Endsley, Erin A - DNR

From: Endsley, Erin A - DNR
Sent: Monday, November 18, 2013 10:58 AM
To: Shafel, Kathleen S - DNR (Kathleen.Shafel@wisconsin.gov); Lundquist, Greer I - DNR
Subject: Case Closure, Enbridge Energy Tank 23, 02-16-558989

Hello Kathleen and Greer –

I previously forwarded the case closure letter for this site. I have the BRRTS tracking updated on my tracking sheet. The GIS packet is saved here:
\\rhinelan\rr\ GIS PACKETS\02-16-558989 Enbridge Energy Tank 23

The file and the hard copy GIS (blue folder and disk) are on their way to Rhinelander for filing and processing.

If you have any questions, please let me know.

Thanks!

Erin

Erin Endsley
Hydrogeologist
Northern Region
Remediation and Redevelopment
1701 N 4th St, Superior, WI 54880
Wisconsin Department of Natural Resources
ph: 715/392-3126
e-mail: erin.endsley@wisconsin.gov

We are committed to service excellence. Click here to evaluate how I did.

Kathleen –
please file once Greer is
done w GIS packet.
Thanks!
Erin

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Superior Service Center
1701 N. 4th Street
Superior WI 54880

COPY

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN DEPT. OF NATURAL RESOURCES

November 18, 2013

Karl Beaster
Enbridge Energy
1320 Grand Avenue
Superior WI 54880

KEEP THIS DOCUMENT WITH YOUR PROPERTY RECORDS

SUBJECT: Final Case Closure with Continuing Obligations
Enbridge Energy – Tank 23, Superior, WI
WDNR BRRTS Activity #: 02-16-558989

Dear Mr. Beaster:

The Department of Natural Resources (DNR) considers the Enbridge Energy – Tank 12 site closed, with continuing obligations. No further investigation or remediation is required at this time. However, you and future property owners must comply with the continuing obligations as explained in the conditions of closure in this letter. Please read over this letter closely to ensure that you comply with all conditions and other on-going requirements. Provide this letter to anyone who purchases this property from you.

This final closure decision is based on the correspondence and data provided, and is issued under ch. NR 726, Wisconsin Administrative Code. The DNR Northern Region (NOR) Closure Committee reviewed the request for closure on November 11, 2013. This environmental remediation case was reviewed for compliance with state laws and standards.

The site consists of historical impacts of diesel fuel and crude oil that were discovered during tank upgrade work. These impacts exist in the soil below and around the tank floor and the tank ring road. The clean-up included excavation of the petroleum-impacted soil. Confirmation sampling was done to confirm the degree and extent of contamination. The conditions of closure and continuing obligations required were based on the property being used for industrial purposes.

Continuing Obligations

The continuing obligations for this site are summarized below. Further details on actions required are found in the section Closure Conditions.

- Residual soil contamination exists that must be properly managed should it be excavated or removed.
- If a structural impediment that obstructed a complete site investigation or cleanup is removed or modified, additional environmental work must be completed.

- Industrial soil standards were applied for closure, and industrial zoning is required. Before the land use may be changed from industrial to non-industrial, additional environmental work must be completed.

The DNR fact sheet, "Continuing Obligations for Environmental Protection", RR-819, helps to explain a property owner's responsibility for continuing obligations on their property. The fact sheet may be obtained at http://dnr.wi.gov/files/PDF/pubs/rr/RR819.pdf.

GIS Registry

This site will be included on the Bureau for Remediation and Redevelopment Tracking System (BRRTS on the Web) at http://dnr.wi.gov/topic/Brownfields/rrsm.html, to provide public notice of residual contamination and of any continuing obligations. The site can also be viewed on the Remediation and Redevelopment Sites Map (RRSM), a map view, under the Geographic Information System (GIS) Registry layer, at the same web address.

DNR approval prior to well construction or reconstruction is required for all sites shown on the GIS Registry, in accordance with s. NR 812.09 (4) (w), Wis. Adm. Code. This requirement applies to private drinking water wells and high capacity wells. To obtain approval, complete and submit Form 3300-254 to the DNR Drinking and Groundwater program's regional water supply specialist. This form can be obtained on-line at http://dnr.wi.gov/topic/wells/documents/3300254.pdf.

All site information is also on file at the NOR Regional DNR office, at 107 Sutliff Avenue, Rhinelander. This letter and information that was submitted with your closure request application, including any maps, can be found as a PDF in BRRTS on the Web.

Closure Conditions

Compliance with the requirements of this letter is a responsibility to which you and any subsequent property owners must adhere. DNR staff will conduct periodic prearranged inspections to ensure that the conditions included in this letter are met. If these requirements are not followed, the DNR may take enforcement action under s. 292.11, Wisconsin Statutes to ensure compliance with the specified requirements, limitations or other conditions related to the property.

Residual Soil Contamination (ch. NR 718, chs. 500 to 536, Wis. Adm. Code or ch. 289, Wis. Stats.)
Soil contamination remains beneath Tank 23, near the tank foundation, and beneath the tank ring road, as indicated on the attached map (Figure B.2.c – Tank 23 Pre/Post Remaining Soil Contamination, June 2013). If soil in the specific locations described above is excavated in the future, the property owner at the time of excavation must sample and analyze the excavated soil to determine if contamination remains. If sampling confirms that contamination is present, the property owner at the time of excavation will need to determine whether the material is considered solid or hazardous waste and ensure that any storage, treatment or disposal is in compliance with applicable standards and rules. Contaminated soil may be managed in accordance with ch. NR 718, Wis. Adm. Code, with prior DNR approval.

In addition, all current and future owners and occupants of the property need to be aware that excavation of the contaminated soil may pose an inhalation or other direct contact hazard and as a result special precautions may need to be taken to prevent a direct contact health threat to humans.

Depending on site-specific conditions, construction over contaminated soils or groundwater may result in vapor migration of contaminants into enclosed structures or migration along newly placed underground utility lines. The potential for vapor inhalation and means of mitigation should be evaluated when planning any future redevelopment, and measures should be taken to ensure the continued protection of public health, safety, welfare and the environment at the site.

Structural Impediments (s. 292.12 (2) (b), Wis. Stats., s. NR 726.15, s. NR 727.07, Wis. Adm. Code)
Tank 23 and the surrounding tank ring road, as shown on the attached map (Figure B.2.c – Tank 23 Pre/Post Remaining Soil Contamination, June 2013) made complete investigation and/or remediation of the soil contamination on this property impracticable. If the structural impediment is to be removed, the property owner shall notify the DNR at least 45 days before removal, and conduct an investigation of the degree and extent of type of contaminant contamination below the structural impediment. If contamination is found at that time, the contamination shall be properly remediated in accordance with applicable statutes and rules.

Industrial Soil Standards (s. NR 726.15, s. NR 727.07, Wis. Adm. Code)
Soil contamination remains beneath Tank 23, near the tank foundation, and beneath the tank ring road, as shown on the attached map (Figure B.2.c – Tank 23 Pre/Post Remaining Soil Contamination, June 2013). Sample Tk23-HIS-B1 contained benzo(a)pyrene in concentrations which exceeded non-industrial (residential) soil standards, but which met industrial soil standards.

This property may not be used or developed for a residential, commercial, agricultural or other non-industrial use, unless prior written approval has been obtained from the DNR. An investigation and remedial action to meet applicable soil cleanup standards may be required at that time.

Please be aware that the case may be reopened pursuant to s. NR 726.09, Wis. Adm. Code, if additional information regarding site conditions indicates that contamination on or from the site poses a threat to public health, safety, or welfare or to the environment.

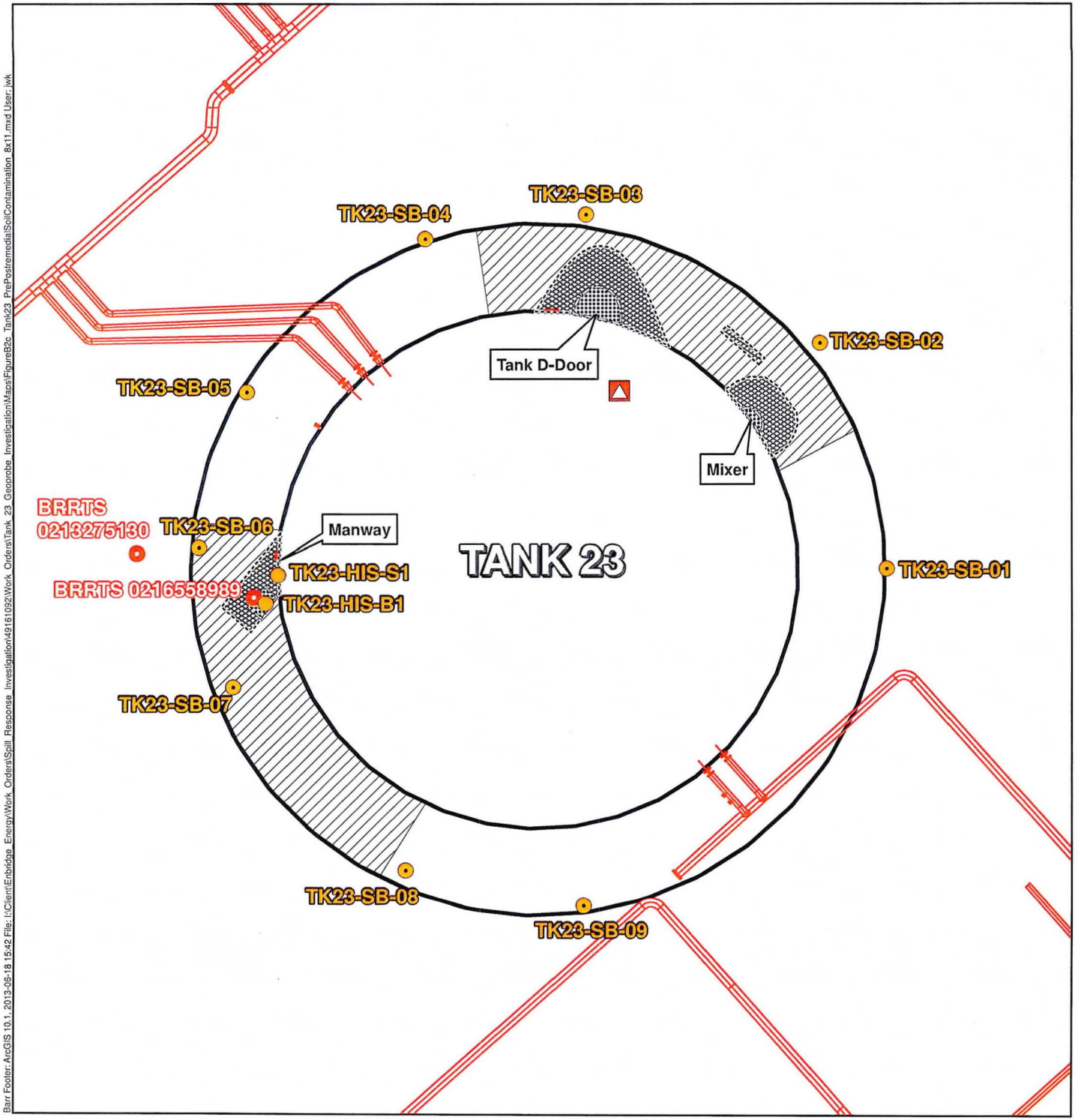
The DNR appreciates your efforts to restore the environment at this site. If you have any questions regarding this closure decision or anything outlined in this letter, please contact Erin Endsley at 715-392-3126 or via email at erin.endsley@wisconsin.gov.

Sincerely,

John Robinson
Northern Region Team Supervisor
Remediation & Redevelopment Program

Attachments: Figure B.2.c – Tank 23 Pre/Post Remaining Soil Contamination, June 2013

cc: Lynette Carney, Barr Engineering



ENBRIDGE SUPERIOR TERMINAL

- Geoprobe Borings
- Analytical Samples
- Approximate Tank Bottom Cut Out Location
- Documented Historical Releases
- Field Screened Area
- Impacted Soil - Post-Remedial Excavation
- Impacted Soil - Pre-Remedial Excavation
- Road Boundary
- Pipeline Infrastructure
- Terminal Property Boundary

N

0 50 100

Feet

1 Inch = 50 Feet

Figure B.2.c.

TANK 23 PRE/POST REMAINING SOIL CONTAMINATION SUPERIOR TERMINAL

Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: November 4, 2013

TO: John Robinson – Wausau, Chris Saari – Ashland, Connie Lefebvre – Woodruff, Kathleen Shafel – Antigo

FROM: Erin Endsley – Superior

SUBJECT: Enbridge Energy – Tank 23, 02-16-558989

Consultant: Lynette Carney, Barr Engineering

Recommendation:
_x_ Approval
__ Denial
__ Pause for Corrections

Yet to be Completed:
__ Enforcement
__ Permits

Closure Conditions (84):
__ Monitoring Well Abandonment
__ Removal of Soil Piles/Purge Water

Continuing Obligations (56):
_x_ Soil at Industrial Use (220)
__ Maintain Cap (222)
_x_ Structural Impediment (224)
__ Vapor Intrusion (226) Option(s) _____
__ Site Specific Condition (228)
__ Maintain LGU Exemption (230)
__ Maintenance/Inspection Report Required (238)
_x_ Residual Soil Exceeds Standards (232)
__ Residual GW Exceeds Standards (236)
__ MW Needs Abandonment (234) Option _____

Recommendation Summary:

Releases of diesel fuel from tank cleaning and releases of crude oil from the tank ports resulted in soil impacts around the perimeter of the tank and below the tank floor. Contamination appears to be limited to gravel fill below the ring road and in sand and gravel fill below the tank. Investigation activities consisted of field screening, two samples adjacent to tank ports, and nine borings (10-15' deep) advanced around perimeter of tank. Groundwater and free product were not encountered or observed during site investigation. The tank floor and the infrastructure surrounding the tank limited full investigation of the releases, so the site will have a continuing obligation for a structural impediment at the time of closure. The photos in attachment C.6 give a good visual of the impacted soil relative to the tank and associated infrastructure.

Remedial actions consisted of limited excavation, including 540 cy of contaminated soil from the ring road, and approximately 1 cy yard of contaminated soil from the fill below the tank. Contaminated soil was left in place where further excavation would have threatened tank stability, and also where it was inaccessible below the tank. For the soil remaining in place, one location (TK23-HIS-B1) has industrial d-c exceedances for several PAHs, at a depth of 2.2' bgs. Another location (TK23-Floor Repair-1) has GW Pway exceedances for TMBs and xylene. Most other sampling locations did not have detections. The cumulative risk assessments did not result in the HQ or the CCR being exceeded for any samples.

I think the various pathways have been addressed, the degree and extent adequately defined (given site conditions), and recommend closure with soil GIS, structural impediment, and industrial soil standards as the continuing obligations for the site.

Conditional Closure Review - **APPROVAL**

SITE NAME: **Enbridge Energy - Tank 23** BRRTS #: **02-16-558989** Date Reviewed: **Nov 4, 2013**

Committee Review #: 1

☑	CLS LTR	Action Code	Condition	Comments
☐			Approved with - No Continuing Obligations	
☐			Submit to GIS Staff for GIS Location Confirmation	
☐		84	Conditional Closure	
☐			MW Abandonment Needed	
☐			Document Engineered System Abandonment/Dismantle	
☐			Soil/GW Considered to be Background Concentration	
☑		56	Continuing Obligations at Closure	
☐	1	236	GW >NR140 ES	
☑	2	232	Soil Contamination Remains ◉ >RCL ◉ DC ◉ GW ○ EPA Calculator ○ DC ○ GW	
☐	2	232 & 55	○ SSRCL* ○ DC ○ GW *NR 720.19 Soil Standard Closure	
☐		234	Monitoring Well Abandonment	
☐	3A		A - MW was not Located (LOST)	
☐	3B		B - Continued Use of MW Requested/Approved	
☐	3C		C - Continued Monitoring Required	
☐	3D	334	MW Responsibility Transferred to Another Site BRRTS #: _____	
☑			No Maintenance Plan Required	
☐		222	Maintenance Plan Required (Multiple Options)	
☐	4A		Cap Impervious Required for Soil to GW Pathway	
☐	4A		Cap Impervious Required for DC Protection	
☐	4B		Cap Engineered for GW Protection & DC	
☐	4C		Cap Pervious or Impervious Required for DC only	
☐	4D		Barrier Installed to Prevent Vapor Intrusion	
☐		238	Submittal of Maintenance/Inspection Report Required	
☑	5	224	Structural Impediment	
☑		220	Industrial Zoning/Land Use	
☑	6A	220	Soil Meets Industrial Standards	
☐	6B	220	Soil Meets SS Industrial RCL	
☐		226	Vapor Mitigation (Multiple Options)	
☐	7A		A - Exceed Vapor Risk Levels - Mitigation Required ☐ Maintenance Plan Required	
☐	7B		B - Compound of Concern - Property Use Restriction	
☐	7C		C - Hydrogeologic Concerns - Mitigation Required ☐ Maintenance Plan Required	
☐	7D		D - Site Specific Exposure - Property Use Restriction	
☐	7E		E - Future Redevelopment - Notification Requested	

SITE NAME: **Enbridge Energy - Tank 23** BRRTS #: **02-16-558989** Date Reviewed: **Nov 4, 2013**

Committee Review #: 1

☑	CLS LTR	Action Code	Condition	Comments
☐	8	228	Site Specific Condition (fence, methane, & monitoring)	
☐			Offsource Property	
☐			Notification Letter (Source Property Owner Different than RP) ○ Soil ○ GW ○ VI	
☐			Notification Letter ○ Soil ○ GW ○ VI	
☐			Notification Letter ○ Soil ○ GW ○ VI	
☐			Notification Letter ○ Soil ○ GW ○ VI	
☐			ROW - Notification Letter ○ Soil ○ GW ○ VI	
☐		48	NR 140 Exemption	
☐			A - Public Health Concern (Not Nitrate) - Background Concentration < PAL	
☐			B - Public Welfare or Nitrate	
☐			C - Public Health (Not Nitrate) Background Concentration between PAL & ES or above ES	
			Other Items	
☐		400	Transfer to WMM	
☐			Residual Soil as Solid Waste	
☐			General Wastewater Permits for Construction Related GW Activities	
☐			PECFA Reimbursement	
☐			Operating Dry Cleaners	
☐			Contamination Handled Under BRRTS #: _____	
☐		550	Open Phantom Case	
☐			VPLE Insurance Needed	
☐			Other Comments	

Closure Committee Signatures

Member (Sup)

Member

Member

Member

Other _____

VPLE Concurrence

Project Manager Closure Recommendation

SITE NAME: **Enbridge Energy - Tank 23** BRRTS #: **02-16-558989** PM: **Endsley**

Project Manager (Complete Prior to Committee Meeting) **Date Submitted:** Nov 4, 2013

Committee Review #: 1

Reset Form

DERF/VPLE Review: ☑ Not Applicable ☐ DERF ☐ VPLE

Impacts: ☐ GW ☑ Soil ☐ Offsource ☐ ROW ☐ Vapor Intrusion Pathway

High Risk Impact: _____ **High Risk Impact:** _____

High Risk Impact: _____ **Other:** _____

☐ Co-Contamination _____

Substance:

Crude Oil

Diesel Fuel

Project Manager Opinion: ☑ Approval ☐ Denial

If approval is recommended, list all:

Soil Impacts (e.g. B100 > RCL DC & GW Protection; Boring B1400 > RCL DC; Cover Requirements; etc.)

☒ **Soil GIS Fee**

For the soil remaining in place, one location (TK23-HIS-B1) has industrial d-c exceedances for several PAHs, at a depth of 2.2' bgs. Another location (TK23-Floor Repair-1) has GW Pway exceedances for TMBs and xylene.

Vapor Impacts/Mitigation (e.g. Mitigation; Use Restriction; Notifications; etc.)

NA

GW Impacts (e.g. MW 12 > ES; MW10 > PAL; MW4 - Lost/Transferred (to whom); etc.)

