD DJP LAF
 39875001/39875001.DWG

Area A Remedial Alternatives Identified To-Date

- Alt. A1 (FCMS) – Channel and Bank Cover
- Alt. A2 (FCMS) – Channel and Bank Cover, with DNAPL Collection Provisions
- Alt. A3 (FCMS) – Extended Channel and Bank Excavation/Backfill

- Alt. A2 preferred alternative in FCMS



Summary of Area A Alternatives/Volumes/Est. Costs

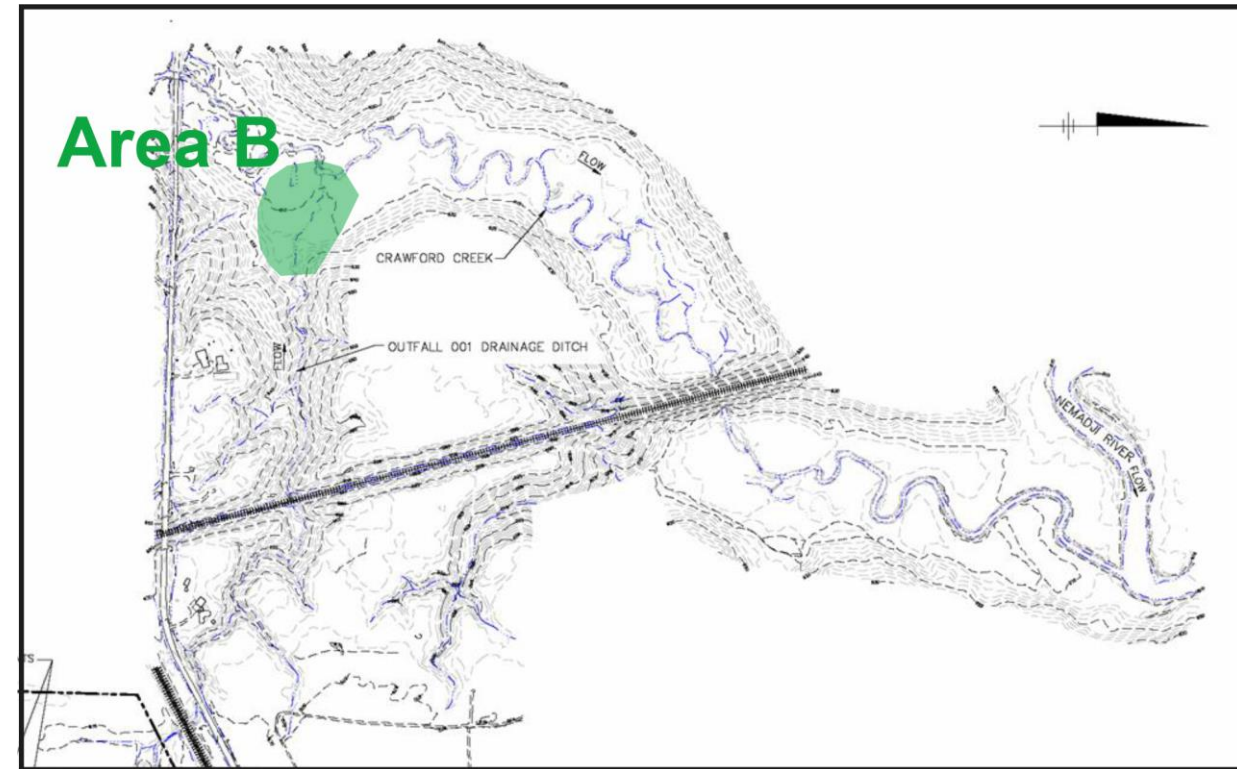
	FCMS Alt. A1 Channel and Bank Cover	FCMS Alt. A2 Channel and Bank Cover, with DNAPL Collection Provisions ¹	FCMS Alt. A3 Extended Channel and Bank Excavation/ Backfill
Volume for disposal (cy)	500	506	60,700
Est. Cost (CAMU T&D)	--	--	\$28M
Est. Cost (Off-Site T&D) ²	\$3.2M	\$2.8M	\$82M

Note: Preliminary cost estimates - intended accuracy -30% to +50%.

1. Alt. A2 preferred alternative in FCMS.
2. Off-site T&D assumes listed hazardous waste disposal at an incinerator facility. Costs would be lower if classified as non-hazardous.

Area B Remedial Alternatives Identified To-Date

- Alt. B1 (FCMS) – Partial Channel Excavation/Backfill, 1' Floodplain Cover
 - Alt. B2 (FCMS) – Partial Channel Excavation/Backfill, 1' Floodplain Excavation/Backfill
 - Alt. B3 (FCMS) – Extended Channel and Floodplain Excavation/Backfill
 - Alt. B4 – “Mass Removal” as discussed at 5/12/16 meeting
-
- Alt. B1 preferred alternative in FCMS