☐ **GW GIS Fee**

NA

Verified in BRRTS (Check box when completed)

☒ Fees ☐ Acres for Reuse ☐ Energy Act ☒ Impact ☒ Risk ☒ Substance ☐ Enforcement End

Enbridge Pipelines (Lakehead) L.L.C.
Environment Department
1320 Grand Avenue
Superior, WI 54880
Tel 715 394 1400
Fax 715 394 1500

www.enbridgepartners.com

Shane Yokom	Manager, Environment Operations
Joseph Peterson	Supervisor, Region Operations
Cheryl Urie	Supervisor, Programs
Jim Snider	Environmental Specialist
Rhonda O'Leary	Sr. Air Compliance Specialist
James Anklam	Sr. Environmental Analyst
Karl Beaster	Environmental Analyst II
Stacey Frerich	Environmental Analyst II
Derek Senn	Environmental Analyst II
Kelli Nelson	Environmental Analyst
Bryan Sederberg	Environmental Analyst
Alex Smith	Environmental Analyst
Greg St. Onge	ER Preparedness Coordinator
Julie O'Brien	Environmental Assistant

October 15, 2013

Erin Endsley
Wisconsin Department of Natural Resources - Northern Region
Remediation and Redevelopment
1701 N 4th St
Superior, WI 54880

Re: Case Closure Request
Enbridge Energy - Tank 23
Enbridge Energy Superior Terminal
Superior, Wisconsin

Dear Ms. Endsley:

Please find attached report regarding the clean-up of historical crude oil impacts discovered during the Tank 23 upgrade project work. Based on the findings presented in this report, we are requesting no further action in regards to this historical release.

Please find enclosed Enbridge check #1111144788 in the amount of $950.00 to cover the WDNR's review fee and GIS fee. Please call me if you have any questions or comments.

Sincerely,
Enbridge Energy

Karl F. Beaster, P.G.
Environmental Analyst

Enclosure

cc: Mr. Ryan Erickson, Barr Engineering

State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Case Closure - GIS Registry

SUBMIT AS UNBOUND PACKAGE IN THE ORDER SHOWN

Notice: Pursuant to ch. 292, Wis. Stats., and chs. NR 726 and 746, Wis. Adm. Code, this form is required to be completed for case closure requests. The closure of a case means that the Department of Natural Resources (DNR) has determined that no further response is required at that time based on the information that has been submitted to the DNR. All sections of this form must be completed unless otherwise directed by the Department. Incomplete forms will be considered "administratively incomplete" and processing of the request will stop until required information is provided. Any section of the form not relevant to the case closure request must be fully filled out or explained on a separate page and attached to the relevant section of this form. DNR will consider your request administratively complete when the form and all sections are completed, all attachments are included, and the applicable fees required under ch. NR 749, Wis. Adm. Code, are included, and sent to the proper destinations. Personal information collected will be used for administrative purposes and may be provided to requesters to the extent required by Wisconsin's Open Records Law (ss. 19.31 - 19.39, Wis. Stats.).

Site Information

BRRTS No.	Parcel ID No.		
02-16-558989	08-808-10046-00; 01-801-05131-00		
BRRTS Activity (Site) Name	**WTM Coordinates**		
	X	Y	
Enbridge Energy - Tank 23	362148	692142	
Street Address	**City**	**State**	**ZIP Code**
2800 E. 21st St.	Superior	WI	54880

Responsible Party (RP) Name			
Karl Beaster			
Company Name			
Enbridge Energy Limited Partnership			
Street Address	**City**	**State**	**ZIP Code**
1320 Grand Ave	Superior	WI	54880
Phone Number	**Email**		
(715) 398-4754	karl.beaster@enbridge.com		

☒ Check here if the RP is the owner of the source property.

Environmental Consultant Name			
Lynette Carney			
Consulting Firm			
Barr Engineering			
Street Address	**City**	**State**	**ZIP Code**
332 W. Superior Street, Suite 600	Duluth	MN	55802
Phone Number	**Email**		
(218) 529-7141	lcarney@barr.com		
Acres Ready For Use	Voluntary Party Liability Exemption Site? ○ Yes ◉ No		

Fees and Mailing of Closure Request

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form. All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

1. **Send a copy of page one** of this form and the applicable ch. NR 749, Wis. Adm. Code, fee(s) to the DNR regional Environmental Program Associate at **http://dnr.wi.gov/topic/Brownfields/Contact.html**. Check all fees that apply:

   ☒ $750 Closure Fee

   ☒ $200 GIS Registry Fee for Soil

   ☐ $250 GIS Registry Fee for Groundwater Lost Well(s)

   Total Amount of Payment $ $950.00

2. **Send one paper copy and one e-copy on compact disk of the entire closure package** to the Regional Project Manager assigned to your site. Submit as *unbound, separate documents* in the order and with the titles prescribed by this form. For electronic document submittal requirements, see **http://dnr.wi.gov/files/PDF/pubs/rr/RR690.pdf**.

Site Summary

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form. All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

1. General Site Information and Site History

A. **Site Location**: Describe the physical location of the site, both generally and specific to its immediate surroundings.
The terminal operated by Enbridge Energy Limited Partnership is located at 2800 East 21st Street, Superior, Douglas County, Wisconsin (Figure B.1.a). The site township, range and section is T49N, R14W, S36, NE, SW (Figure B.1.a). Tank 23 is located in a 400 foot by 400 foot by 8 foot high containment basin on the west side of the terminal (Figure B.1.b). The surrounding land use is industrial, including oil refining and natural gas storage facilities at adjacent properties.

B. **Prior and current site usage**: Specifically describe the current and historic occupancy and types of use.
Enbridge (formerly known as Lakehead Pipeline) expanded an oil pipeline system from Canada to their existing Superior Terminal property in 1950. The Lakehead Pipeline name changed to Enbridge in or around 1991. The terminal operates as a crude oil pipeline pumping facility and storage facility for product pumped southeast from North Dakota and Canada to Chicago and Detroit. Enbridge currently operates 40 storage tanks at their Superior facility.

C. Describe how and when site contamination was discovered.
1) Tank 23 road construction: Crude oil contaminated soil was discovered around Tank 23 during a ring road construction project in April of 2012.

2) Tank 23 floor cut-out: Diesel fuel contaminated construction fill was discovered in a Tank 23 tank maintenance floor cut-out in January of 2013.

D. Describe the type(s) and source(s) or suspected source(s) of contamination.
1) Tank 23 road construction: Three locations with crude oil contaminated soil were identified around the perimeter of the tank during tank ring road construction. All three locations were adjacent to tank access ports (Manway, D-door, Mixer) (Figure B.2.a). Enbridge believes that the crude oil contamination is from releases during historical tank activity and maintenance work.

2) Tank 23 floor cut-out: Diesel fuel contaminated soil was The soil beneath Tank 23 is contaminated by diesel fuel. Diesel fuel is used to clean crude oil storage tanks. Enbridge believes that the diesel fuel contaminated fill discovered in the 2013 tank maintenance floor cut-out (Figure B.2.a) is associated with holes identified in the Tank 23 floor during maintenance activities in the 1980's. Enbridge does not believe that the impacts are recent because no holes in the tank bottom were discovered during the 2012-2013 maintenance work.

E. Other relevant site description information (or enter Not Applicable).
Not applicable.

F. List BRRTS activity site name and number for all other BRRTS activities at this property, including closed cases.
BRRTS activity for the Enbridge Superior Terminal Tank 23 Containment Basin:
- Lakehead Pipeline Tank 23: 0216275130 (Figure B.2.a). Closed on 2/21/2007.
- Additional Terminal BRRTS sites shown on Figure B.1.c.

G. List BRRTS activity/site name(s) and number(s) for all properties immediately adjacent to this site, and those impacted by contamination from this site.
See Figure B.1.c for adjacent BRRTS sites.
- Lakehead Pipeline Tank 23 (0216275130) is adjacent to this site (Figure B.2.a) and soil with a benzo(a)pyrene excedence was left in place to the east of Tank 23. However residual contamination appears to be outside the ring road boundaries so it is unclear whether the contamination discovered during construction activities is related.

H. **Current zoning** (e.g. industrial, commercial, residential) for the site and for neighboring properties, and how verified (Provide documentation in Attachment G).
The site is zoned Manufacturing District 2 Figure G.3.). The Calumet oil refinery is located to the northwest across East 21st Street. The Dome Petroleum natural gas facility is located immediately to the north of the Enbridge Energy Superior Terminal. The Nemadji River is located immediately to the south and east of the facility.

2. General Site Conditions

A. Soil/Geology

i. Describe soil type(s) and relevant physical properties, thickness of soil column across the site, vertical and lateral variations in soil types.
Surficial geology in the area consists of a glacial-lacustrine clay deposit that is approximately 150 feet thick (USGS Hydrologic Investigation Atlas HA-524, Water Resources of Wisconsin Lake Superior Basin). Sandy hardpan geological units have been observed in local wells (VE161 and VH933) at approximately 140 feet below ground surface (bgs).

ii. Describe the composition, location and lateral extent, and depth of fill or waste deposits on the site.
1) Tank 23 road construction: The gravel ring road around Tank 23 consists of gravel roadbed material overlying a geotechnical fabric. The road bed is approximately two feet deep by 30 feet wide (Figure B.3.a).

2) Tank 23 floor cut-out: Construction fill beneath tank consists of approximately 0.5 feet of sand that is overlying 0.5 feet of gravel that is overlying fat clay (Figure B.3.a).

iii. Depth to bedrock, bedrock type, and whether or not it was encountered during the investigation.
Bedrock is approximately 150 feet bgs and consists of sandstone of the Precambrian Bayfield Formation (USGS Hydrologic Investigations Atlas HA-524, Water Resources of Wisconsin Lake Superior Basin, 1974). Bedrock was not encountered in this investigation.

iv. Describe the nature and locations of current surface cover(s) across the site (e.g. natural vegetation, landscaped areas, gravel, hard surfaces, and buildings).
Tank 23 is an approximately 180 foot diameter steel crude oil storage tank. The tank is located in the bottom of a tank containment basin (400 feet wide by 400 feet wide by 8 feet tall) (Figure B.1.b). The ground surface in the bottom of the basin is clay with little to no vegetation. The clay basin berms are covered in grass. Tank 23 is surrounded by a 30 foot wide gravel ring road with access roads in the north and west basin corners. Aboveground feeder pipelines are located on the northwest and southeast sides of the tank and buried cathodic lines are located around the perimeter of the tank.

B. Groundwater

i. **Discuss depth to groundwater and piezometric elevations**. Describe and explain depth variations, and whether free product affects measurement or water table elevation. Describe the stratigraphic unit(s) where water table was found or which were measured for piezometric levels.
The estimated groundwater depth in the Tank 23 containment basin area varies between 7 and 9 feet bgs based on groundwater measurements taken during periodic sampling of monitoring well MW-6. MW-6 is located downgradient of Tank 23 (Figure B.3.c). No water or product were observed in the 10-15 foot deep Tank 23 Geoprobe borings. The water table is located in a fat glacial/lacustrine clay.

ii. Discuss groundwater flow direction(s), shallow and deep. Describe and explain flow variations, including fracture flow if present.
Shallow groundwater flow from the Tank 23 basin is to the southeast based on the groundwater depths measured during annual terminal monitoring well sampling (Figure B.3.c). Water levels in shallow site monitoring wells are also at higher elevations than water levels in the deep water supply wells completed in hard pan and/or silty sand soil 140 to 150 feet bgs. The water levels in the deep water supply wells are also lower than surface water features. This indicates that the vertical groundwater gradient is downward, which is common where material with a low hydraulic conductivity overlies material with a higher hydraulic conductivity.

iii. Discuss groundwater flow characteristics: hydraulic conductivity, flow rate and permeability, or state why this information was not obtained.
Hydraulic conductivity for a clay is between 0.000000001 and 0.000000000001 m/sec (Freeze and Cherry, 1979).

iv. Identify and describe locations/distance of potable and/or municipal Wells within 1200 feet of the site.
Two Enbridge potable wells are located in upgradient maintenance buildings to the north-north-east of Tank 23 approximately 800 feet and 1100 feet away (Figure B.1.b).

3. Site Investigation Summary

A. General

i. Provide a brief summary of the site investigation history. Reference previous submittals by name and date. Describe site investigation activities undertaken since the last submittal for this project and attach the appropriate documentation in Attachment C, if not previously provided.
1) Tank 23 road construction: (April 2012) During road construction activities, the excavation extents were field screened for headspace and hydrocarbon odor, sheen and discoloration using standard operating procedures. Three crude oil impacted areas were identified adjacent to Tank 23 access ports (Figure B.2.a). The extents of residual crude oil impacted soil near the northwest manway was identified and defined through field screening (Figures C.1.a.i - iii). Two analytical samples (TK23-HIS-B1 and TK23-HIS-S1) were collected from the residual impacted soil near the northwest manway and submitted to Pace Analytical for analysis of: diesel range organics (DRO), petroleum volatile organic compounds (PVOCs), and polycyclic aromatic hydrocarbons (PAHs). Residual crude oil impacts in the other two Tank 23 areas (northern D-door and eastern mixer) were defined through field screening and no analytical samples were collected. Field screening results are summarized in Figures C.1.a.i-iii.

2) Tank 23 maintenance floor cut-out: (January 2013) Diesel fuel impacted fill was discovered beneath the tank during tank floor maintenance activities. The one foot deep sand and gravel fill exposed in the 12 foot by 14 foot floor cut-out was field screened for headspace and hydrocarbon odor, sheen and discoloration using standard operating procedures (Figure C.1.a.iv). An analytical soil sample was collected and submitted to Pace for analysis of DRO, gasoline range organics (GRO), and PVOCs for investigation and waste characterization purposes. Field screening results are

summarized in Figures C.1.a.iv.

3) Tank 23 Geoprobe investigation: (March 2013) Nine 10-15 foot deep borings were advanced around the perimeter of the tank to determine if hydrocarbon contamination was present in the soil (Figure B.2.a). Recovered soil samples were described using the ASTM method and field screened for headspace and hydrocarbon odor, sheen and discoloration using standard operating procedures (Figure C.1.). At least one analytical soil sample was collected per boring from above the water table and submitted to Pace for analysis of DRO, GRO and PVOCs and a total of 10 samples were run (Table A.2).

ii. Identify whether contamination extends beyond the source property boundary, describe the off-site media (e.g., soil, groundwater, etc.) impacted, and the vertical and horizontal extent of off-site impacts.

No hydrocarbon impacts are believed to extend out from the immediate Tank 23 perimeter based on the physical characteristics of the native clay, the observations made during road excavation activities and the results from the Tank 23 Geoprobe investigation.

iii. Identify any structural impediments to the completion of site investigation and/or remediation and whether these impediments are on the source property or off the source property. Identify the type and location of any structural impediment (e.g., structure) that also serves as the performance standard barrier for protection of the direct contact or the groundwater pathway.

Excavation activity immediately around Tank 23 is limited to protect the tank structural integrity and the buried and aboveground tank and pipeline infrastructure (cathodic lines, feeder pipes, cat walks). Tank 23 also serves as the direct contact barrier to the diesel fuel contamination discovered in the fill beneath the tank floor.

B. Soil

i. Describe degree and extent of **soil contamination** at and from this site. Relate this to known or suspected sources and known or potential receptors/migration pathways.

1) Tank 23 road construction: Historical crude oil contaminated soil was identified in three locations around the perimeter of Tank 23 adjacent to tank ports (manway, D-door, mixer) during the ring road construction as shown in Figure B.2.a. Contamination depth varied but was generally between 0 and 2 feet bgs. Contamination immediately below the D-door was observed to 7 feet bgs but was shallower further away from the tank. During the road excavation, crude oil contaminated soil was observed up to 25 feet out from the tank but never exceeded the width of the road excavation. The road excavation provided an excellent opportunity to identify the lateral extent of contamination from these release points. Vertical definition was not achieved in the areas with residual impacts (Figure B.2.b) because the excavation depth was typically limited by construction objectives and safety concerns associated with buried infrastructure. Enbridge indicated that the crude oil contaminated soil originated from releases from the tank ports during historical tank maintenance projects.

2) Tank 23 floor cut out: Diesel fuel contaminated fill was exposed during 2013 Tank 23 maintenance work in a 12 x 14 foot tank floor cut out. The contaminated fill material consisted of sand and gravel fill approximately one foot deep overlying clay. The vertical definition of the contamination was not defined due to frozen ground conditions. The horizontal extent of the impacts could not be determined because of the limited size of the floor cut-out. Enbridge indicated that they believe the diesel fuel impacts originated from a historical (1980's) tank cleaning and maintenance project where holes were detected in the tank bottom. Enbridge came to this conclusion because: 1) diesel fuel is used in one of the tank cleaning stages; and 2) no holes were detected in the tank bottom during 2013 maintenance work.

3) Tank 23 Geoprobe investigation: No soil contamination was detected during the Geoprobe investigation with field screening methods or laboratory analyses (Figures B.2.a. and C.1.; Table A.2). Based on the Geoprobe investigation results, it can be concluded that no hydrocarbon impacts are migrating through the soil away from Tank 23.

No soil receptors or migration pathways were identified during construction excavation and investigation activities around the perimeter of Tank 23.

ii. Describe the level and types of **soil contaminants** found in the upper four feet of the soil column.

1) Tank 23 road construction: The historically contaminated soil observed in the road construction excavation exhibited petroleum staining, a petroleum odor and elevated headspace readings (up to 794 ppm). Specific location descriptions are listed below:

- Western manway (Figures B.2.c, C.1.a.i.): Crude oil contaminated soil in this location had elevated headspace detections, dark discoloration and a petroleum odor. Most of the contaminated soil was located between 0 and 2 feet bgs and was removed during the construction excavation. Analytical samples were collected from contaminated soil left in place and the benzene concentration detected in TK23-HIS-B1 (0.16 mg/kg) exceeded Site Specific Groundwater Residual Contaminant Level (Table A.2.).
- Northern D-door (Figures B.2.c, C.1.a.ii.): Crude oil contaminated soil in this location contained some free-product near the tank and had elevated headspace detections, dark discoloration and a petroleum odor. Within approximately 10 feet of the tank the contaminated soil extended to approximately 8 feet bgs but as you moved away from the tank the contamination depth decreased. Most crude contaminated soil was excavated during the construction excavation and additional remedial excavation work focused on removing the observed free-product. Some contaminated soil was left in place immediately adjacent to the tank due to infrastructure concerns. No analytical sample was collected.

- Northwest mixer (Figures B.2.c, C.1.a.iii.): Crude oil contaminated soil in this location had elevated headspace detections, dark discoloration and a petroleum odor. Most contaminated soil was between 0 and 2 feet bgs and was removed during the construction excavation. Some contaminated soil was left in place immediately adjacent to the tank due to infrastructure concerns. No analytical sample was collected.

2) Tank 23 floor cut-out (Figures B.2.c, C.1.a.iv): The diesel fuel contaminated construction fill was stained immediately below the floor and a petroleum odor and elevated headspace readings (up to 163 ppm) were noted throughout the rest of the exposed one foot of fill material.

iii. Identify the ch. NR 720, Wis. Adm. Code, method used to establish the soil cleanup standards for this site: for example, a Residual Contaminant Level (RCL) , a Site-Specific Residual Contaminant Level (SSRCL), or a Performance Standard as determined under ss NR 720.09, 720.11 and 720.19, Wis. Adm. Code. Identify the land use classification that was used to establish cleanup standards. Provide a copy of the supporting calculations/information in Attachment C.

Soil Residual Contaminant Level Determinations were made using the U.S. EPA Regional Screening Level Web Caclculator (Pub-RR-890) for industrial properties.

C. Groundwater

i. Describe degree and extent of groundwater contamination at or from this site. Relate this to known or suspected sources and known or potential receptors/migration pathways. Specifically address any potential or existing impacts to water supply wells or interception with building foundation drain systems.

No groundwater contamination has been observed. Groundwater was not observed in the road construction excavations or the Geoprobe borings. No hydrocarbons have been detected in the nearest down gradient terminal monitoring well (MW-6; 400 feet to southeast of Tank 23; Figure B.3.d). No migration pathways were identified at the site. No public wells are within 1000 feet of the site. No private wells are within 100 feet of the site.

ii. Describe the presence of free product at the site, including the thickness, depth, and locations.

Some free product was observed in the soil pore space in a localized area beneath the northern D-door. Most of the crude oil contaminated soil was removed during the construction excavation and additional remedial excavation activity in this location that could not be completed due to concerns regarding the structural integrity of the tank. No groundwater with free product was observed in the Tank 23 excavations or borings.

D. Vapor

i. Describe how the vapor migration pathway was assessed, including locations where vapor or indoor air samples were collected. If the vapor pathway was not assessed, explain reasons why.

Not applicable. No vapor receptors are located within 100 feet of the site (Figure B.1.b.).

ii. Identify the applicable DNR action levels and the land use classification used to establish them. Describe where the DNR action levels were reached or exceeded (e.g., sub slab, indoor air or both).

Not applicable. No nearby vapor receptors.

E. Surface Water and Sediment

i. Identify whether surface water and/or sediment was assessed and describe the impacts found. If this pathway was not assessed, explain why.

Not applicable. There are no surface water receptors within the containment basin. The only surface water receptor within 1000 feet is a Terminal drainage ditch approximately 450 feet to the southeast (Figure B.2.b.). Migration to this receptor is unlikely due to site containment berms located between Tank 23 and the drainage ditch and the lack of direct migration pathways.

ii. Identify any surface water and/or sediment action levels used to assess the impacts for this pathway and how these were derived. Describe where the DNR action levels were reached or exceeded.

Not applicable. No surface water is present in the containment basin.

4. Remedial Actions Implemented and Residual Levels at Closure

A. General: Provide a brief summary of the remedial action history. List previous remedial action report submittals by name and date. Identify remedial actions undertaken since the last submittal for this project and provide the appropriate documentation in Attachment C.

1) Tank 23 road construction: Crude oil contaminated soil (headspace > 10 ppm or crude oil staining or odor) excavated during the road construction work was segregated from uncontaminated soil. A total of 540 tons of contaminated soil was hauled to the Shamrock Landfill in Cloquet, MN (Attachment C.2; profile # CL12-0023). The road construction excavation extents were field screened by Barr and additional contaminated soil was removed beyond the planned road grade when doing so did not threaten the tank infrastructure. The approximate pre and post contaminated soil areas are illustrated in Figure B.2.c.

2) Tank 23 floor cut-out: approximately one cubic yard of discolored fill (top 0.2 feet) exposed during the tank floor cut-out was removed for tank maintenance purposes (Figure B.2.b). The soil was hauled to the Shamrock Landfill (Attachment C.2; Profile # CL12-0023). Additional remedial actions were not pursued due to the inaccessibility of the impacted material beneath the tank bottom.

B. Describe any immediate or interim actions taken at the site under ch NR 708, Wis. Adm. Code.
Not Applicable

C. Describe the *active* remedial actions taken at the site, including: type of remedial system(s) used for each media impacted; the size and location of any excavation or in-situ treatment; the effectiveness of the systems to address the contaminated media and substances; operational history of the systems; and summarize the performance of the active remedial actions. Provide any system performance documentation in Attachment A.7.

1) Tank 23 road construction: The ring road construction excavation was approximately 30 feet wide by 2 feet deep (Figure B.2.1). 540 cubic yards of crude oil contaminated soil (headspace > 10 ppm or crude oil staining or odor) was segregated and hauled to the Shamrock Landfill in Cloquet, MN. Most of the crude oil contaminated soil identified during the road excavation was excavated during the construction work however some contaminated soil remains below each tank port next to the foundation as shown in Figures B.2.b. and B.2.c.

2) Tank 23 floor cut-out: No remedial actions, outside the limited excavation of impacted soil, were taken due to the inaccessibility of the contaminated soil beneath the tank floor and the lack of a direct contact risk.

D. Provide a discussion of the nature, degree and extent of residual contamination that will remain at the site or on off-site affected properties after case closure.

1) Tank 23 road construction: Crude oil contaminated soil remains in situ near the Tank 23 foundation and beneath the approximately 2 foot thick gravel roadbed. No free product in soil pore space was observed in the contaminated soil left in place at the base of the road-cut.

2) Tank 23 floor cut-out: Diesel fuel impacted fill material was left in place beneath Tank 23.

E. Describe the remaining soil contamination within four feet of ground surface (direct contact zone) that attains or exceeds the ch. NR720, Wis. Adm. Code, standard(s) for direct contact.

1) Tank 23 road construction: TK23-HIS-B-1 was collected at approximately 2.2 feet bgs. The Benzo(a)pyrene detection (0.525 mg/kg) was the only analyte detection that exceeded the NR720 direct contact standards (Table A.4.).

F. Describe the remaining soil contamination in the vadose zone that attains or exceeds the soil standard(s) for the groundwater pathway.

Groundwater was not encountered during excavation activities or in the soil borings performed as part of this investigation. Therefore, contamination within the vadose zone was not documented.

G. Describe how the residual contamination will be addressed, including but not limited to details concerning: covers, engineering controls or other barrier features; use of natural attenuation of groundwater; and vapor mitigation systems or measures.

1) Tank 23 road construction: the following actions were completed where residual contamination was left in place:
- Remedial excavations below the grade required for the road cut were backfilled with clay fill.
- A geotechnical fabric was placed along the bottom of the road cut.
- Approximately two feet of gravel roadbed material was placed above the geotechnical fabric.
- Tank 23 covers contaminated soil that could not be excavated.

2) Tank 23 floor cut-out: A steel plate was welded to the floor to cover the maintenance work floor cut-out. The tank was subsequently filled with crude oil after the maintenance work was completed. The tank footprint covers the diesel fuel contaminated soil.

H. If using natural attenuation as a groundwater remedy, describe how the data collected supports the conclusion that natural attenuation is effective in reducing contaminant mass and concentration, (e.g. stable or receding groundwater plume).

Not applicable. Groundwater was not encountered during this project.

I. Identify how all exposure pathways were removed and/or adequately addressed by immediate and/or remedial action(s) described above in paragraphs, B, C, D, E and F.

An attempt was made to eliminate the direct contact and groundwater exposure pathways by removing contaminated soil encountered during the ring road construction. Excavation extent field screening tests indicate that residual impacts are only found immediately adjacent to and under the tank structure. The analytical soil samples collected from the western excavation indicate that the only remaining residual impacts documented in that area that were above direct contact and groundwater pathway standards was a benzo(a)pyrene detection in soil sample TK23-HIS-B-1. The excavation extent was driven by the construction objectives and limited by above and below ground tank infrastructure. Borings completed around the perimeter of Tank 23 at the edge of the ring road indicate that the contaminants have not migrated past the perimeter of the road. The documented remaining residual contamination is covered by the tank or has been covered by the new ring road.

J. Identify any system hardware anticipated to be left in place after site closure, and explain the reasons why it will remain.
Not applicable. No system hardware was used.

K. Identify the need for a ch. NR 140, Wis. Adm. Code, groundwater Preventive Action Limit (PAL) or Enforcement Standard (ES) exemption, and identify the affected monitoring points and applicable substances.
Groundwater was not encountered.

L. If a DNR action level for vapor intrusion was exceeded (for indoor air, sub slab, or both) describe where it was exceeded and how the pathway was addressed.
Not applicable. No nearby vapor receptors.

M. Describe the surface water and/or sediment contaminant concentrations and areas after remediation. If a DNR action level was exceeded, describe where it was exceeded and how the pathway was addressed.
Not Applicable. No surface water or sediment were contaminated.

5. Continuing Obligations: Situations where a maintenance plan(s) and inclusion on DNR's GIS Registry are required.

Directions: Check all that apply to this case closure request:

	This scenario Applies to this Case Closure		Case Closure Scenario: Maintenance Plans and GIS Registry	Maintenance Plan (s) Required in Attachment D	GIS Registry Listing
	A. On-Site	B. Off-Site			
i.	☐	☐	Engineering Control/Barrier for Direct Contact	✓	✓
ii.	☐	☐	Engineering Control/Barrier for Groundwater Infiltration	✓	✓
iii.	☐	☐	Vapor Mitigation - post closure passive system	✓	✓
iv.	☐	☐	Vapor Mitigation - post closure active system	✓	✓
v.	☒	☒	None of the above scenarios apply to this case closure	NA	NA

6. Continuing Obligations: Situations where inclusion on DNR's GIS Registry is required.

Directions: Check all that apply to this case closure request:

	This scenario Applies to this Case Closure		Case Closure Scenario: GIS Registry Only	GIS Registry Listing
	A. On-Site	B. Off-Site		
i.	☒	☐	Residual soil contamination exceeds ch. NR 720 generic or site-specific RCLs	✓
ii.	☐	☐	Sites with groundwater contamination equal to or greater than the ch. NR 140, enforcement standards (ES)	✓
iii.	☐	☐	Monitoring wells: lost, transferred or remaining in use	✓
iv.	☒	☐	Structural Impediment (not as a performance standard)	✓
v.	☒	☐	Residual soil contamination remaining at ch. NR 720 Industrial Use levels	✓
vi.	☐	☐	Vapor intrusion may be future, post-closure issue if building use or land use changes	✓
vii.	☐	☒	None of the above scenarios apply to this case closure	NA

7. **Underground Storage Tanks**

A. Were any tanks, piping or other associated tank system components removed as part of the investigation or remedial action? ○ Yes ◉ No

B. Do any upgraded tanks meeting the requirements of ch. SPS 310, Wis. Adm. Code, exist on the property? ○ Yes ◉ No

C. If the answer to question 7b is yes, is the leak detection system currently being monitored? ○ Yes ○ No

Data Tables (Attachment A)

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form.All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

General directions for Data Tables:

- Use bold and italics font on information of importance on tables and figures. Use **bold font** for ch. NR 140, Wis. Adm. Code, groundwater enforcement standard (ES) attainments or exceedances, and *italicized font* for ch. NR 140, Wis. Adm. Code, groundwater preventive action limit (PAL) standard attainments or exceedances.
- Do not use shading or highlighting on the analytical tables.
- Include on Data Tables the level of detection for results which are below the detection level (i.e. do not just list as no detect (ND)).
- Include the units on data tables.
- Summaries of all data must include information collected by previous consultants.
- Do not submit lab data sheets unless these have not been submitted in a previous report. Tabulate all data required in s. NR 716.15 (2)(g)3, Wis. Adm. Code, in the format required in s. NR 716.15(2)(h)3, Wis. Adm. Code.
- Include in Attachment A all of the following tables, in the order prescribed below, with the specific Closure Form titles noted on the separate attachments (e.g., Title: A.1. Groundwater Analytical Table; A.2. Pre-remedial Soil Analytical Table, etc).
- For required documents, each table (e.g., A.1., A.2., etc.,) should be a separate PDF.

A. Data Tables

A.1. **Groundwater Analytical Table(s):** Table(s) showing the analytical results and collection dates, for all groundwater sampling points e.g. monitoring wells, temporary wells, sumps, extraction wells, any potable wells and any other wells, extraction wells and any potable wells for which samples have been collected.

A.2. **Pre-remedial Soil Analytical Table(s): T**able(s) showing the soil analytical results and collection dates - prior to conducting the interim and/or remedial action. Indicate if sample was collected above or below the all-time low water table (unsaturated verses saturated).

A.3. **Post-remedial Soil Analytical Table(s):** Table(s) showing the post-remedial action soil analytical results and collection dates. Indicate if sample was collected above or below the all-time low water table (unsaturated verses saturated).

A.4. **Pre and Post Remaining Soil Contamination Soil Analytical Table(s):** Table(s) showing only the pre and post remedial action soil analytical results that exceed a Residual Contaminate Level (RCL) or a Site-Specific Residual Level (SSRCL).

A.5. **Vapor Analytical Table**: Table(s) showing type(s) of samples, sample collection methods, analytical method, sample results, date of sample collection, time period for sample collection, method and results of leak detection, and date, method and results of communication testing.

A.6. **Other Media of Concern (e.g., sediment or surface water)**: Table(s) showing type(s) of sample, sample collection method, analytical method, sample results, date of sample collection, time period for sample collection, method and results sampling.

A.7. **Water Level Elevations:** Table(s) showing all water level elevation measurements and dates from all monitoring wells. If present, free product should be noted on the table.

A.8. **Other:** This attachment should include: 1) any available tabulated natural attenuation data; 2) data tables pertaining to engineered remedial systems that document operational history, demonstrate system performance and effectiveness, and display emissions data; and (3) any other data tables relevant to case closure not otherwise noted above. If this section is not applicable, please explain the reasons why.

Maps and Figures (Attachment B)

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form. All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

General Directions for all Maps and Figures:

- If any map or figure is not relevant to the case closure request, you must fully explain the reason(s) why and attach that explanation (properly labeled with the map/ figure title) in Attachment B.
- Provide on paper no larger than 11 x 17 inches, unless otherwise directed by the Department. Maps and figures may be submitted in a larger electronic size than 11x17 inches, in a portable document format (pdf) readable by the Adobe Acrobat Reader. However, those larger-size documents must be legible when printed.

- Prepare visual aids, including maps, plans, drawings, fence diagrams, tables and photographs according to the applicable portions of ss. NR 716.15(2)(h)1 and 726.05(3)(a)4.d, Wis Adm. Code.
- Do not use shading or highlights on any of the analytical tables.
- Include all sample locations.
- Contour lines should be clearly labeled and defined.
- Include in Attachment B all of the following maps and figures, in the order prescribed below, with the specific Closure Form titles noted on the separate attachments (e.g., Title: B.1. Location Map; B.2. Detailed Site Map, etc).
- For the electronic copies that are required, each map (e.g., B.1.a., B.2.a, etc.,) should be a separate PDF.

B.1. Location Maps

B.1.a. **Location Map:** A map outlining all properties within the contaminated site boundaries on a U.S.G.S. topographic map or plat map in sufficient detail to permit easy location of all impacted and/or adjacent parcels. If groundwater standards are exceeded, include the location of all potable wells, including municipal wells, within 1200 feet of the area of contamination.

B.1.b. **Detailed Site Map:** A map that shows all relevant features (buildings, roads, current ground surface cover, individual property boundaries for on-site and applicable off-site properties, contaminant sources, utility lines, monitoring wells and potable wells) within the contaminated area. This map is to show the location of all contaminated public streets, and highway and railroad rights-of-way in relation to the source property and in relation to the boundaries of groundwater contamination exceeding a ch. NR 140 Enforcement Standard (ES), and/or in relation to the boundaries of soil contamination exceeding a Residual Contaminant Level (RCL) or a Site Specific Residual Contaminant Levels (SSRCL) as determined under ss. NR 720.09, 720.11 and 720.19, Wis. Adm. Code.

B.1.c. **RR Site Map:** From RR Sites Map (http://dnrmaps.wi.gov/imf/imf.jsp?site=brrts2) attach a map depicting the source property, and all open and closed BRRTS sites within a half-mile radius or less of the property.

B.2. Soil Figures

B.2.a. **Pre-remedial Soil Contamination:** Figure(s) showing the sample location of all pre-remedial, unsaturated contaminated soil and a single contour showing the horizontal extent of each area of contiguous residual soil contamination that exceeded a Residual Contaminant Level (RCL) or a Site-Specific Residual Contaminant Level (SSRCL) as determined under ss. NR 720.09, 720.11 and 720.19, Wis. Adm. Code.

B.2.b. **Post-remedial Soil Contamination :** Figure(s) showing the sample location of all post-remedial, unsaturated contaminated soil and a single contour showing the horizontal extent of each area of contiguous residual soil contamination that exceeds a Residual Contaminant Level (RCL) or a Site-Specific Residual Contaminant Level (SSRCL) as determined under ss. NR 720.09, 720.11 and 720.19, Wis. Adm. Code. A separate contour line should be used to indicate the extent of residual direct contact exceedances.

B.2.c. **Pre/Post Remaining Soil Contamination:** Figure(s) showing the only location of all pre and post remedial residual soil sample location(s) where unsaturated contaminated soil remains after remediation and a single contour showing the horizontal extent of each area of contiguous residual soil contamination that exceeds a Residual Contaminate Level (RCL) or a Site-Specific Residual Level (SSRCL) as determined under ss. NR 720.09, 720.11 and 720.19, Wis. Admin. Code. A separate contour line should be used to indicate the extent of residual direct contact exceedances.

B.3. Groundwater Figures

B.3.a. **Geologic Cross-Section Figure(s):** One or more cross-section diagrams showing soil types and correlations across the site, water table and piezometric elevations, and locations and elevations of geologic rock units, if encountered. Display on one or more figures all of the following:

- Source location(s) and vertical extent of residual soil contamination exceeding a Residual Contaminant Level (RCL) or a Site Specific Residual Contaminant Level (SSRCL).
- Source location(s) and lateral and vertical extent if groundwater contamination exceeds a ch. NR 140 Enforcement Standard (ES)
- Surface features, including buildings and basements, and show surface elevation changes.
- Any areas of active remediation within the cross section path, such as excavations or treatment zones.
- Include a map displaying the cross-section location(s), if they are not displayed on the Detailed Site Map (Map B.1b)

B.3.b. **Groundwater Isoconcentration:** Figure(s) showing the horizontal extent of the post-remedial groundwater contamination exceeding a ch. NR 140, Wis. Adm. Code, Preventive Action Limit (PAL) and/or an Enforcement Standard (ES). Indicate the date and direction of groundwater flow based on the most recent sampling data.

B.3.c. **Groundwater Flow Direction:** Figure(s) representing groundwater movement at the site. If the flow direction varies by more than 20° over the history of the site, submit two groundwater flow maps showing the maximum variation in flow direction.

B.3.d. **Monitoring Wells:** Figure(s) showing all monitoring wells, with well identification number. Clearly designate any wells that: (1) are proposed to be abandoned; (2) cannot be located; (3) are being transferred; (4) will be retained for further sampling, or (5) have been previously abandoned.

B.4. Vapor Maps and Other Media

B.4.a. **Vapor Intrusion Map:** Map(s) showing all locations and results for samples taken to investigate the vapor intrusion pathway, in relation to remaining soil and groundwater contamination, including sub-slab, indoor air, soil vapor, ambient air, and communication testing. Show locations and footprints of affected structures and utility corridors, and/or where residual contamination poses a future risk of vapor intrusion.

B.4.b. **Other media of concern (e.g., sediment or surface water**): Map(s) showing all sampling locations and results for other media investigation. Include the date of sample collection and identify where any standards are exceeded.

B.4.c. **Other:** Include any other relevant maps and figures not otherwise noted above. (This section may remain blank)

Documentation of Remedial Action (Attachment C)

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form. All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

General Directions:

- Include in Attachment C all of the following documentation, in the order prescribed below, with the specific Closure Form titles noted on the separate attachments (e.g., Title: C.1. Site Investigation Documentation; C.2. Investigative Waste, etc).
- If the documentation requested below is "not applicable" to the site-specific circumstances, include a brief explanation to support that conclusion.
- If the documentation requested below has already been submitted to the Department, please note the title and date of the report for that particular document requested.

C.1. **Site investigation documentation,** that has not otherwise been previously submitted.

C.2. **Investigative waste** disposal documentation.

C.3. **NR 720.19 analysis**, assumptions and calculations for site specific RCLs (SSRCLs) , with justification, including EPA Soil Screening Level Model Calculations and results.

C.4. **Construction documentation** or as-built report for any constructed remedial action or portion of, or interim action specified in s. NR 724.02(1), Wis. Adm. Code.

C.5. **Decommissioning of Remedial Systems. I**nclude plans to properly abandon any systems or equipment upon receiving conditional closure.

C.6. **Photos. F**or sites or facilities with a cover or other performance standard, a structural impediment or a vapor mitigation system. Include one or more photographs documenting the condition and extent of the feature at the time of the closure request. Pertinent features should be visible and discernible. Photographs must be labeled with the site name, the features shown, location and the date on which the photograph was taken.

C.7. **Other**. Include any other relevant documentation not otherwise noted above. (This section may remain blank)

Maintenance Plan(s) (Attachment D)

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form. All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

When one or more "maintenance plans" are required for a site closure, include in each maintenance plan all required information in sections D.1. through D.5. below, and attach the plan(s) in Attachment D. The following "model" maintenance plans can be located at: (1) Maintenance plan for a engineering control or cover: http://dnr.wi.gov/topic/Brownfields/documents/maintenance-plan.pdf; and (2) Maintenance plan for vapor intrusion: http://dnr.wi.gov/topic/Brownfields/documents/appendix5_606.pdf.

D.1. **Location map(s)** which show(s): (1) the feature that requires maintenance; (2) the location of the feature(s) that require(s) maintenance - on and off the source property; (3) the extent of the structure or feature(s) to be maintained, in relation to other structures or features on the site; (4) the extent and type of residual contamination; and (5) and all property boundaries.

D.2. **Brief descriptions** of the type, depth and location of residual contamination.

D.3. **Description of maintenance action(s)** required for maximizing effectiveness of the engineered control, vapor mitigation system, feature or other action for which maintenance is required.

D.4. **Inspection log**, to be maintained on site, or at a location specified in the maintenance plan or approval letter.

D.5. **Contact information,** including the name, address and phone number of the individual or facility who will be conducting the maintenance.

Monitoring Well Information (Attachment E)

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form. All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

General Directions:

Attach monitoring well construction and development forms (DNR FORM 4400-113 A and B: http://dnr.wi.gov/topic/groundwater/documents/forms/4400_113_1_2.pdf) for all wells that will remain in-use, be transferred to another party or that could not be located. A figure of these wells should be included in Attachment B.3.d.