Summary of Area B Alternatives/Volumes/Est. Costs

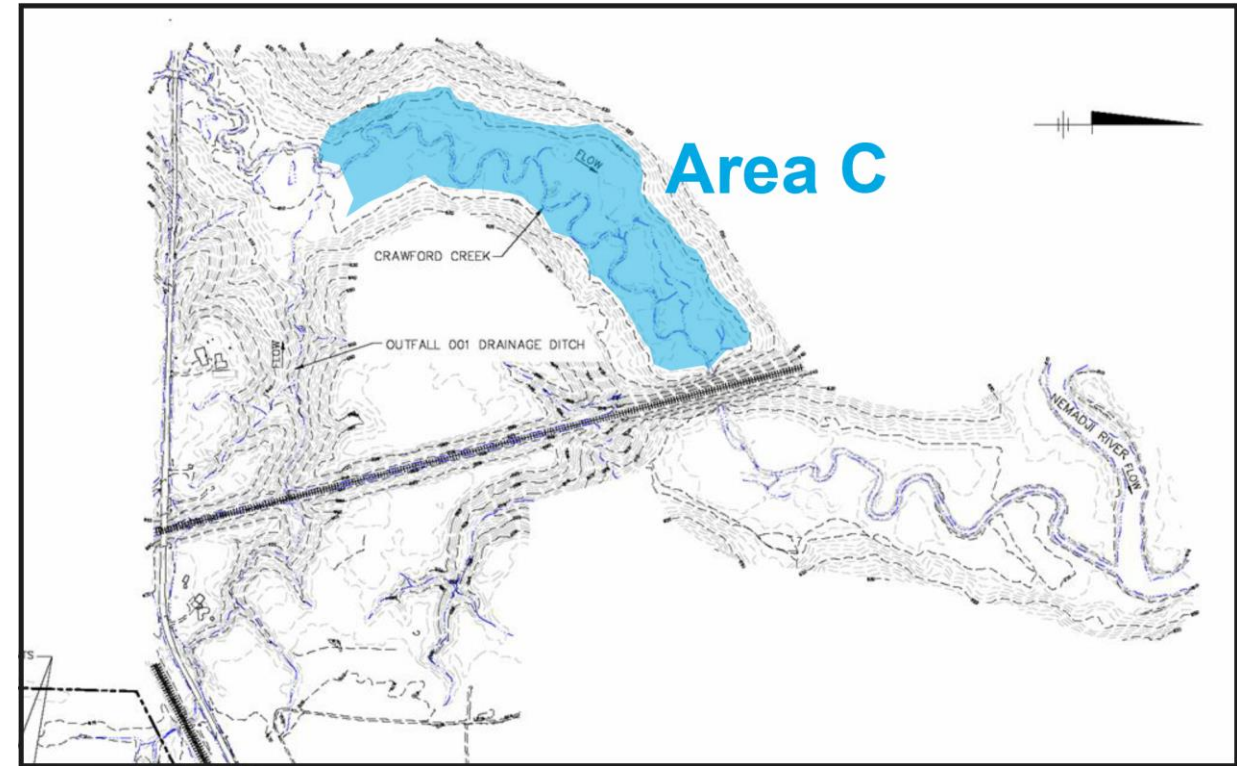
	FCMS Alt. B1 Partial Channel Excavation/ Backfill, 1' Floodplain Cover ¹	FCMS Alt. B2 Partial Channel Excavation/ Backfill, 1' Floodplain Excavation/ Backfill	FCMS Alt. B3 Extended Channel and Floodplain Excavation/ Backfill	Alt. B4 WDNR "Mass Removal Alternative" Discussed at 5/12/16 Meeting
Volume for disposal (cy)	139	5,567	55,716	21,706
Est. Cost (CAMU T&D)	--	\$3.1M	\$22M	\$10M
Est. Cost (Off-Site T&D) ²	\$1.2M	\$7.1M	\$72M	\$29M

Note: Preliminary cost estimates - intended accuracy -30% to +50%.

1. Alt. B1 preferred alternative in FCMS.
2. Off-site T&D assumes listed hazardous waste disposal at an incinerator facility. Costs would be lower if classified as non-hazardous.

Area C Remedial Alternatives Identified To-Date

- Alt. C1 (FCMS) – Channel Relocation with Armored Channel
- Alt. C2 (FCMS) – Channel Relocation with Clay-Lined Channel
- Alt. C3 (FCMS) – Partial Channel Excavation/Backfill
- Alt. C4 (FCMS) – Extended Channel and Floodplain Excavation/Backfill
- Alt. C5 – “Lined/Capped Channel Relocation” as discussed at 5/12/16 meeting
- Alt. C6 – “Mass Removal” as discussed at 5/12/16 meeting