Select One:

- ◉ No monitoring wells were required as part of this response action.
- ○ All monitoring wells have been located and will be properly abandoned upon the DNR granting conditional closure to the site
- ○ ***Select One or More:***
  - ☐ Not all monitoring wells can be located, despite good faith efforts. Attachment E must include description of efforts made to locate the "lost" wells.
  - ☐ One or more wells will be transferred to another owner upon case closure being granted. Attachment E should include documentation identifying the name, address and email for the new owner(s).
  - ☐ One or more wells will remain in use at the site after this closure. Attachment E must include documentation as to the reason(s) the well(s) will remain in use.

Notifications to Owners of Impacted Properties (Attachment F)

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form. All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

General Directions:

- State law requires that the responsible party provide a 30-day, written advance notice (i.e., a letter) to certain persons prior to applying for case closure. This requirement applies if: (1) the person conducting the response action does not own the source property; (2) the contamination has migrated onto another property; and/or (3) one or more monitoring wells will not be abandoned.
- A model "template letter" for these mandatory notifications can be downloaded at: http://dnr.wi.gov/files/PDF/pubs/rr/RR919.pdf.

Check all that apply to the site-specific circumstances of this case closure:

	A. Impacted Source Property and Owner is not Conducting Cleanup	B. Impacted Right of Way	C. Impacted Off-Site Property Owner	Impacted Property Notification Situations: Ch. NR 726 Appendix A Letter
1.	☐	☐	☐	Residual groundwater contamination exceeds Ch. NR 140 Wis. Administrative Code enforcement standards.
2.	☒	☐	☐	Residual soil contamination that attains or exceeds standards is present after the remedial action is complete, and must be properly managed should it be excavated or removed.
3.	☐	☐	☐	An engineered cover or a soil barrier (e.g. pavement) must be maintained over contaminated soil for direct contact or groundwater infiltration concerns.
4.	☒	☐	☐	Industrial land use soil standards were used for the clean-up standard.
5.	☐	☐	☐	A vapor mitigation system (or other specific vapor protection) must be operated and maintained.
6.	☐	☐	☐	Vapor assessment needed if use changes.
7.	☒	☐	☐	Structural impediment.
8.	☐	☐	☐	Lost, transferred or open monitoring wells.
9.	☐	☒	☒	Not Applicable.

If any of the previous boxes in rows 1 thru 8 were checked, include the following as part of Attachment F:

- FORM 4400-246;
- Copy of each letter sent, 30 days or more prior to requesting closure; and
- Proof of receipt for each letter.
- For this site closure, _____ (number) property (ies) has/have been impacted, the owners have been notified, and copies of the letters and receipts are included in Attachment F.

Source Legal Documents (Attachment G)

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form.All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

Include all of the following documents, in this order, in Attachment G:

G.1. **Deeds - Source Property and Other Impacted Properties:** The most recent deed with legal descriptions clearly labeled for (1) the **Source Property** (where the contamination originated) and (2) all **off-source** (off-site) properties where letters were required to be sent per the ch. NR 700, Wis. Adm. Code, rule series (e.g., off-site cover maintenance required, lost monitoring well, off-site cover property impacts to groundwater exceeding the ch. NR 140, Wis. Adm. Code.

Note: *If a property has been purchased with a land contract and the purchaser has not yet received a deed, a copy of the land contract which includes the legal description shall be submitted instead of the most recent deed. If the property has been inherited, written documentation of the property transfer should be submitted along with the most recent deed.*

G.2. ***Certified Survey Map:*** *A copy of the certified survey map or the relevant section of the recorded plat map for those properties where the legal description in the most recent deed refers to a certified survey map or a recorded plat map.* (Lots on subdivided or platted property (e.g. lot 2 of xyz subdivision)).

G.3. **Verification of Zoning**: Documentation (e.g., official zoning map or letter from municipality) of the property's or properties' current zoning status.

G.4. **Signed Statement:** A statement signed by the Responsible Party (RP), which states that he or she believes that the attached legal description(s) accurately describe(s) the correct contaminated property or properties.

Signatures and Findings for Closure Determination

If any section is not relevant to the case closure request, you must fully explain the reasons why and attach that explanation to the relevant section of the form. All information submitted shall be legible. Providing illegible information may result in a submittal being considered incomplete until corrected.

Check the correct signature block below for this case closure request, and have the proper environmental professional(s) sign this document, in accordance with the ch. NR 700 Wis. Adm. Code rule series. Both boxes may be checked if applicable to this case closure.

☐ A response action(s) for this site addresses groundwater contamination (including natural attenuation remedies). In this situation, the closure request must be prepared by, or under the supervision of, a professional engineer and a hydrogeologist, as defined in ch. NR 712, Wis. Adm. Code. Include both signatures provided below with the submittal.

☐ The response action(s) for this site addresses media other than groundwater. In this situation, the case closure request must be prepared by, or under the supervision of, a professional engineer, as defined in ch. NR 712, Wis. Adm. Code. The "engineering certification" language below, at a minimum, must be signed.

Engineering Certification

I _____ hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this case closure request has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this case closure request is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code. All phases of work necessary to obtain data, develop conclusions, recommendations and prepare submittals for this case closure request have been prepared by me, or their preparation has been supervised by me. Specifically, with respect to compliance with the rules, in my professional opinion a site investigation has been conducted in accordance with ch. NR 716, Wis. Adm. Code, and all necessary remedial actions have been completed in accordance with chs. NR 140, NR 718, NR 720, NR 722, NR 724 and NR 726, Wis. Adm. Codes."

Printed Name	Title

Signature	Date	P.E. Stamp and Number

Hydrogeologist Certification

I Lynette Carney hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this case closure request is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code. All phases of work necessary to address groundwater contamination including obtaining data, developing conclusions, recommendations and preparing submittals for this case closure request have been prepared by me, or their preparation has been supervised by me. Specifically, with respect to compliance with the rules, in my professional opinion a site investigation has been conducted in accordance with ch. NR 716, Wis. Adm. Code, and all necessary remedial actions have been completed in accordance with chs. NR 140, NR 718, NR 720, NR 722, NR 724 and NR 726, Wis. Adm. Codes."

Lynette Carney	Professional Geologist (WI Reg. No. 1138)
Printed Name	Title
Lynette Carney	9/25/13
Signature	Date

Attachment A.*1.*

Groundwater Analytical Table

Not applicable - Groundwater was not encountered during this project

Table A.2
Soil Analytical Data Summary
Tank 23 Pre-remedial Soil Analytical Tables
Enbridge Terminal - Superior, Wisconsin
Units, mg/kg (unless otherwise noted)
All samples were collected above the all-time low water table.

		Chemical Name	Moisture	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene
	Effective Date	Exceedance Key															
Site Specific Groundwater RCLs		**Bold**				196.7442		**0.47**	**0.48**			**0.0725**		44.4089	7.4074		0.3294
Site Specific Industrial Direct Contact RCLs	05/01/2012	*Italic*		33000	487	100000	2.11	*0.211*	2.11		21.1	211	0.211	22000	22000	2.11	26
Location	**Sample Date**	**Depth (ft)**															
TK23-Floor Repair-1	1/31/2013		3.8 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-HIS-B1	4/3/2012	2.2	25.3 %	0.0576	< 0.0134	0.0987	0.302	***0.525***	**0.662**	0.148	0.267	**0.327**	0.0566	0.439	0.0800	0.158	0.0290
TK23-HIS-S1	4/3/2012	0.5	8.2 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-01	3/26/2013	6 - 7	24.1 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-02	3/26/2013	6 - 7	28.2 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-03	3/26/2013	5 - 6	25.1 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-03	3/26/2013	9 - 10	22.8 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-04	3/26/2013	6 - 7	25.1 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-05	3/26/2013	6 - 7	26.2 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-06	3/26/2013	5 - 6	23.6 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-07	3/26/2013	6 - 7	28.6 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-08	3/26/2013	5 - 6	24.4 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-09	3/26/2013	5 - 6	25.1 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TR - Based on 1,2,4-Trimethylbenzene and 1,3,5-Trimethylbenzene combined.

XYL - Based on Xylenes (m-, o-, p- combined).

*Estimated value, QA/QC criteria not met.

-- Not analyzed/Not available.

Table A.2
Soil Analytical Data Summary
Tank 23 Pre-remedial Soil Analytical Tables
Enbridge Terminal - Superior, Wisconsin
Units, mg/kg (unless otherwise noted)
All samples were collected above the all-time low water table.

		Chemical Name	Phenanthrene	Pyrene	Methyl tertiary butyl ether (MTBE)	1,2,4-Trimethyl benzene	1,3,5-Trimethyl benzene	Benzene	Diesel Range Organics	Ethyl benzene	Gasoline Range Organics	Toluene	Xylene, total	Exceedance Count	Hazard Quotient	Cumulative Cancer Risk	Pass or Fail
	Effective Date	Exceedance Key															
Site Specific Groundwater RCLs		**Bold**		27.2362	0.0135	**1.3793 TR**	**1.3793 TR**	**0.0051**		0.785		0.5536	**1.97 XYL**				
Site Specific Industrial Direct Contact RCLs	05/01/2012	*Italic*	115	16500	293	219	182	7.41		37		818	258	*0*	1.0	0.00001	*Pass*
Location	**Sample Date**	**Depth (ft)**															
TK23-Floor Repair-1	1/31/2013		--	--	< 0.0536	**9.94**	**7.81**	< 0.0214	7130	0.141	--	< 0.0536	**2.17**	0	0.0277	6.9E-09	Pass
TK23-HIS-B1	4/3/2012	2.2	0.324	0.463	--	0.66 *	0.30 *	**0.16 ***	187	0.24 *	--	< 0.13 *	0.69 *	*1*	0.0023	3.3E-06	*Fail*
TK23-HIS-S1	4/3/2012	0.5	--	--	--	< 0.052	< 0.052	< 0.052	219	< 0.052	--	< 0.052	< 0.16	0	0.0003	8.4E-09	Pass
TK23-SB-01	3/26/2013	6 - 7	--	--	--	< 0.064	< 0.064	< 0.064	< 11.8	< 0.064	< 6.4	< 0.064	< 0.19	0	0.0003	1.0E-08	Pass
TK23-SB-02	3/26/2013	6 - 7	--	--	--	< 0.070	< 0.070	< 0.070	< 12.7	< 0.070	< 7.0	< 0.070	< 0.21	0	0.0004	1.1E-08	Pass
TK23-SB-03	3/26/2013	5 - 6	--	--	--	< 0.066	< 0.066	< 0.066	< 13.0	< 0.066	< 6.6	< 0.066	0.22	0	0.0003	1.1E-08	Pass
TK23-SB-03	3/26/2013	9 - 10	--	--	--	0.12	< 0.063	< 0.063	< 11.6	< 0.063	< 6.3	< 0.063	< 0.19	0	0.0005	1.0E-08	Pass
TK23-SB-04	3/26/2013	6 - 7	--	--	--	< 0.067	< 0.067	< 0.067	< 13.1	< 0.067	< 6.7	< 0.067	< 0.20	0	0.0003	1.1E-08	Pass
TK23-SB-05	3/26/2013	6 - 7	--	--	--	< 0.067	< 0.067	< 0.067	< 12.0	< 0.067	< 6.7	< 0.067	< 0.20	0	0.0003	1.1E-08	Pass
TK23-SB-06	3/26/2013	5 - 6	--	--	--	< 0.067	< 0.067	< 0.067	< 12.1	< 0.067	< 6.7	< 0.067	< 0.20	0	0.0003	1.1E-08	Pass
TK23-SB-07	3/26/2013	6 - 7	--	--	--	< 0.070	< 0.070	< 0.070	< 14.1	< 0.070	< 7.0	< 0.070	< 0.21	0	0.0004	1.1E-08	Pass
TK23-SB-08	3/26/2013	5 - 6	--	--	--	< 0.065	< 0.065	< 0.065	< 12.6	< 0.065	< 6.5	< 0.065	< 0.20	0	0.0003	1.1E-08	Pass
TK23-SB-09	3/26/2013	5 - 6	--	--	--	< 0.067	< 0.067	< 0.067	< 13.2	< 0.067	< 6.7	< 0.067	< 0.20	0	0.0003	1.1E-08	Pass

TR - Based on 1,2,4-Trimethylbenzene and 1,3,5-Trimethylbenzene combined.

XYL - Based on Xylenes (m-, o-, p- combined).

*Estimated value, QA/QC criteria not met.

-- Not analyzed/Not available.

Attachment A.*3.*

Post Remedial Soil Analytical Table

Not applicable - Soil remediation was not completed following construction and investigation activities

Table A.4
Soil Analytical Data Summary
RCL Exceedances Only
Tank 23 Historical Contamination
Enbridge Terminal - Superior, Wisconsin
Units, mg/kg (unless otherwise noted)
All samples were collected above the all-time low water table.

		Chemical Name	Moisture	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene
	Effective Date	Exceedance Key														
Site Specific Groundwater RCLs		**Bold**				196.7442		**0.47**	**0.48**			**0.0725**		44.4089	7.4074	
Site Specific Industrial Direct Contact RCLs	05/01/2012	*Italic*		33000	487	100000	2.11	*0.211*	2.11		21.1	211	0.211	22000	22000	2.11
Location	**Sample Date**	**Depth (ft)**														
TK23-Floor Repair-1	1/31/2013		3.8 %	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-HIS-B1	4/3/2012	2.2	25.3 %	0.0576	< 0.0134	0.0987	0.302	***0.525***	**0.662**	0.148	0.267	**0.327**	0.0566	0.439	0.0800	0.158

TR - Based on 1,2,4-Trimethylbenzene and 1,3,5-Trimethylbenzene combined.

XYL - Based on Xylenes (m-, o-, p- combined).

*Estimated value, QA/QC criteria not met.

-- Not analyzed/Not available.

Table A.4
Soil Analytical Data Summary
RCL Exceedances Only
Tank 23 Historical Contamination
Enbridge Terminal - Superior, Wisconsin
Units, mg/kg (unless otherwise noted)
All samples were collected above the all-time low water table.

		Chemical Name	Naphthalene	Phenanthrene	Pyrene	Methyl tertiary butyl ether (MTBE)	1,2,4-Trimethyl benzene	1,3,5-Trimethyl benzene	Benzene	Diesel Range Organics	Ethyl benzene	Toluene	Xylene, total	Exceedance Count	Hazard Quotient	Cumulative Cancer Risk	Pass or Fail
	Effective Date	Exceedance Key															
Site Specific Groundwater RCLs		**Bold**	0.3294		27.2362	0.0135	**1.3793 TR**	**1.3793 TR**	**0.0051**		0.785	0.5536	**1.97 XYL**				
Site Specific Industrial Direct Contact RCLs	05/01/2012	*Italic*	26	115	16500	293	219	182	7.41		37	818	258	0	1.0	0.00001	Pass
Location	**Sample Date**	**Depth (ft)**															
TK23-Floor Repair-1	1/31/2013		--	--	--	< 0.0536	**9.94**	**7.81**	< 0.0214	7130	0.141	< 0.0536	**2.17**	0	0.0277	6.9E-09	Pass
TK23-HIS-B1	4/3/2012	2.2	0.0290	0.324	0.463	--	0.66 *	0.30 *	**0.16** *	187	0.24 *	< 0.13 *	0.69 *	*1*	0.0023	0.0000033	*Fail*

TR - Based on 1,2,4-Trimethylbenzene and 1,3,5-Trimethylbenzene combined.

XYL - Based on Xylenes (m-, o-, p- combined).

*Estimated value, QA/QC criteria not met.

-- Not analyzed/Not available.

Attachment A.*5.*

Vapor Analytical Table

Not applicable - Vapor receptors were not present within 100 feet of the site.

Attachment A.*6.*

Other Media of Concern

Not applicable - No other media of concern were present

Attachment A.7.

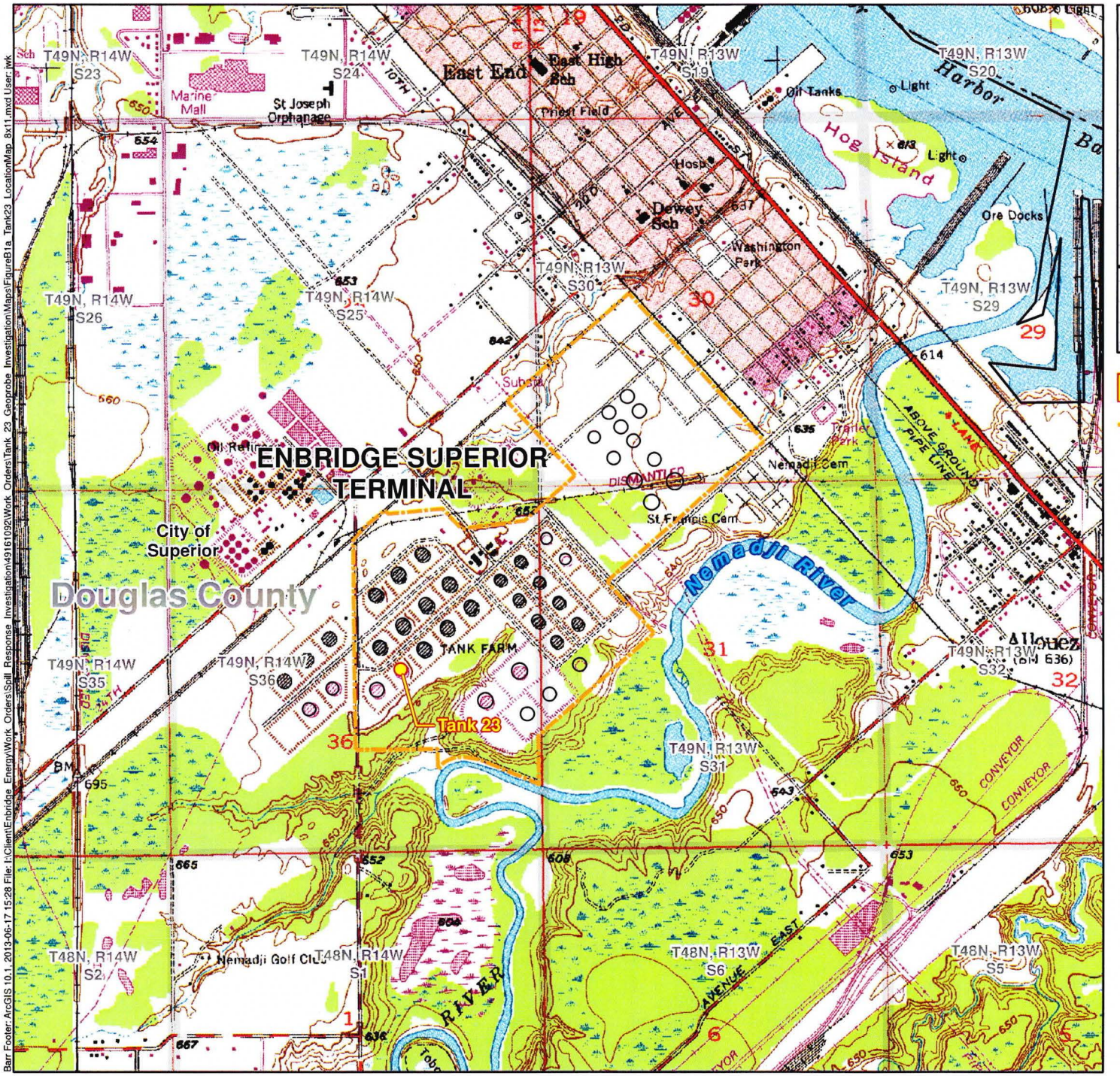
Water Level Elevations

Not applicable - Groundwater was not encountered during this project

Attachment A.*8.*

Other

Not applicable - Natural attenuation data was not determined and no remedial system was utilized



Tank 23

Terminal Property Boundary

N

0 2,000 4,000

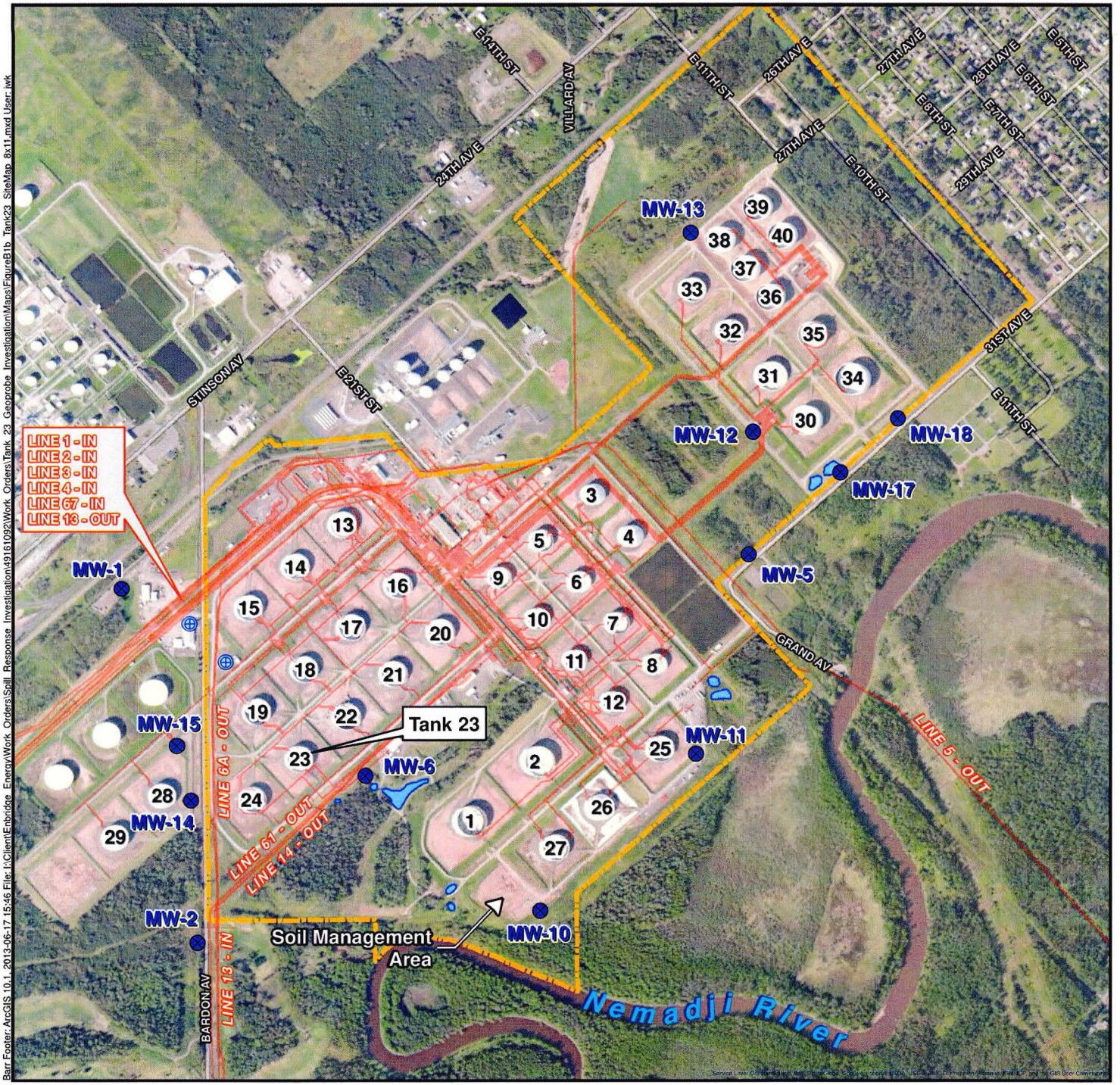
Feet

1 Inch = 2,000 Feet

Figure B.1.a.