- Alt. C2 preferred alternative in FCMS

Summary of Area C Alternatives/Volumes/Est. Costs

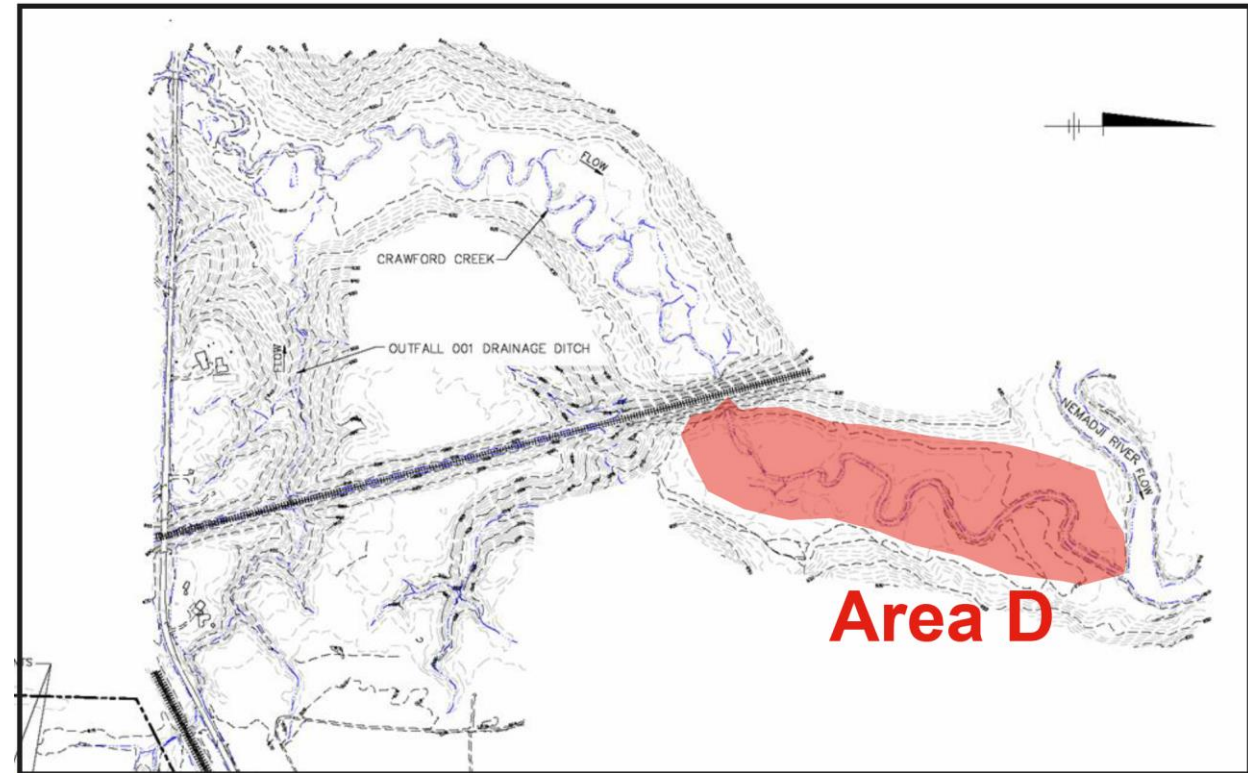
	FCMS Alt. C1 Channel Relocation with Armored Channel	FCMS Alt. C2 Channel Relocation with Clay- Lined Channel ¹	FCMS Alt. C3 Partial Channel Excavation/ Backfill	FCMS Alt. C4 Extended Channel and Floodplain Excavation/ Backfill	Alt. C5 WDNR “Lined/ Capped Channel Relocation Alternative” Discussed at 5/12/16 Meeting	Alt. C6 WDNR “Mass Removal Alternative” Discussed at 5/12/16 Meeting
Volume for disposal (cy)	500	2,730	3,156	95,194	2,730	33,519 – 159,444
Est. Cost (CAMU T&D)	--	\$3.9M	\$3.5M	\$41M	\$4.2M	\$16M – 81M
Est. Cost (Off-Site T&D) ²	\$4.1M	\$5.4M	\$5.3M	\$126M	\$5.7M	\$46M – 225M

Note: Preliminary cost estimates - intended accuracy -30% to +50%.

1. Alt. C2 preferred alternative in FCMS.
2. Off-site T&D assumes listed hazardous waste disposal at an incinerator facility. Costs would be lower if classified as non-hazardous.
3. Channel relocation costs assume materials generated from new channel excavation can be used to backfill existing channel. Costs would be higher if this is not allowed.

Area D Remedial Alternatives

- As discussed at 5/12/16 meeting, before any specific corrective action alternatives are identified/discussed related to creek sediments in Area D, additional investigations should be conducted to identify and delineate the extent of visibly impacted creek sediments and surface water sheens
- Investigations completed in early November 2016; summary report anticipated to be completed in Q1 2017



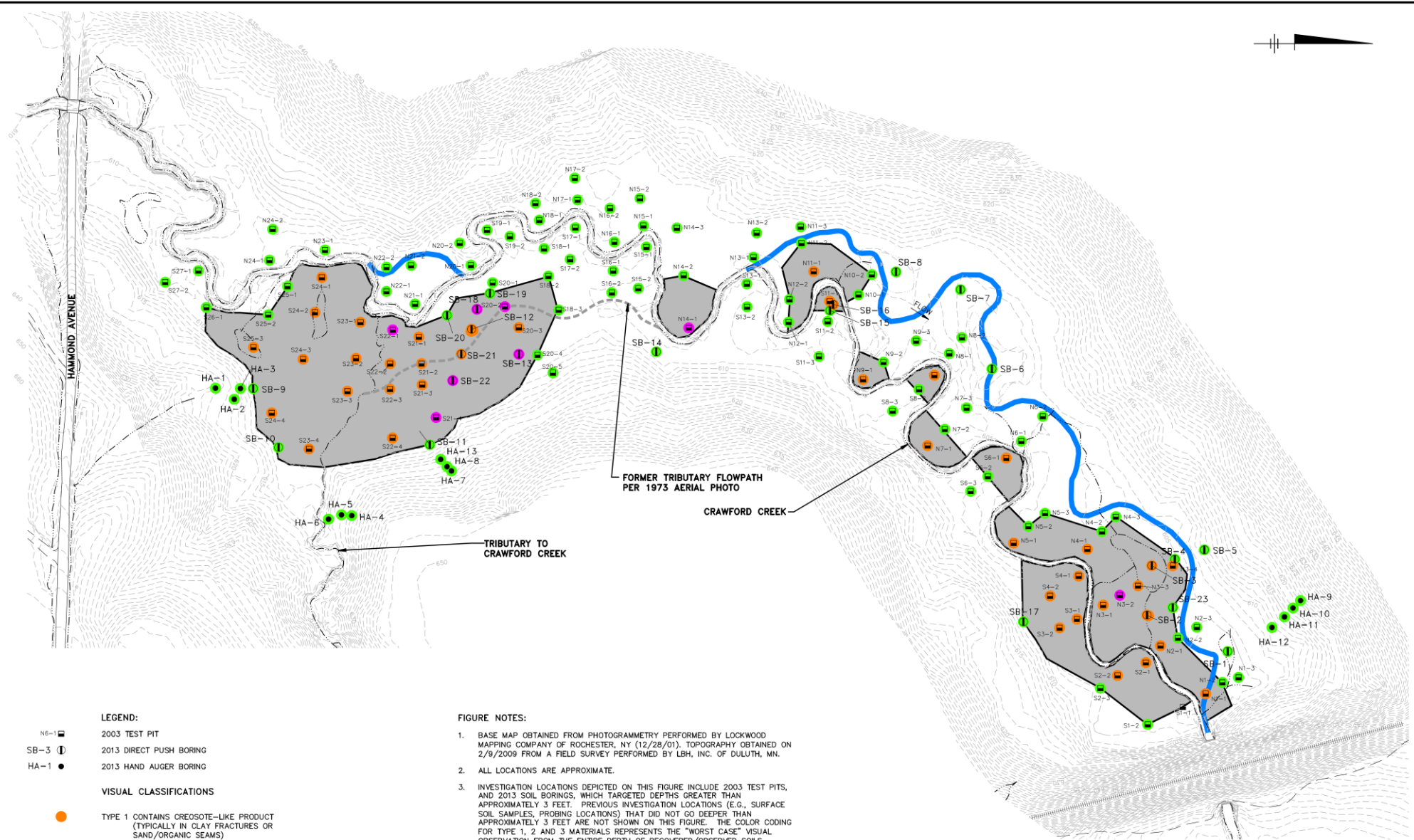
Discuss/Develop RAOs

RAO Definition

From USEPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA:

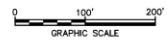
- RAOs consist of medium-specific or operable unit-specific goals for protecting human health and the environment. The objectives should be as specific as possible but not so specific that the range of alternatives that can be developed is unduly limited.

As discussed at 5/12/16 meeting, a “weight of evidence/professional judgment” approach will be used to determine areas requiring corrective action



- LEGEND:**
- N6-1 2003 TEST PIT
 - SB-3 2013 DIRECT PUSH BORING
 - HA-1 2013 HAND AUGER BORING
- VISUAL CLASSIFICATIONS**
- TYPE 1 CONTAINS CREOSOTE-LIKE PRODUCT (TYPICALLY IN CLAY FRACTURES OR SAND/ORGANIC SEAMS)
 - TYPE 2 EXHIBITS A CREOSOTE-LIKE ODOR, STAINING AND/OR SHEEN, BUT DOES NOT CONTAIN CREOSOTE-LIKE PRODUCT
 - TYPE 3 DOES NOT EXHIBIT VISUAL EVIDENCE OF IMPACTS (I.E., NO STAINING, SHEENS OR PRODUCT) OR CREOSOTE-LIKE ODOR
- PROPOSED CRAWFORD CREEK REALIGNMENT
- AREAS WITH OBSERVED VISIBLY IMPACTED SUBSURFACE FLOODPLAIN MATERIALS. INCLUDES A BLACK STAINED LAYER TYPICALLY PRESENT FROM APPROXIMATELY 2-4 FEET BELOW GRADE, AND/OR CREOSOTE-LIKE PRODUCT IN CLAY CRACKS/FRACTURES AND/OR SAND/ORGANIC SEAMS PRESENT ANYWHERE FROM 4 TO UP TO 30 FEET BELOW GRADE.

- FIGURE NOTES:**
- BASE MAP OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LOCKWOOD MAPPING COMPANY OF ROCHESTER, NY (12/28/01). TOPOGRAPHY OBTAINED ON 2/9/2009 FROM A FIELD SURVEY PERFORMED BY LBH, INC. OF DULUTH, MN.
 - ALL LOCATIONS ARE APPROXIMATE.
 - INVESTIGATION LOCATIONS DEPICTED ON THIS FIGURE INCLUDE 2003 TEST PITS, AND 2013 SOIL BORINGS, WHICH TARGETED DEPTHS GREATER THAN APPROXIMATELY 3 FEET. PREVIOUS INVESTIGATION LOCATIONS (E.G., SURFACE SOIL SAMPLES, PROBING LOCATIONS) THAT DID NOT GO DEEPER THAN APPROXIMATELY 3 FEET ARE NOT SHOWN ON THIS FIGURE. THE COLOR CODING FOR TYPE 1, 2 AND 3 MATERIALS REPRESENTS THE "WORST CASE" VISUAL OBSERVATION FROM THE ENTIRE DEPTH OF RECOVERED/OBSERVED SOILS.