LOCATION MAP
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE



- Terminal Monitoring Wells
- Potable Wells
- Retention Ponds
- Pipeline Infrastructure
- Terminal Property Boundary

Note:
Cross Section is identified on Figure B.2.a.

0 1,000 2,000

Feet

1 Inch = 1,000 Feet

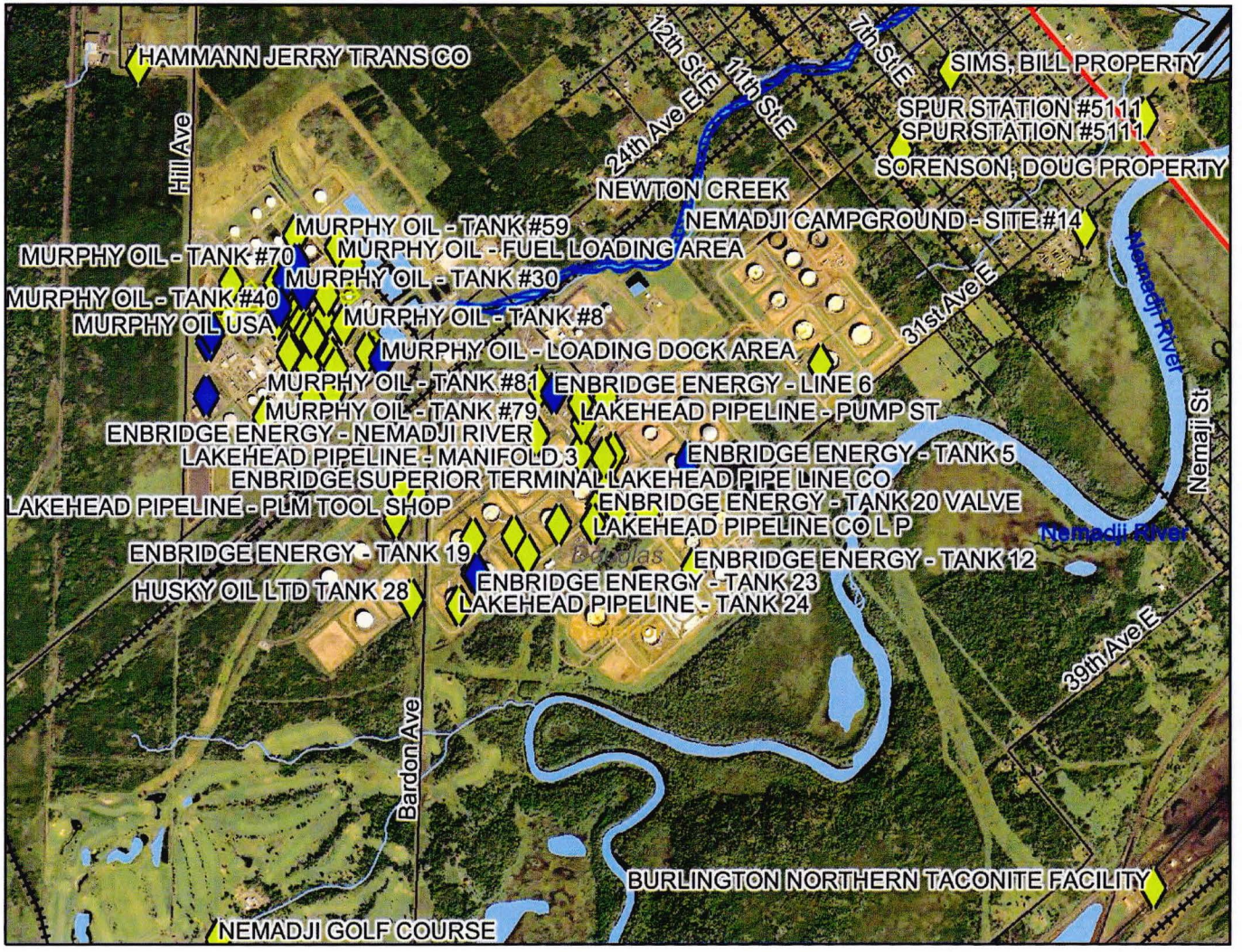
ESRI World Imagery Circa August, 2011

Figure B.1.b.

DETAILED SITE MAP
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Map Created on Apr 17, 2013



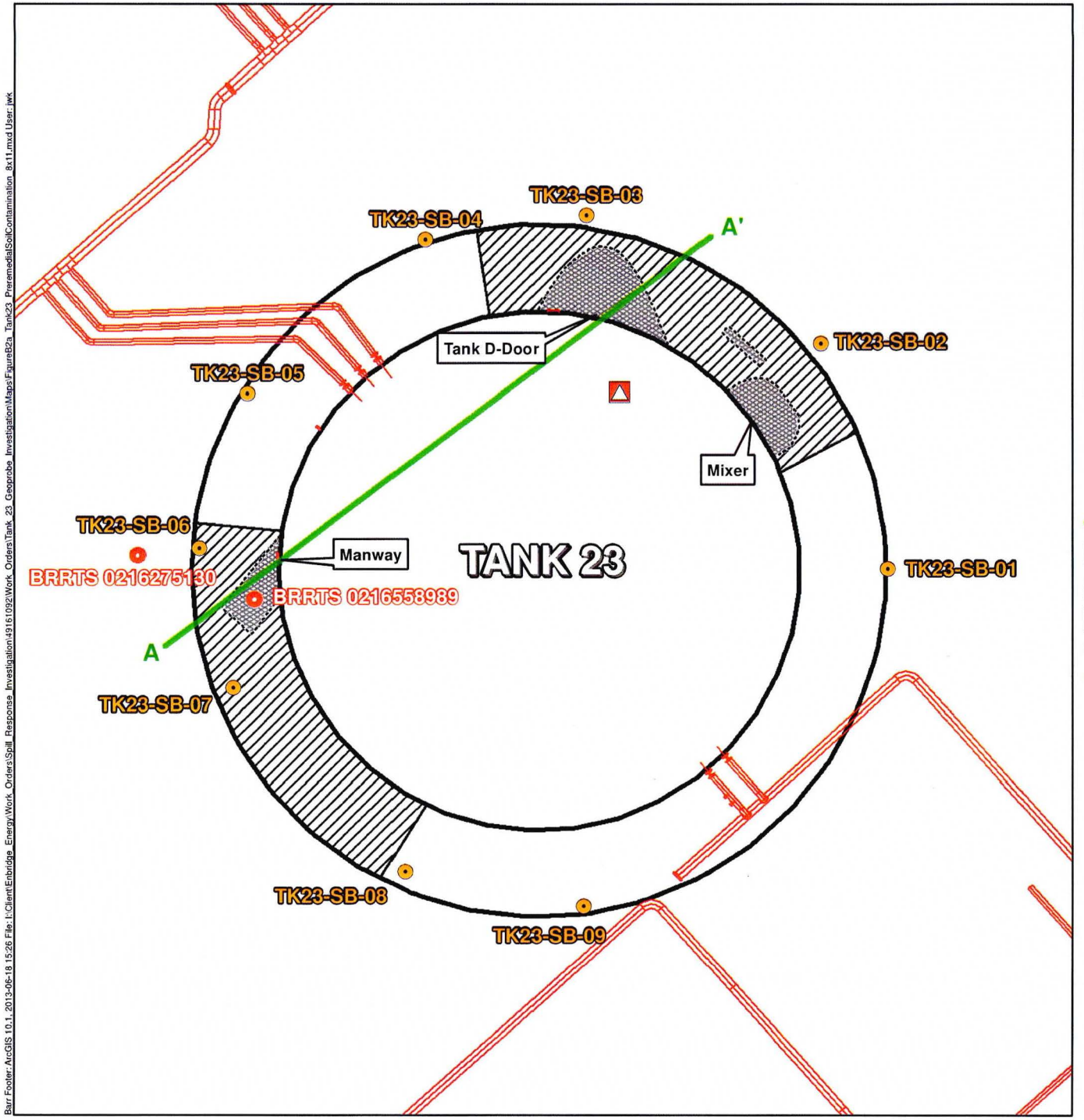
Legend

- Open Sites (ongoing cleanups)
- Open Sites (ongoing cleanups) - site boundaries shown
- Closed Sites (completed cleanups)
- Closed Sites (completed cleanups) - site boundaries shown
- County Boundary
- Railroads
- County Roads (WDOT)
- County Trunk Highway
- State and U.S. Highways (WDOT)
- State Trunk Highway
- US Highway
- Interstate Highways (WDOT)
- Interstate Highway
- Local Roads (WDOT)
- Civil Towns
- Civil Town
- 24K Open Water
- 24K Rivers and Shorelines
- Municipalities

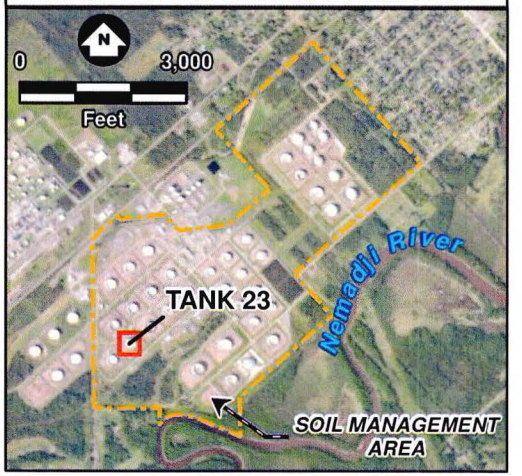
0 2100 4200 6300 ft.

Map created on Apr 17, 2013
Note: Not all RR Sites have been geo-located yet.

Scale: 1:21,821



ENBRIDGE SUPERIOR TERMINAL



- Geoprobe Borings
- Approximate Tank Bottom Cut Out Location
- Documented Historical Releases
- Cross Section A - A'
- Field Screened Area
- Existing or Potential Residual Direct Contact Exceedance - Pre-Remedial Excavation
- Road Boundary
- Pipeline Infrastructure
- Terminal Property Boundary

N

0 50 100

Feet

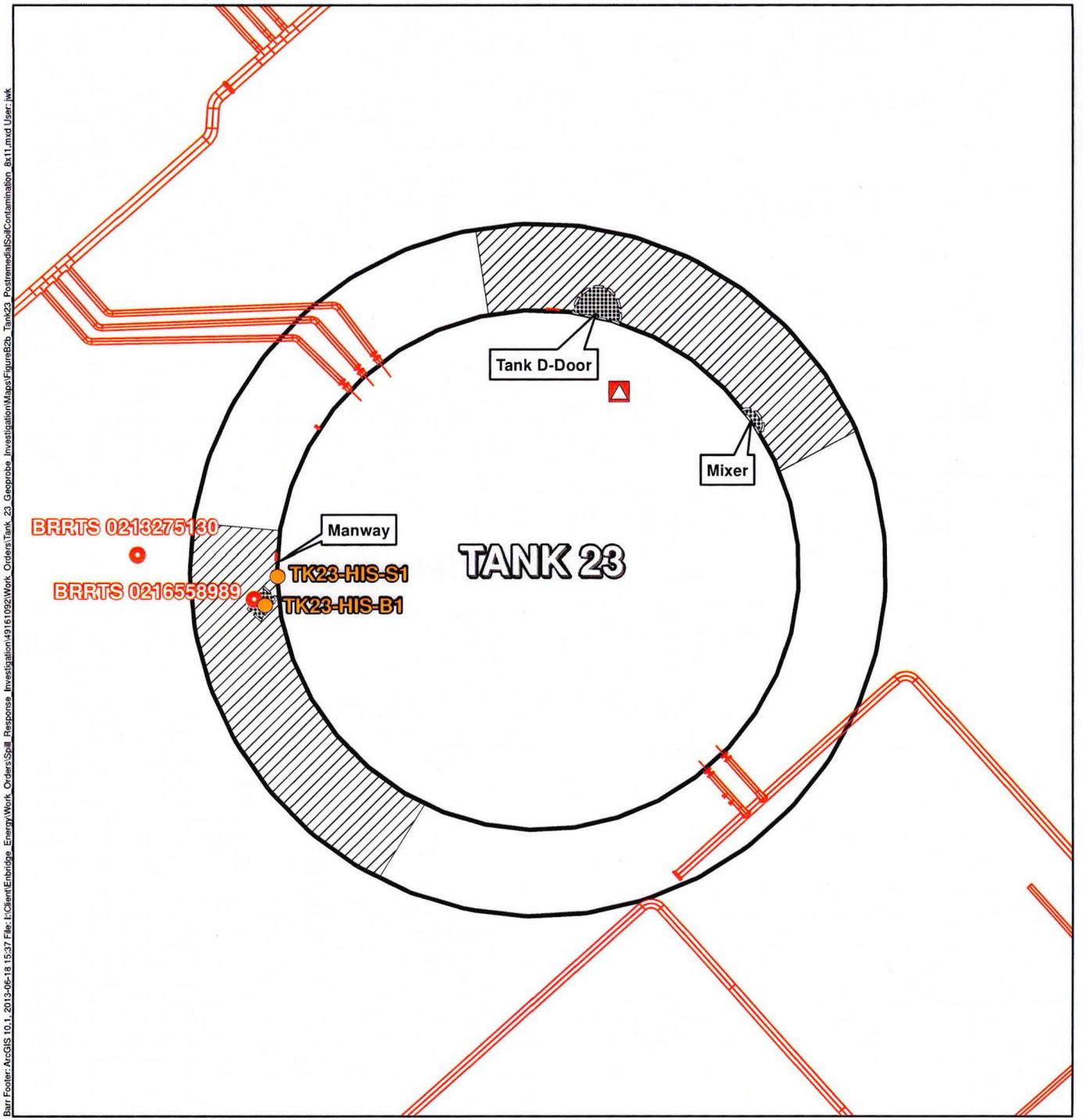
1 Inch = 50 Feet

Figure B.2.a.

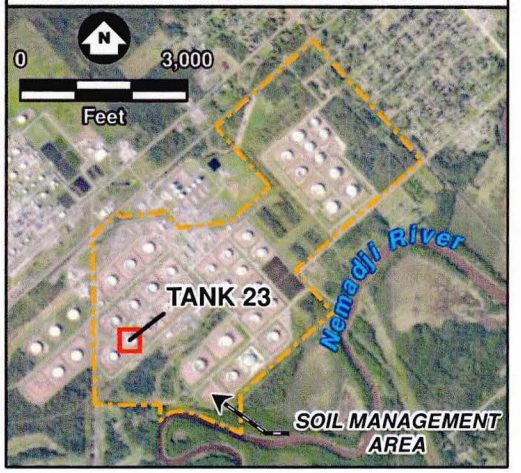
TANK 23 PRE-REMEDIAL SOIL CONTAMINATION SUPERIOR TERMINAL

Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE



ENBRIDGE SUPERIOR TERMINAL



- Analytical Samples
- Approximate Tank Bottom Cut Out Location
- Documented Historical Releases
- Field Screened Area
- Impacted Soil - Post-Remedial Excavation
- Road Boundary
- Pipeline Infrastructure
- Terminal Property Boundary

N

0 50 100

Feet

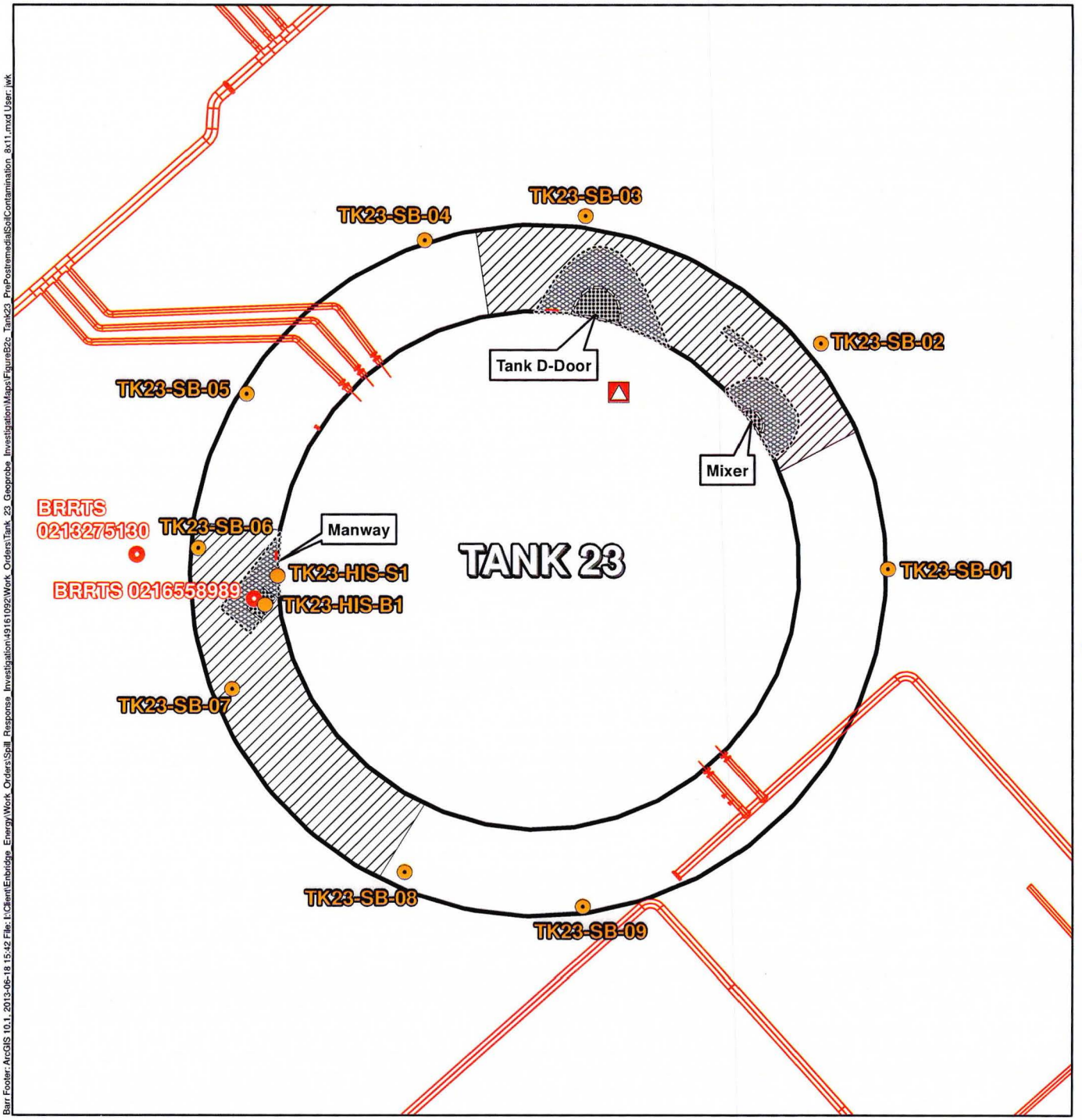
1 Inch = 50 Feet

Figure B.2.b.