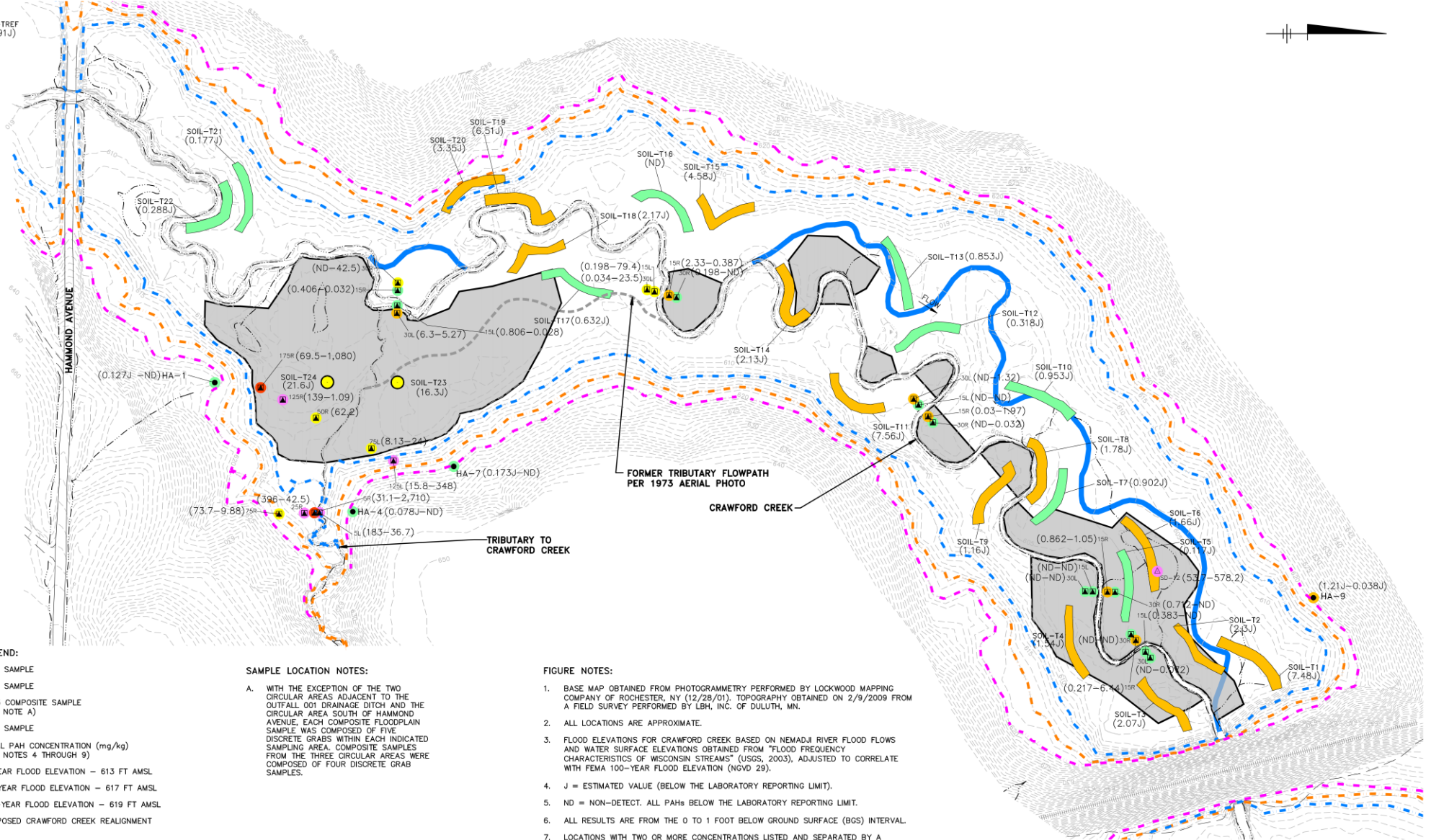
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FORMER KOPPERS INC. FACILITY
SUPERIOR, WISCONSIN

SUMMARY OF VISUAL OBSERVATIONS FOR SUBSURFACE MATERIALS



PROJECT NAME: ---
 XREFS: 38320X00
 38320X01
 38320X03

SOIL-TREJ
(0.191J)



LEGEND:

- SD-12 Δ 1996 SAMPLE
- FP ■ 1999 SAMPLE
- SOIL-T3 □ 2005 COMPOSITE SAMPLE (SEE NOTE A)
- HA-1 ● 2013 SAMPLE
- (0.173J-ND) TOTAL PAH CONCENTRATION (mg/kg) (SEE NOTES 4 THROUGH 9)
- - - 2-YEAR FLOOD ELEVATION - 613 FT AMSL
- - - 25-YEAR FLOOD ELEVATION - 617 FT AMSL
- - - 100-YEAR FLOOD ELEVATION - 619 FT AMSL
- PROPOSED CRAWFORD CREEK REALIGNMENT

CONCENTRATION RANGES

- <1 mg/kg
- 1 - 10 mg/kg
- 10 - 100 mg/kg
- 100 - 1,000 mg/kg
- >1,000 mg/kg

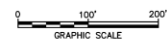
AREAS WITH OBSERVED VISIBLY IMPACTED SUBSURFACE FLOODPLAIN MATERIALS INCLUDES A BLACK STAINED LAYER TYPICALLY PRESENT FROM APPROXIMATELY 2-4 FEET BELOW GRADE, AND/OR CREOSOTE-LIKE PRODUCT IN CLAY CRACKS/FRACTURES AND/OR SAND/ORGANICS SEMS PRESENT ANYWHERE FROM 4 TO UP TO 30 FEET BELOW GRADE.

SAMPLE LOCATION NOTES:

A. WITH THE EXCEPTION OF THE TWO CIRCULAR AREAS ADJACENT TO THE OUTFALL 001 DRAINAGE DITCH AND THE CIRCULAR AREA SOUTH OF HAMMOND AVENUE, EACH COMPOSITE FLOODPLAIN SAMPLE WAS COMPOSED OF FIVE DISCRETE GRABS WITHIN EACH INDICATED SAMPLING AREA. COMPOSITE SAMPLES FROM THE THREE CIRCULAR AREAS WERE COMPOSED OF FOUR DISCRETE GRAB SAMPLES.

FIGURE NOTES:

1. BASE MAP OBTAINED FROM PHOTOGRAMMETRY PERFORMED BY LOCKWOOD MAPPING COMPANY OF ROCHESTER, NY (12/28/01). TOPOGRAPHY OBTAINED ON 2/9/2009 FROM A FIELD SURVEY PERFORMED BY LBH, INC. OF DULUTH, MN.
2. ALL LOCATIONS ARE APPROXIMATE.
3. FLOOD ELEVATIONS FOR CRAWFORD CREEK BASED ON NEMADJ RIVER FLOOD FLOWS AND WATER SURFACE ELEVATIONS OBTAINED FROM "FLOOD FREQUENCY CHARACTERISTICS OF WISCONSIN STREAMS" (USGS, 2003), ADJUSTED TO CORRELATE WITH FEMA 100-YEAR FLOOD ELEVATION (NGVD 29).
4. J = ESTIMATED VALUE (BELOW THE LABORATORY REPORTING LIMIT).
5. ND = NON-DETECT. ALL PAHS BELOW THE LABORATORY REPORTING LIMIT.
6. ALL RESULTS ARE FROM THE 0 TO 1 FOOT BELOW GROUND SURFACE (BGS) INTERVAL.
7. LOCATIONS WITH TWO OR MORE CONCENTRATIONS LISTED AND SEPARATED BY A HYPHEN (-) INDICATE TWO OR MORE SAMPLES WERE COLLECTED WITHIN THE 0-1 FOOT DEPTH INTERVAL. THE RESULTS ARE LISTED FROM THE MOST SHALLOW INTERVAL CONCENTRATION TO THE DEEPEST INTERVAL CONCENTRATION.
8. WHEN CALCULATING TOTAL PAHS, NON-DETECTS WERE GIVEN A VALUE OF ZERO.
9. WHEN A DUPLICATE SAMPLE WAS COLLECTED, THE HIGHER RESULT OF THE SAMPLE AND ITS DUPLICATE IS SHOWN.



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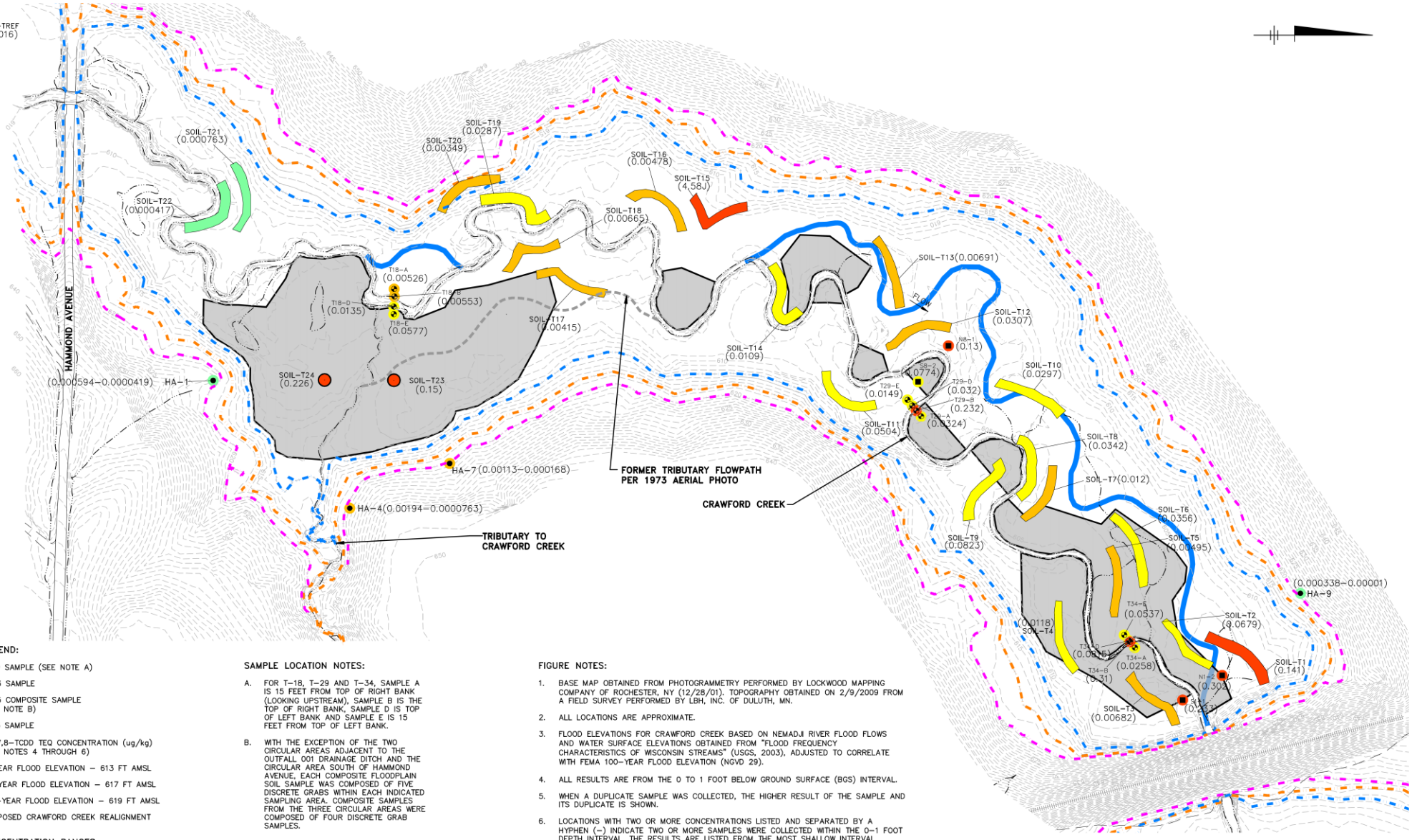
**TOTAL PAH ANALYTICAL RESULTS
FOR SURFICIAL (0 - 1')
BANK/FLOODPLAIN SAMPLES AND
SUBSURFACE VISUAL IMPACTS**