TANK 23 POST-REMEDIAL SOIL CONTAMINATION SUPERIOR TERMINAL

Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE



ENBRIDGE SUPERIOR TERMINAL

- Geoprobe Borings
- Analytical Samples
- Approximate Tank Bottom Cut Out Location
- Documented Historical Releases
- Field Screened Area
- Impacted Soil - Post-Remedial Excavation
- Impacted Soil - Pre-Remedial Excavation
- Road Boundary
- Pipeline Infrastructure
- Terminal Property Boundary

N

0 50 100

Feet

1 Inch = 50 Feet

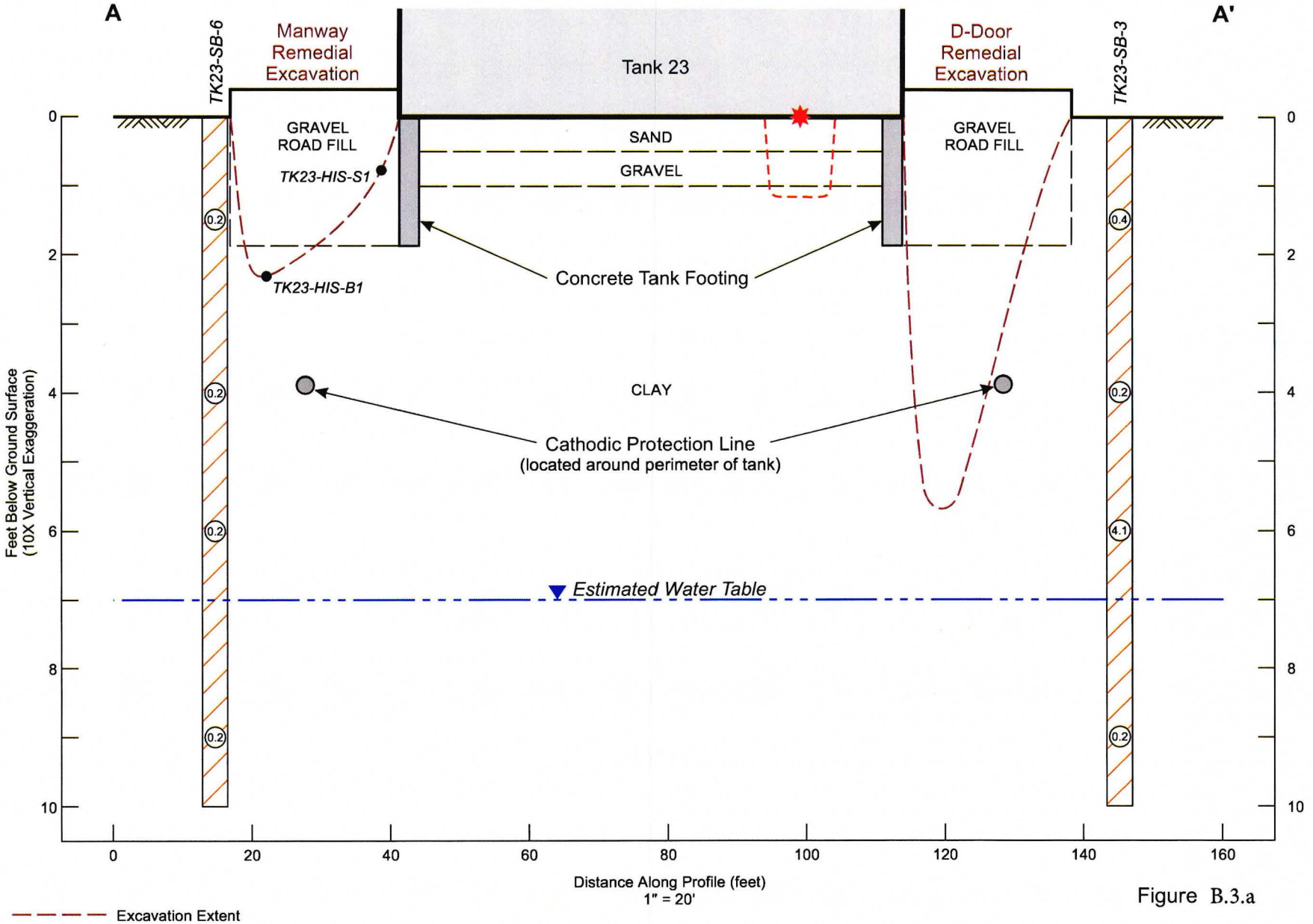
Figure B.2.c.

TANK 23 PRE/POST REMAINING SOIL CONTAMINATION SUPERIOR TERMINAL

Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

M:\Duluth\49 WI\16\49161092\WorkFiles\2013_3 Tank 23 Geoprobe\Conceptual Cross SectionA-A'.CDR RLG 05-21-13



Excavation Extent

Approximate Location of Known Diesel Impacts

(0.2) PID (ppm)

Sample Location

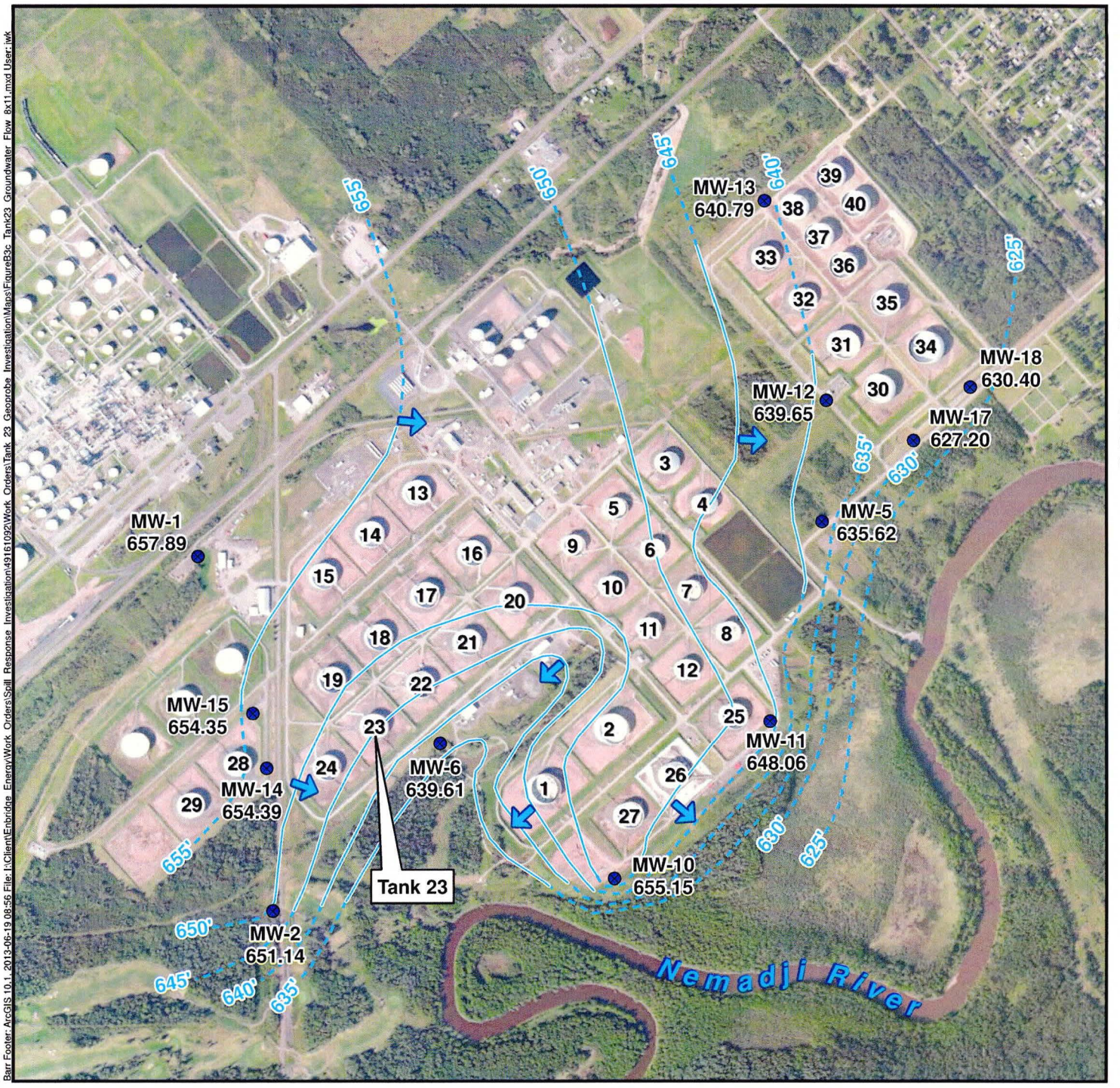
Figure B.3.a

CONCEPTUAL CROSS SECTION A-A'
TANK 23 HISTORICAL CONTAMINATION
Enbridge Superior Terminal
Superior, Wisconsin

Attachment B.*3.b*

Groundwater Isoconcentration

Not applicable - Groundwater was not encountered during this project



630.40 Monitoring Well Location and Groundwater Elevation (ft)

Groundwater Contour
Dashed where inferred
(Contour Interval = 5.0 ft)

Inferred Groundwater Flow Direction

Monitoring well groudwater elevations were measured on September 26, 2012

Note:
Monitoring well locations 17 and 18 are newly installed and were not used in groundwater contour modeling

N

0 1,000 2,000

Feet

1 Inch = 1,000 Feet

ESRI World Imagery Circa August, 2011

Figure B.3.c.

TANK 23 GROUNDWATER FLOW DIRECTION SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

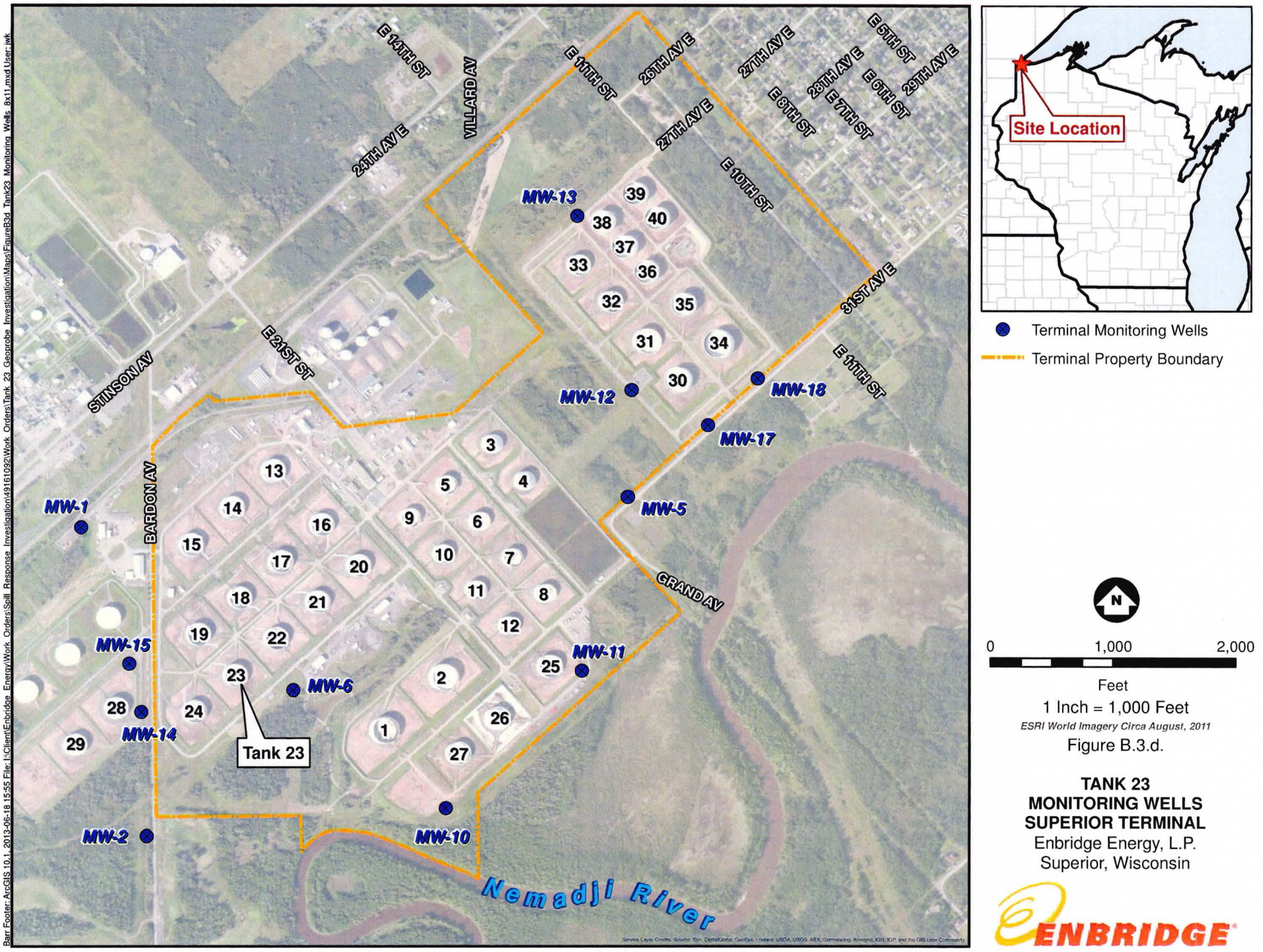


Figure B.3.d.

TANK 23
MONITORING WELLS
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Attachment B.*4.a-c*

Vapor Maps and Other Media

Not applicable - No vapor receptors were located within 100 feet of the site and there were no other media of concern

Attachment C.*1.*

Site Investigation Documentation

C.1.a.i-iv. - Site Investigation Field Sampling and Screening Logs

C.1.b. - Soil Boring Log Information – SB-1-9

ENBRIDGE SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Superior Terminal Tank 23

Equipment used: PID *-ionization detector with* 10.6 *eV lamp* Background Headspace: 0.0 ppm

Sample Nomenclature *(Location - sample type - #):* TK23-HIS-

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

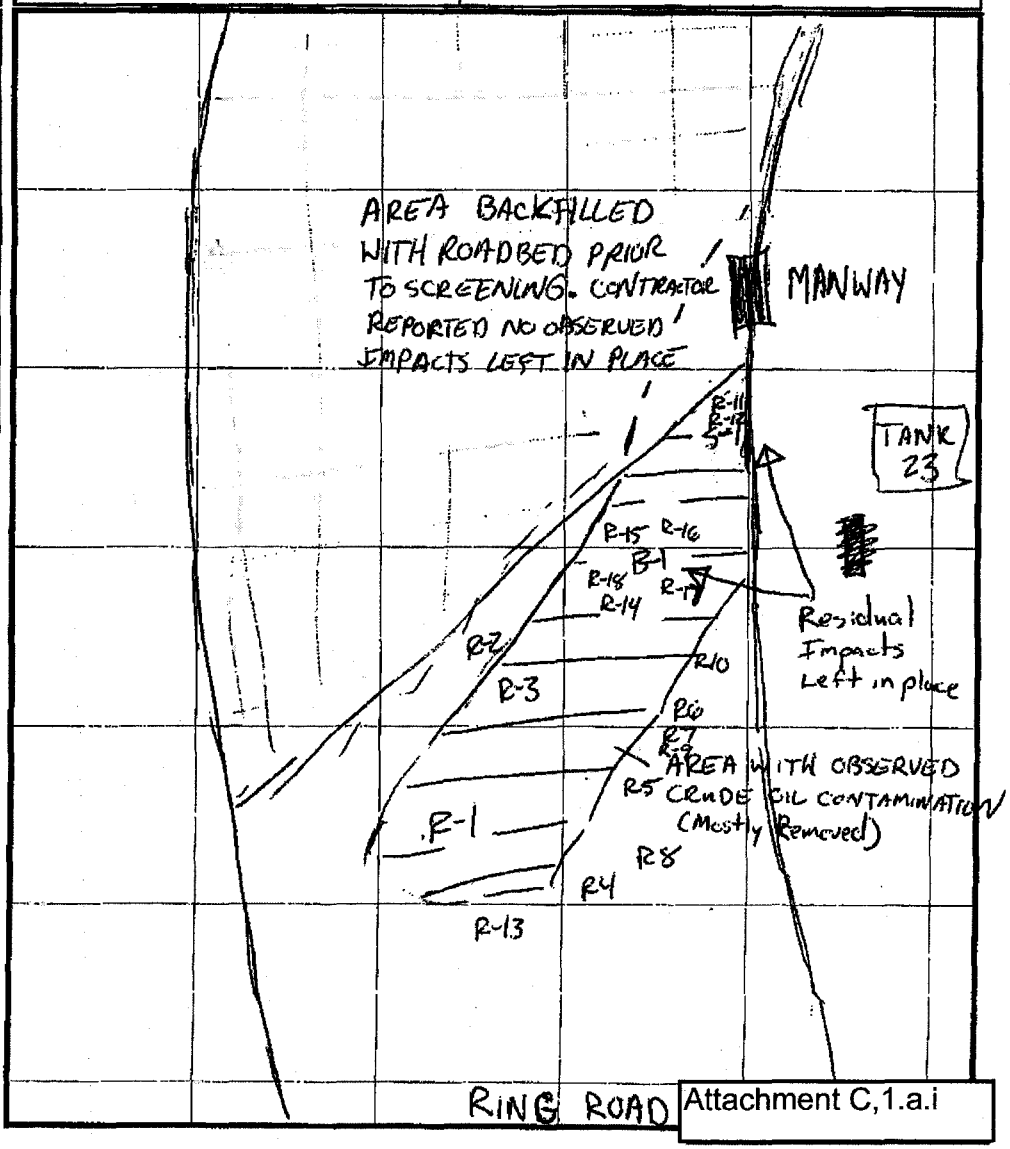
Date: 4/3/12

Sampler: CTF

Calibration Time:

Sample ID	Depth (ft)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: R-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
R-1	2		CL	RB N	N/N	0
R-2	1.5		CL	N	N/N	0.1
R-3	1		CL	N	N/N	0.1
R-4	1.4		CL	N	N/N	0.1
R-5	1.3		CL	N	N/N	0.1
R-6	1.4		CL	N	N/N	0.1
R-7	1.4		CL	Dark Discolor	N/N	0.1
R-8	1.4		CL	N	N/N	0
R-9	1.4		CL	N	N/N	0
R-10	1.4		CL	N	N/N	4.5
R-11	0.5		CL	N	Y/N	2.2
R-12	0.3		CL	Y	Y/Y strong odor	>10
R-13	0.2		CL	N	N/N	0.1
R-14	1.8		CL	N	Y/N	>10
R-15	1.8		CL	N	N/-	2.1
R-16	1.7		CL	Y	Y/-	>10
R-17	2.2		CL	Y	Y/-	>10
R-18	1		CL	Y	Y/-	6.0
B-1	2.2		CL	Y	Y/-	>10
S-1	0.5		CL	Y	Y/-	>10

SITE SKETCH: *north is up; excavation extents and depths, sample locations, structures, utilities, boring locations, wells, natural features...* ***1 inch/grid =*** 10 ***FEET***



Attachment C,1.a.i

ENBRIDGE SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Superior Terminal Tank 23 D-door

Equipment used: PID *-ionization detector with* 10.6 *eV lamp* Background Headspace:_____ppm

Sample Nomenclature *(Location - sample type - #)*:_____

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

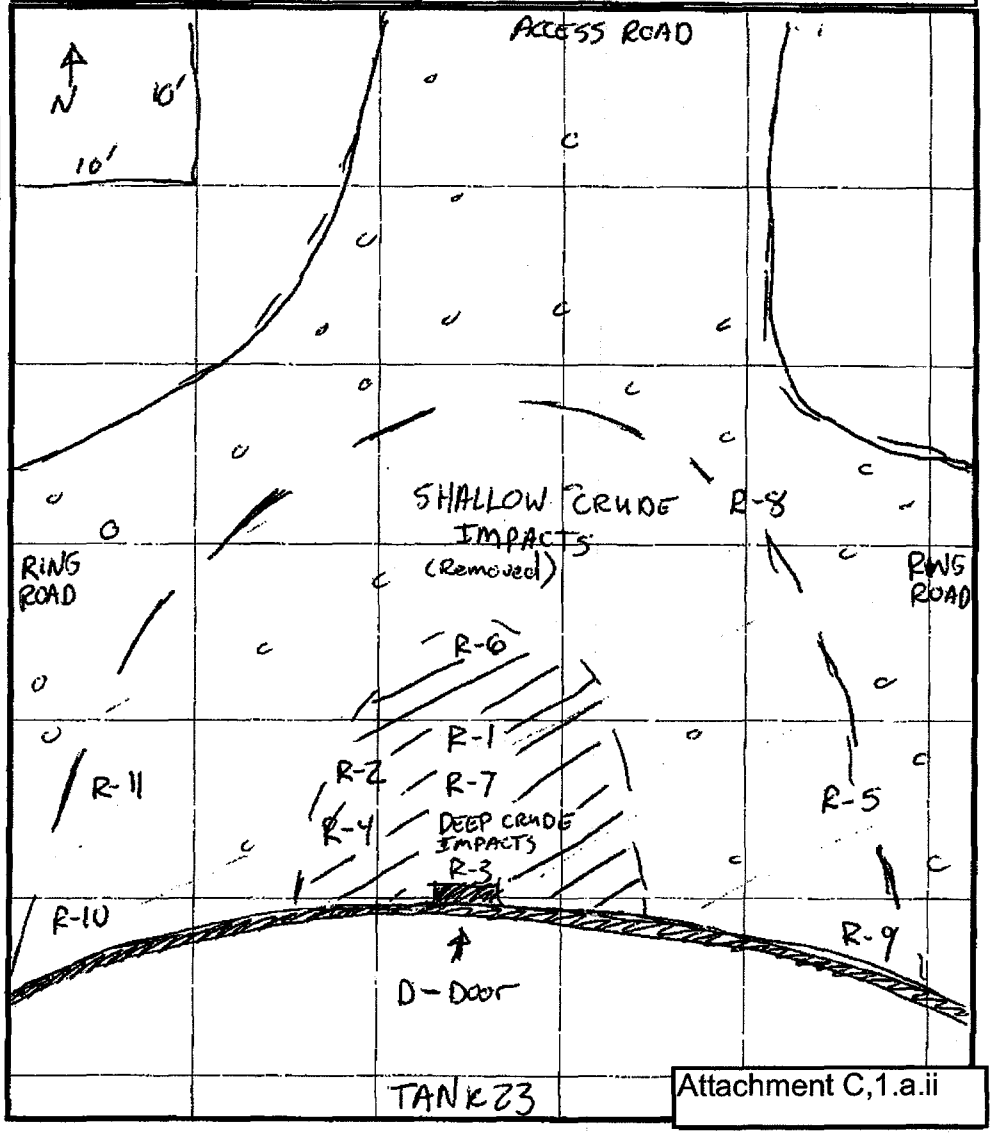
Date: 4/9/12

Sampler: BLJZ

Calibration Time:_____

Sample ID	Depth (ft)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: R-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
R-1	7		CL		weak/N	57
R-2	4		CL		N/N	182
R-3	4		CL		Petroleum/sheen	794
R-4	4		CL		N/N	101
R-5	2		CL		N/N	40.2
R-6	4		CL		N/N	125
R-7	8		CL		N/N	7.2
R-8	2		CL		N/N	3.0
R-9	2		CL		N/N	10.9
R-10	2		CL		N/N	0.1
R-11	2		CL		N/N	11.4

SITE SKETCH: *north is up; excavation extents and depths, sample locations, structures, utilities, boring locations, wells, natural features...* ***1 inch/grid =*** 10 ***FEET***



Attachment C,1.a.ii

ENBRIDGE SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Superior Terminal Tank 23 mixer

Equipment used: PID *-ionization detector with* 10.6 *eV lamp* Background Headspace: _____ ppm

Sample Nomenclature *(Location - sample type - #)*: _____

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

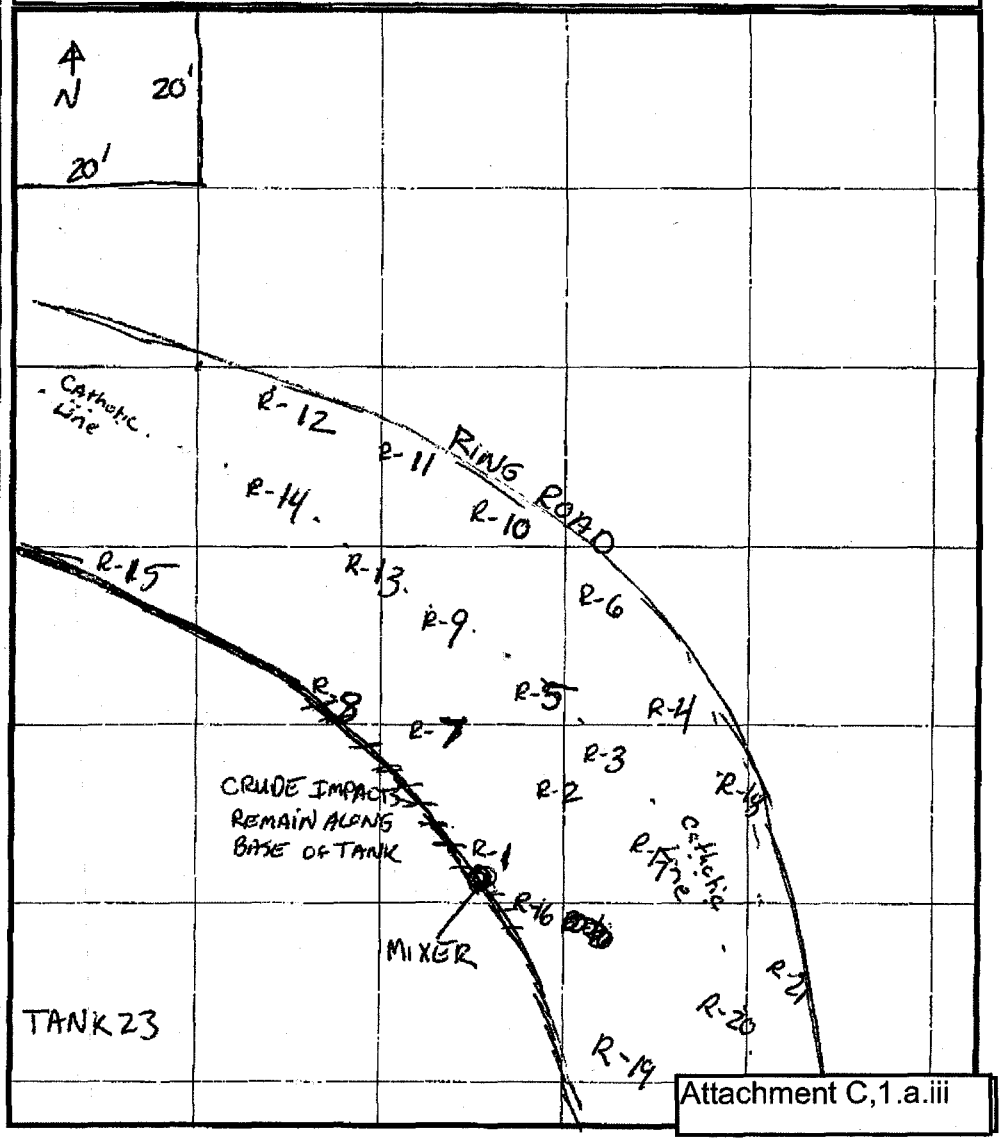
Date: 4/9/12 4/10/12

Sampler: REE BLJZ

Calibration Time: 730

Sample ID	Depth (ft)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: R-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
4/9 R-1	2		CL	Dark discolor	Petroleum/Y	150 +
R-2	2		CL	Red Brown/N	N/N	3.1
R-3	4		CL		weak color/N	1.3
R-4	2		CL		N/N	0.3
R-5	4		CL		N/N	0.3
R-6	2		CL		N/N	0.2
R-7	2		CL	⇓	N/N	0.6
R-8	2		CL	Dark discolor	N/N	7.7
R-9	2		CL	Red brown/N	N/N	0.1
R-10	2		CL		N/N	1.9
R-11	2		CL		N/N	0.0
R-12	2		CL		N/N	0.0
R-13	2		CL		N/N	0.3
R-14	2		CL		N/N	0.0
R-15	2		CL		N/N	0.0
4/10 R-16	2		CL		N/N	56
R-17	2		CL		N/N	1.7
R-18	2		CL		N/N	3.0
R-19	2		CL		N/N	0.5
R-20	2		CL		N/N	0.4
R-21	2		CL	⇓	N/N	0.4

SITE SKETCH: north is up; excavation extents and depths, sample locations, structures, utilities, boring locations, wells, natural features... ***1 inch/grid*** = 20 ***FEET***



Attachment C,1.a.iii

ENBRIDGE SITE INVESTIGATION FIELD SAMPLING AND SCREENING LOG

Location: *Milepost or Facility* Tank 23 Floor Repair

Equipment used: PID *-ionization detector with* 10.6 *eV lamp* Background Headspace: 0 ppm

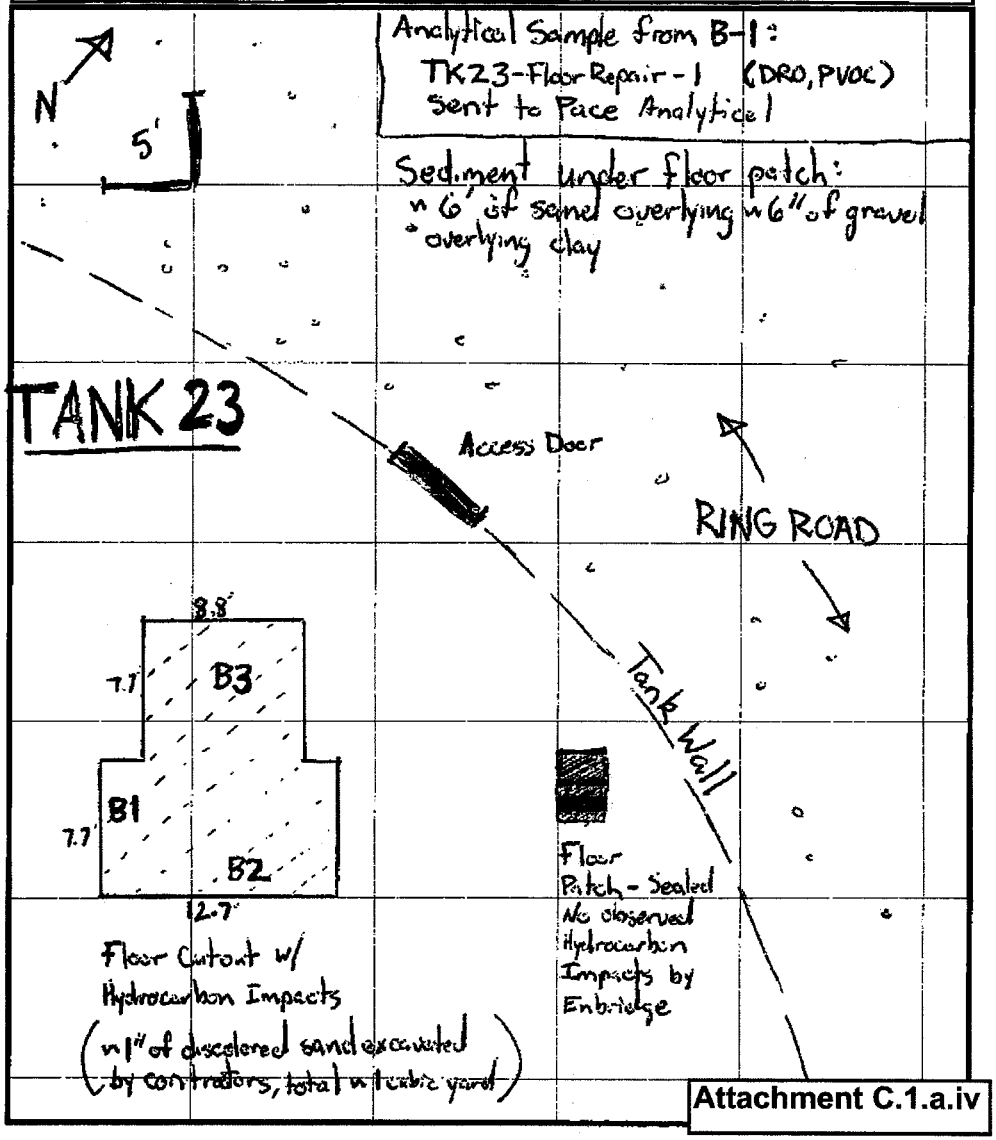
Date: 1/31/13
Sampler: REG
Calibration Time: 1300

Sample Nomenclature *(Location - sample type - #):* TK23 - Floor Repair -

Soil Sample Types: **R** = *Removed Sample* ; **S** = *Sidewall Sample* ; **B** = *Bottom Sample* ; **Stockpile** = *Stockpile Sample*

Sample ID	Depth (ft)	Time (military)	Soil Type (USCS)	Color/ Discolor	Odor/ Sheen	Headspace Reading (ppm)
Example: R-1	4	16:30	CL	Reddish brown	Petroleum/ Rainbow	275
B-1	.1		SP	Dark brown/black	PET/	150
B-2	.4		SP	brown	PET/	163
B-3	.8		GP/SP	brown	PET/	156

SITE SKETCH: *north is up; excavation extents and depths, sample locations, structures, utilities, boring locations, wells, natural features...* ***1 inch/grid =*** ***FEET***



Attachment C.1.a.iv

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-01

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Environmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		650.3 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W

Lat 46° 41' 3.3"
Long 92° 3' 47.9"

Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color		RQD/ Comments
1 GP	60 48		0	0.0-2.5': (fill) Crushed rock, gray (10YR 5/1), angular.	FILL			0.1	N/N/N	Moist	95/5/0	5YR 5/1		
			2	2.5-15.0': FAT CLAY (CH), reddish brown (5YR 5/4).				0.1	N/N/N	Moist	0/0/100	10YR 5/4		
2 GP	60 60		4											
			6					0.1	N/N/N	Moist	0/0/100	10YR 5/4		
			8		CH			0.1	N/N/N	Moist	0/0/100	10YR 5/4		
3 GP	60 36		10											
			12					0.1	N/N/N	Moist	0/0/100	10YR 5/4		
			14					0.1	N/N/N	Moist	0/0/100	10YR 5/4		
				End of boring.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

s 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-02

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Envrionmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		650.4 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W
Lat 46° 41' 4.1" Long 92° 3' 48.2"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color	RQD/ Comments
1 GP	60 60		0	0.0-0.5': (fill) Crushed rock, gray (10YR 5/1), angular.	FILL								
				0.5-10.0': FAT CLAY (CH), reddish brown (5YR 5/4), frost to 2.5 feet.				0.1	N/N/N	Moist	0/0/100	5YR 5/4	
			2										
			4					0.1	N/N/N	Moist	0/0/100	5YR 5/4	
2 GP	60 54				CH								
			6					0.1	N/N/N	Moist	0/0/100	5YR 5/4	
			8										
								0.1	N/N/N	Moist	0/0/100	5YR 5/4	
			10	End of boring.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

; 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-03

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Environmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		652.0 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W

Lat 46° 41' 4.5"
Long 92° 3' 49.4"

Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color	RQD/ Comments
1 GP	60 / 60		0	0.0-2.0': (fill) Crushed rock, gray (10YR 5/1), angular.	FILL			0.4	N/N/N	Moist	95/5/0	10R 5/1	
			2	2.0-10': FAT CLAY (CH), reddish brown (5YR 5/4), frost to 3.0 feet.				0.2	N/N/N	Moist	0/0/100	5YR 5/4	
2 GP	60 / 60		4		CH								
			6					4.9	N/N/N	Moist	0/0/100	5YR 5/4	
			8					0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			10	End of boring.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

s 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-04

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Environmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		651.2 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W
Lat 46° 41' 4.5" Long 92° 3' 50.2"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color	RQD/ Comments
1 GP	60 60		0	0.0-0.5': (fill) Crushed rock, gray (10YR 5/1), angular.	FL								
				0.5-10.0': FAT CLAY (CH), reddish brown (5YR 5/4), frost to 4.0 feet.				0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			2										
			4					0.1	N/Y/N	Moist	0/0/100	5YR 5/4	
2 GP	60 60				CH								
			6	6.0': 1/4 inch gray silt lense				0.1	N/N/N	Moist	0/0/100	5YR 5/4	
			8										
								0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			10	End of boring.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

s 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-05

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Environmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		651.0 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W
Lat 46° 41' 3.9" Long 92° 3' 51.1"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color	RQD/ Comments
1 GP	60 / 48		0	0.0-0.5': (fill) Crushed rock, gray (10YR 5/1), angular.	FL								
				0.5-10.0': FAT CLAY (CH), soft, reddish brown (5YR 5/4).				0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			2										
			4					0.2	N/N/N	Moist	0/0/100	5YR 5/4	
2 GP	60 / 60				CH								
			6					0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			8										
								0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			10	End of boring.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

; 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-06

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Environmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		650.8 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W

Lat 46° 41' 3.4"
Long 92° 3' 51.3"

Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color	RQD/ Comments
1 GP	60 / 60		0	0.0-0.5': (fill) Crushed rock, gray (10YR 5/1), angular.	FL								
				0.5-10.0': FAT CLAY (CH), reddish brown (5YR 5/4).				0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			2					0.3	N/N/N	Moist	0/0/100	5YR 5/4	
2 GP	60 / 60		4		CH								
			6	6.5': 1/4 inch light gray silt lenses at 6.5 and 8.0 feet.				0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			8					0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			10	End of boring.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

s 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-07

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Environmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		650.3 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W

Lat 46° 41' 2.9"
Long 92° 3' 51.2"

Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color	RQD/ Comments
1 GP	60 54		0	0.0-1.5': (fill) Crushed rock, gray (10YR 5/1), angular.	FL								
			2	1.5-10.0': FAT CLAY (CH), reddish brown (5YR 5/4), frost to 3.5 feet.				0.2	N/N/N	Moist	0/0/100	5YR 5/4	
				3.0': some 1/4" thick, gray silt lenses from 3.0 to 5.0 feet.									
			4					0.3	N/N/N	Moist	0/0/100	5YR 5/4	
2 GP	60 60				CH								
			6					0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			8										
								0.2	N/N/N	Moist	0/0/100	5YR 5/4	
			10	End of boring.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

s 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-08

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Environmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		650.8 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W
Lat 46° 41' 2.3" Long 92° 3' 50.3"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color	RQD/ Comments
1 GP	60 42		0	0.0-1.5': (fill) Crushed rock, gray (10YR 5/1), angular.	FL								
			2	1.5-10.0': FAT CLAY (CH), reddish brown (5YR 5/4), frost to 3.0 feet.				0.3	N/N/N	Moist	95/5/0	10YR 5/1	
			4					0.3	N/N/N	Moist	0/0/100	5YR 5/4	
2 GP	60 24		6		CH			0.3	N/N/N	Moist	0/0/100	5YR 5/4	
			8										
			10	End of boring.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

; 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Tank 23 Geoprobe Investigation	N/A	TK23-SB-09

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Samuel Atazadeh Matrix Environmental	3/26/2013	3/26/2013	Direct Push

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
N/A	N/A	N/A		651.1 Feet	2.0 inches

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☐
State Plane N, E S/C/N
NW 1/4 of SE 1/4 of Section 36, T 49 N, R 14 W
Lat 46° 41' 2.2" Long 92° 3' 49.4"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
816010580	Douglas	16	Superior

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID (ppm)	Soil Properties: Odor/St/Sh	Moisture Content	G/S/F %	Color	RQD/ Comments
	60 60		0	0.0-0.75': (fill) Crushed rock, gray (10YR 5/1), angular.	FL								
				0.75-15.0': FAT CLAY (CH), reddish brown (5YR 5/4), frost to 3.0 feet.				0.2	N/N/N	moist	0/0/100	5YR 5/4	
			2										
			4					0.2	N/N/N	moist	0/0/100	5YR 5/4	
	60 60												
			6					0.2	N/N/N	moist	0/0/100	5YR 5/4	
			8		CH			0.2	N/N/N	moist	0/0/100	5YR 5/4	
	60 60		10										
								0.1	N/N/N	moist	0/0/100	5YR 5/4	
			12										
			14					0.1	N/N/N	moist	0/0/100	5YR 5/4	
				End of boring.									