ARCADIS

FIGURE
2

PROJECT NAME: --
XREFS: 39320001
39320002
39320003

SOIL-TREF
(0.0016)



LEGEND:

- T29-0 1999 SAMPLE (SEE NOTE A)
- 2003 SAMPLE
- SOIL-T3 2005 COMPOSITE SAMPLE (SEE NOTE B)
- HA-1 2013 SAMPLE
- (0.000417)
- 2-YEAR FLOOD ELEVATION - 613 FT AMSL
- 25-YEAR FLOOD ELEVATION - 617 FT AMSL
- 100-YEAR FLOOD ELEVATION - 619 FT AMSL
- PROPOSED CRAWFORD CREEK REALIGNMENT

CONCENTRATION RANGES

- <0.001 ug/kg
- 0.001 - 0.01 ug/kg
- 0.01 - 0.1 ug/kg
- >0.1 ug/kg

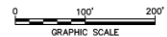
AREAS WITH OBSERVED VISIBLY IMPACTED SUBSURFACE FLOODPLAIN MATERIALS. INCLUDES A BLACK STAINED LAYER TYPICALLY PRESENT FROM APPROXIMATELY 2-4 FEET BELOW GRADE, AND/OR CREOSOTE-LIKE PRODUCT IN CLAY CRACKS/FRACTURES AND/OR SAND/ORGANICS SEEMS PRESENT ANYWHERE FROM 4 TO UP TO 30 FEET BELOW GRADE.

SAMPLE LOCATION NOTES:

- A. FOR T-18, T-29 AND T-34, SAMPLE A IS 15 FEET FROM TOP OF RIGHT BANK (LOOKING UPSTREAM). SAMPLE B IS THE TOP OF RIGHT BANK, SAMPLE D IS TOP OF LEFT BANK AND SAMPLE E IS 15 FEET FROM TOP OF LEFT BANK.
- B. WITH THE EXCEPTION OF THE TWO CIRCULAR AREAS ADJACENT TO THE OUTFALL 001 DRAINAGE DITCH AND THE CIRCULAR AREA SOUTH OF HAMMOND AVENUE, EACH COMPOSITE FLOODPLAIN SOIL SAMPLE WAS COMPOSED OF FIVE DISCRETE GRABS WITHIN EACH INDICATED SAMPLING AREA. COMPOSITE SAMPLES FROM THE THREE CIRCULAR AREAS WERE COMPOSED OF FOUR DISCRETE GRAB SAMPLES.

FIGURE NOTES:

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4. ALL RESULTS ARE FROM THE 0 TO 1 FOOT BELOW GROUND SURFACE (BGS) INTERVAL.
5. WHEN A DUPLICATE SAMPLE WAS COLLECTED, THE HIGHER RESULT OF THE SAMPLE AND ITS DUPLICATE IS SHOWN.
6. LOCATIONS WITH TWO OR MORE CONCENTRATIONS LISTED AND SEPARATED BY A HYPHEN (-) INDICATE TWO OR MORE SAMPLES WERE COLLECTED WITHIN THE 0-1 FOOT DEPTH INTERVAL. THE RESULTS ARE LISTED FROM THE MOST SHALLOW INTERVAL CONCENTRATION TO THE DEEPEST INTERVAL CONCENTRATION.



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**PCDD/PCDF ANALYTICAL RESULTS
FOR SURFICIAL (0 - 1')
BANK/FLOODPLAIN SAMPLES AND
SUBSURFACE VISUAL IMPACTS**

ARCADIS

FIGURE
3

PROJECTNAME: --
XREFS: 38320000
38320001
38320003

Basis of RAOs from 2014 FCMS

RAOs based on the findings of the HHERA:

- No unacceptable human health risks for any media/areas
- Potentially unacceptable ecological risks for:
 - Area B tributary channel sediments
 - Area B bank/floodplain materials
 - Area C creek channel sediments
- No unacceptable ecological risks for Area C floodplain materials
- No unacceptable ecological risks for Area D creek/floodplain

RAOs from 2014 FCMS

- Mitigate the potential for exposure by ecological receptors to the following impacted media:
 - Area A: Tributary channel sediment and bank materials
 - Area B: Tributary channel sediment and bank/floodplain materials
 - Area C: Crawford Creek channel sediment
- Mitigate the generation of COPC-related surface water sheens in Areas A, B, and C

WDNR's Proposed RAOs from 5/12/16 Meeting

1. Protective of human health and the environment.
2. Eliminate water quality impacts of contaminants of concern (COCs), including dissolved phase, sheen and NAPL blebs.
3. Eliminate direct exposure to COCs in creek and floodplain.
4. Eliminate future exposure and transport of COCs.
5. Minimize future institutional controls on properties not owned by Beazer.
6. No hard structures within creek and floodplain.
7. Eliminate discharge of NAPL phase COCs from fractures and/or NAPL saturated layers or seams.
8. Allow the creek to meander within the floodplain.

WDNR's Proposed RAOs from 5/12/16 Meeting

9. Keep the connection (hydrologic, biologic) of the stream, bank, and floodplain.
10. Maintain a natural channel as close as possible in form and dimensions to the existing channel.
11. Restore conditions such that banks and floodplain are free of COCs to an adequate depth so as to provide clean material for stream morphologic changes over time (e.g., bank cutting, bar formation, accretion, meandering, terracing, and braiding).
12. Implement a remedy that allows the channel and floodplain to remain dynamically stable in all flow conditions (low flow, flooding and ice conditions).

1. Protective of human health and the environment

- RAO is not specific
- How would “protectiveness” be defined (i.e., weight of evidence?)

Recommendation:

- Eliminate from RAO list; address with other more specific RAOs

2. Eliminate water quality impacts of contaminants of concern (COCs), including dissolved phase, sheen and NAPL blebs

- RAO should focus on addressing NAPL/sheens
- Dissolved-phase water quality impacts have not been identified
 - Low-level COCs detected in 1996 surface water samples
 - COCs not detected in 1999 surface water samples
 - HHERA showed no unacceptable human health or ecological risks associated with exposures to surface water

Recommendation:

- Potential modified RAO:
Mitigate the potential for NAPL and sheen generation within, and/or discharge to, the Tributary and Crawford Creek

3. Eliminate direct exposure to COCs in creek and floodplain

- “Eliminate” is overly restrictive and not practical
- Exposure to what receptors is not defined
- As written, restricts range of alternatives

Recommendation:

- Potential modified RAO:
Minimize the current and/or future potential for direct exposure by human and ecological receptors to COCs in Tributary/Crawford Creek sediment and floodplain materials

4. Eliminate future exposure and transport of COCs

- “Eliminate” is overly restrictive
- “Exposure” addressed by RAO #3
- As written, restricts range of alternatives

Recommendation:

- Potential modified RAO:
Minimize the potential for the transport of COCs within the Tributary/Crawford Creek Site

5. Minimize future institutional controls on properties not owned by Beazer

- Short of complete removal (which we've discussed and agreed is not feasible), some level of institutional controls will be necessary. It is unclear how other alternatives might minimize future institutional controls.

Recommendation:

- Requires further discussion/clarification

6. No hard structures within creek and floodplain

- Not consistent with RAO definition
 - Not necessary to protect human health/environment
- Possible design criteria
- “No” hard structures is restrictive; may be necessary for erosion control and future stability

Recommendation:

- Eliminate from RAO list; address as needed during design (TBD)

7. Eliminate discharge of NAPL phase COCs from fractures and/or NAPL saturated layers or seams

- Redundant with and covered by RAO #2

Recommendation:

- Eliminate from RAO list
- Modified RAO #2:
Mitigate the potential for NAPL and sheen generation within, and/or discharge to, the Tributary and Crawford Creek

8. Allow the creek to meander within the floodplain

- Not consistent with RAO definition
 - Not necessary to protect human health/environment
- Possible design criteria

Recommendation:

- Eliminate from RAO list; address as needed during design (TBD)

9. Keep the connection (hydrologic, biologic) of the stream, bank, and floodplain

- Although all alternatives would achieve this, it is not consistent with RAO definition
 - Not necessary to protect human health/environment
- Possible design criteria

Recommendation:

- Eliminate from RAO list; address as needed during design (TBD)

10. Maintain a natural channel as close as possible in form and dimensions to the existing channel

- Although all alternatives would achieve this, it is not consistent with RAO definition
 - Not necessary to protect human health/environment
- Possible design criteria

Recommendation:

- Eliminate from RAO list; address as needed during design (TBD)

11. Restore conditions such that banks and floodplain are free of COCs to an adequate depth so as to provide clean material for stream morphologic changes over time (e.g., bank cutting, bar formation, accretion, meandering, terracing, and braiding)

- Not consistent with RAO definition
 - Not necessary to protect human health/environment
- Limits alternatives to “big dig” options

Recommendation:

- Eliminate from RAO list; include an alternative that achieves these criteria

12. Implement a remedy that allows the channel and floodplain to remain dynamically stable in all flow conditions (low flow, flooding and ice conditions).

- Unclear what “dynamically stable” means
- Not consistent with RAO definition
 - Not necessary to protect human health/environment
- Possible design criteria
- Generally covered by RAOs #3 and 4

Recommendation:

- Eliminate from RAO list; address as needed during design (TBD)

Beneficial Use Impairment (BUI) Goals

- July 2013 SLRAOC Implementation Framework: Roadmap to Delisting (Remedial Action Plan Update) (LimnoTech 2013)
 - Identifies BUI 9 (Loss of Fish and Wildlife Habitat) for the Site
 - States that remediation of contaminated sediments and restoration of habitat within stream, wetland, and floodplain areas is needed to achieve removal of BUI 9
- While there is no link between impacted sediments and floodplain materials within the Site and any actual loss of fish and wildlife habitat, it is anticipated that implementation of a selected remedy will facilitate removal of BUI 9 for the Site
- Proposed RAO:
Facilitate removal of BUI 9

Summary of Proposed/Modified RAOs

- Mitigate the potential for NAPL and sheen generation within, and/or discharge to, the Tributary and Crawford Creek
- Minimize the current and/or future potential for direct exposure by human and ecological receptors to COCs in Tributary/Crawford Creek sediment and floodplain materials
- Minimize the potential for the transport of COCs within the Tributary/Crawford Creek Site
- Facilitate removal of BUI 9

Action Items/Next Steps/Schedule