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Ryan Erickson

Firm Barr Engineering
332 W Superior St Duluth, MN 55802
Tel:
Fax:

s 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Attachment C.*2.*

Investigative Waste Disposal Documentation

Waste Profile Sheet

Shamrock Landfill

P.O. Number	Customer Code	SKB Representative Jon Penheiter	CL

I. Generator Information

Generator Name: Enbridge Pipelines Limited Partnership, LLC		Generator EPA ID Number	SIC Code
Generator Location: Enbridge Superior Terminal - TANK 23	County: Douglas	Generator Contact: Paul Turner	
		Phone: 715-398-4752	Fax: 715-398-3223
Generator Mailing Address (if different: 1320 Grand Ave, Superior, WI 54880		Generator Email Address: paul.turner@enbridge.com	
Bill To Name & Address: Enbridge Energy, 1100 Louisiana Ave, STE. 3300, Houston, TX 77002	Bill To #:	Billing Contact: Paul Turner	
		Phone: 715-398-9192	Fax: 715-398-3223
Invoice Contact:		Billing Email Address: paul.turner@enbridge.com	

II. Waste Generation Information

Waste Name: Crude contaminated soil from Tank 23.	Estimated rate of waste generation: 500 ☐ Lbs. ☐ tons ☒ cy ☐ drums	☒ one time ☐ yearly
Generator Facility Operations and/or Site History: Enbridge Pipeline Terminal		
Describe the generating process or source of contaminated soil/debris and/or waste: Pipeline Terminal Activities		

III. Waste Composition and Constituents (list all known)

	Actual Range %	ppm
Crude contaminated soil	100	

IV. Waste Properties

Physical state:	Free Liquids:	pH Range:	Flash point:	Color:	Odor (describe):
☒ Solid ☐ Liquid ☐ Sludge ☐ Gas	☐ Yes ☒ No Content _____%	☐ <2 ☐ 2-4 ☐ 5-8 ☐ 8-12.4 ☐ >12.5	☐ ≤ 140°F ☐ > 140°F to < 200°F ☐ > 200°F	Brown	petroleum odor

V. Waste Classification

Waste stream properties (answer ALL questions)			Does this waste contain absorbents?	☐ Yes	☒ No
Does this waste stream contain any D, F, K, U or P listed as hazardous waste, either in pure form, as a mixture, or treatment residue?	☐ Yes	☒ No	Is this waste lethal (by Minn. Rules 7045.0131 Subp. 6)?	☐ Yes	☒ No
Does this waste stream contain PCB material	☐ Yes	☒ No	Is this waste recyclable?	☐ Yes	☒ No
If yes, concentration: _____ppm			Is this waste explosive?	☐ Yes	☒ No
Does this waste stream contain fuming acids?	☐ Yes	☒ No	Is this waste infectious?	☐ Yes	☒ No
Does this waste contain asbestos?	☐ Yes	☒ No	Is this putrescible waste?	☐ Yes	☒ No
Does this waste contain oxidizers?	☐ Yes	☒ No	Is this waste demolition debris?	☐ Yes	☒ No
Does this waste contain radioactive material?	☐ Yes	☒ No	Is this waste sewer sludge?	☐ Yes	☒ No

Please attach any available information or analytical test results that have previously been performed on this waste that substantiates these determinations. Include MSDS's and any information from other agencies (i.e., MPCA, USEPA)

VI. Shipping Information

Proper DOT Shipping Name (per CFR 172.101) where applicable			
Reportable Quantity	DOT Hazard Class	UN/NA Number	Packing Group
Method of packaging: ☐ drums (size _____) ☒ Bulk Solids ☐ boxes (size _____)		Method of shipment ☐ Roll-off ☒ End dump ☐ Rail ☐ Other (Specify) _____	

VII. Certification of Non Hazardous Waste & Approval Conditions

I hereby certify and warrant, on behalf of the generator and myself that, to the best of my knowledge and belief, the information contained herein is accurate, and true and that the waste is nonhazardous as defined in Title 42, Unites States Code Section 6903, Minnesota Statute Section 116.06, Subdivision 13, and/or any rules adopted by the Minnesota Pollution Control Agency under Minnesota Statute Section 116.07.

I understand that any approval is no longer valid if there are any changes in the process generating the waste or there have been changes in the composition of the waste. Therefore, if the composition of the waste stream changes or potentially changes, I or someone representing the generator, will immediately notify SKB Environmental. I, on behalf of the generator, hereby agree to fully indemnify SKB Environmental for any damages and/or costs incurred as a result of this certification being inaccurate or untrue.

Signature	Printed Name	Title	Date
	Paul Turner	Sr. Environmental Analyst	4-16-12

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

April 16, 2012

Andrea Nord
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RE: Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Dear Andrea Nord:
Enclosed are the analytical results for sample(s) received by the laboratory on April 06, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Andrea Opland

andrea.opland@pacelabs.com
Project Manager

Enclosures

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Minnesota Certification IDs
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10187988001	**TK23-Stockpile-1**	Solid	04/03/12 08:45	04/06/12 10:08
10187988002	**TK23-Stockpile-2**	Solid	04/03/12 08:55	04/06/12 10:08

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10187988001	**TK23-Stockpile-1**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	KT1	5	PASI-M
		% Moisture	JDL	1	PASI-M
10187988002	**TK23-Stockpile-2**	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	KT1	5	PASI-M
		% Moisture	JDL	1	PASI-M

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Method: **WI MOD DRO**
Description: WIDRO GCS
Client: Barr Engineering
Date: April 16, 2012

General Information:
2 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

QC Batch: OEXT/18263

G2: The sample weight in the container did not meet method specifications.
- TK23-Stockpile-1 (Lab ID: 10187988001)
- TK23-Stockpile-2 (Lab ID: 10187988002)

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: OEXT/18263

S4: Surrogate recovery not evaluated against control limits due to sample dilution.
- TK23-Stockpile-1 (Lab ID: 10187988001)
  - n-Triacontane (S)
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - n-Triacontane (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Method: **WI MOD DRO**
Description: WIDRO GCS
Client: Barr Engineering
Date: April 16, 2012

Analyte Comments:

QC Batch: OEXT/18263

2M: The sample was re-weighed into a new container because the sample was received in a clear container.
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - n-Triacontane (S)

3M: The sample was re-weighed into a new container because the sample was received in a clear container.
- TK23-Stockpile-1 (Lab ID: 10187988001)
  - n-Triacontane (S)

T6: High boiling point hydrocarbons are present in the sample.
- TK23-Stockpile-1 (Lab ID: 10187988001)
  - Diesel Range Organics
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - Diesel Range Organics

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Method: **WI MOD GRO**
Description: WIGRO GCV
Client: Barr Engineering
Date: April 16, 2012

General Information:
2 samples were analyzed for WI MOD GRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with TPH GRO/PVOC WI ext. with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: GCV/9134

1M: Surrogate recovery outside laboratory control limits due to matrix interferences.

- TK23-Stockpile-1 (Lab ID: 10187988001)
  - a,a,a-Trifluorotoluene (S)
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - a,a,a-Trifluorotoluene (S)

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Method: **WI MOD GRO**
Description: WIGRO GCV
Client: Barr Engineering
Date: April 16, 2012

Analyte Comments:

QC Batch: GCV/9134

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

- TK23-Stockpile-1 (Lab ID: 10187988001)
  - a,a,a-Trifluorotoluene (S)
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - a,a,a-Trifluorotoluene (S)

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Sample: TK23-Stockpile-1 **Lab ID: 10187988001** Collected: 04/03/12 08:45 Received: 04/06/12 10:08 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**5400**	mg/kg	1320	145	50	04/10/12 09:07	04/12/12 10:42		T6
Surrogates									
n-Triacontane (S)	0	%	50-150		50	04/10/12 09:07	04/12/12 10:42		3M,G2, S4
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: TPH GRO/PVOC WI ext.								
Benzene	ND	mg/kg	0.14	0.017	2	04/09/12 15:13	04/12/12 07:04	71-43-2	
Ethylbenzene	**1.1**	mg/kg	0.14	0.023	2	04/09/12 15:13	04/12/12 07:04	100-41-4	
Toluene	ND	mg/kg	0.14	0.017	2	04/09/12 15:13	04/12/12 07:04	108-88-3	
Xylene (Total)	**1.5**	mg/kg	0.43	0.046	2	04/09/12 15:13	04/12/12 07:04	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	64	%	80-125		2	04/09/12 15:13	04/12/12 07:04	98-08-8	1M,D3
Dry Weight	Analytical Method: % Moisture								
Percent Moisture	**21.1**	%	0.10	0.10	1		04/09/12 00:00		

Sample: TK23-Stockpile-2 **Lab ID: 10187988002** Collected: 04/03/12 08:55 Received: 04/06/12 10:08 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**6120**	mg/kg	1140	125	50	04/10/12 09:07	04/12/12 10:35		T6
Surrogates									
n-Triacontane (S)	0	%	50-150		50	04/10/12 09:07	04/12/12 10:35		2M,G2, S4
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: TPH GRO/PVOC WI ext.								
Benzene	**1.0**	mg/kg	0.73	0.088	10	04/09/12 15:13	04/10/12 23:21	71-43-2	
Ethylbenzene	**8.4**	mg/kg	0.73	0.12	10	04/09/12 15:13	04/10/12 23:21	100-41-4	
Toluene	ND	mg/kg	0.73	0.088	10	04/09/12 15:13	04/10/12 23:21	108-88-3	
Xylene (Total)	**10.7**	mg/kg	2.2	0.23	10	04/09/12 15:13	04/10/12 23:21	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	61	%	80-125		10	04/09/12 15:13	04/10/12 23:21	98-08-8	1M,D3
Dry Weight	Analytical Method: % Moisture								
Percent Moisture	**20.8**	%	0.10	0.10	1		04/09/12 00:00		

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

QC Batch: GCV/9134 — Analysis Method: WI MOD GRO
QC Batch Method: TPH GRO/PVOC WI ext. — Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10187988001, 10187988002

METHOD BLANK: 1170322 — Matrix: Solid
Associated Lab Samples: 10187988001, 10187988002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/kg	ND	0.050	04/10/12 18:01	
Ethylbenzene	mg/kg	ND	0.050	04/10/12 18:01	
Toluene	mg/kg	ND	0.050	04/10/12 18:01	
Xylene (Total)	mg/kg	ND	0.15	04/10/12 18:01	
a,a,a-Trifluorotoluene (S)	%	99	80-125	04/10/12 18:01	

LABORATORY CONTROL SAMPLE & LCSD: 1170323 1170324

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	mg/kg	5	4.7	5.1	94	101	80-120	7	20	
Ethylbenzene	mg/kg	5	4.8	5.0	96	101	80-120	5	20	
Toluene	mg/kg	5	4.8	5.0	96	101	80-120	5	20	
Xylene (Total)	mg/kg	15	14.4	14.9	96	99	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				95	99	80-125			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1170325 1170326

Parameter	Units	10187822001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	mg/kg	ND	5.4	5.3	5.5	5.2	102	98	80-120	5	20	
Ethylbenzene	mg/kg	ND	5.4	5.3	5.7	5.4	106	102	80-120	5	20	
Toluene	mg/kg	ND	5.4	5.3	5.6	5.4	105	101	80-120	5	20	
Xylene (Total)	mg/kg	ND	16.1	15.9	17.1	16.3	106	102	80-120	5	20	
a,a,a-Trifluorotoluene (S)	%						95	95	80-125			

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

QC Batch: MPRP/31700
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10187988001, 10187988002

SAMPLE DUPLICATE: 1169981

Parameter	Units	10186121004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.7	20.3	7	30	

SAMPLE DUPLICATE: 1169982

Parameter	Units	10188022002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.2	6.8	9	30	

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

QC Batch: OEXT/18263 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 10187988001, 10187988002

METHOD BLANK: 1170584 Matrix: Solid
Associated Lab Samples: 10187988001, 10187988002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range Organics	mg/kg	ND	5.0	04/12/12 08:03	
n-Triacontane (S)	%	71	50-150	04/12/12 08:03	

LABORATORY CONTROL SAMPLE & LCSD: 1170585 1170586

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Diesel Range Organics	mg/kg	80	61.7	61.2	77	76	70-120	.9	20	
n-Triacontane (S)	%				79	78	50-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1170587 1170588

Parameter	Units	10187816009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Range Organics	mg/kg	ND	72.4	72.7	57.2	52.4	77	70	70-120	9	20	
n-Triacontane (S)	%						79	71	50-150			

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M	Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

1M	Surrogate recovery outside laboratory control limits due to matrix interferences.
2M	The sample was re-weighed into a new container because the sample was received in a clear container.
3M	The sample was re-weighed into a new container because the sample was received in a clear container.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
G2	The sample weight in the container did not meet method specifications.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
T6	High boiling point hydrocarbons are present in the sample.

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10187988001	**TK23-Stockpile-1**	WI MOD DRO	OEXT/18263	WI MOD DRO	GCSV/9391
10187988002	**TK23-Stockpile-2**	WI MOD DRO	OEXT/18263	WI MOD DRO	GCSV/9391
10187988001	**TK23-Stockpile-1**	TPH GRO/PVOC WI ext.	GCV/9134	WI MOD GRO	GCV/9135
10187988002	**TK23-Stockpile-2**	TPH GRO/PVOC WI ext.	GCV/9134	WI MOD GRO	GCV/9135
10187988001	**TK23-Stockpile-1**	% Moisture	MPRP/31700		
10187988002	**TK23-Stockpile-2**	% Moisture	MPRP/31700		

10187988 1134

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 49161092

Project Name: Enbridge Tank 23: Historical Impacts Study - SP

Sample Origination State WI (use two letter postal state abbreviation)

COC Number: № 35220

COC 1 of 1

Project Manager: HAW

Project QC Contact: Andrea Nord

Sampled by: GTF

Laboratory: Pace

	Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Number of Containers/Preservative — Water: VOCs (HCl) #1	SVOCs (unpreserved) #2	Dissolved Metals (HNO_3)	Total Metals (HNO_3)	General (unpreserved) #3	Diesel Range Organics (HCl)	Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	GRO, BTEX (tared MeOH) #1	DRO (tared unpreserved) WI	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.) moisture	Total Number Of Containers
1.	TK23-Stockpile-1	—			4/3/2012	8:45		X		X										X	X			X	3
2.	TK23-Stockpile-2	—			4/3/2012	8:55		X		X										X	X			X	3
3.																									
4.																									
5.																									
6.																									
7.																									
8.																									
9.																									
10.																									

RUSH!
4/6/12
AMF

Rush
TAT

001
002

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
[signature]	(Y) N	4/5/2012	1520	[signature] Pace T=3.9	4/6/12	1008
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other: _____

Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09\01\09

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

April 13, 2012

Ms. Andrea Nord
Barr Engineering Co.
4700 W 77th St
Minneapolis, MN 55435

Work Order Number: 1201613
RE: 49161092

Enclosed are the results of analyses for samples received by the laboratory on 04/11/12. If you have any questions concerning this report, please feel free to contact me.

All samples will be retained by LEGEND, unless consumed in the analysis, for 30 days from the date of this report and then discarded unless other arrangements are made.

WI Certification #998022410

Prepared by,
LEGEND TECHNICAL SERVICES, INC

Bach Pham
Client Manager I
bpham@legend-group.com

Tyler Jones
Chemist I
tjones@legend-group.com

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TK23-Stockpile-3_0-0	1201613-01	Soil	04/10/12 12:07	04/11/12 08:30

Shipping Container Information

Default Cooler Temperature (°C):

Received on ice: No
Temperature blank was not present
Received on ice pack: No
Received on melt water: No
Ambient: Yes
Acceptable (IH/ISO only): No
Custody seals: No

Case Narrative:

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

DRO/8015B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TK23-Stockpile-3_0-0 (1201613-01) Soil	**Sampled: 04/10/12 12:07**			**Received: 04/11/12 8:30**						
Diesel Range Organics	**180**	9.3	1.5	mg/kg dry	1	B2D1102	04/11/12	04/11/12	WI(95) DRO	
Surrogate: C-30	*100*			*70-130 %*		"	"	"	"	

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

WI(95) GRO/8015B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TK23-Stockpile-3_0-0 (1201613-01) Soil	**Sampled: 04/10/12 12:07**			**Received: 04/11/12 8:30**						
Benzene	<0.035	0.035	0.0053	mg/kg dry	1	B2D1108	04/11/12	04/12/12	WI(95) GRO	
Ethylbenzene	<0.035	0.035	0.0065	mg/kg dry	1	"	"	"	"	
Toluene	<0.035	0.035	0.0033	mg/kg dry	1	"	"	"	"	
Xylenes (total)	<0.10	0.10	0.017	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Fluorochlorobenzene	*89.8*			*80-150 %*		"	"	"	"	

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

PERCENT SOLIDS
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TK23-Stockpile-3_0-0 (1201613-01) Soil	**Sampled: 04/10/12 12:07**			**Received: 04/11/12 8:30**						
% Solids	**78**			%	1	B2D1213	04/12/12	04/12/12	% calculation	

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

DRO/8015B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B2D1102 - Sonication (Wisc DRO)											
Blank (B2D1102-BLK1)					Prepared & Analyzed: 04/11/12						
Diesel Range Organics	< 8.0	8.0	1.3	mg/kg wet							
Surrogate: C-30	*13.9*			*mg/kg wet*	*16.0*		*87.1*	*70-130*			
LCS (B2D1102-BS1)					Prepared & Analyzed: 04/11/12						
Diesel Range Organics	61.6	8.0	1.3	mg/kg wet	64.0		96.3	70-120			
Surrogate: C-30	*15.4*			*mg/kg wet*	*16.0*		*96.4*	*70-130*			
LCS Dup (B2D1102-BSD1)					Prepared: 04/11/12 Analyzed: 04/13/12						
Diesel Range Organics	63.5	8.0	1.3	mg/kg wet	64.0		99.3	70-120	3.04	20	
Surrogate: C-30	*15.2*			*mg/kg wet*	*16.0*		*95.1*	*70-130*			

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project: 49161092	
4700 W 77th St	Project Number: 49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager: Ms. Andrea Nord	Date Reported: 04/13/12

WI(95) GRO/8015B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B2D1108 - EPA 5035 Soil (Purge and Trap)											
Blank (B2D1108-BLK1)					Prepared & Analyzed: 04/11/12						
Benzene	< 0.025	0.025	0.0038	mg/kg wet							
Ethylbenzene	< 0.025	0.025	0.0047	mg/kg wet							
Toluene	< 0.025	0.025	0.0024	mg/kg wet							
Xylenes (total)	< 0.075	0.075	0.012	mg/kg wet							
Surrogate: 4-Fluorochlorobenzene	*22.9*			*ug/L*	*25.0*		*91.8*	*80-150*			
LCS (B2D1108-BS1)					Prepared & Analyzed: 04/11/12						
Benzene	93.2			ug/L	100		93.2	80-120			
Ethylbenzene	99.6			ug/L	100		99.6	80-120			
Toluene	97.0			ug/L	100		97.0	80-120			
Xylenes (total)	307			ug/L	300		102	80-120			
Surrogate: 4-Fluorochlorobenzene	*25.3*			*ug/L*	*25.0*		*101*	*80-150*			
LCS Dup (B2D1108-BSD1)					Prepared & Analyzed: 04/11/12						
Benzene	92.9			ug/L	100		92.9	80-120	0.286	20	
Ethylbenzene	98.7			ug/L	100		98.7	80-120	0.920	20	
Toluene	96.4			ug/L	100		96.4	80-120	0.651	20	
Xylenes (total)	307			ug/L	300		102	80-120	0.0853	20	
Surrogate: 4-Fluorochlorobenzene	*24.6*			*ug/L*	*25.0*		*98.3*	*80-150*			
Matrix Spike (B2D1108-MS1)		**Source: 1201613-01**			Prepared & Analyzed: 04/11/12						
Benzene	92.5			ug/L	100	<	92.5	80-120			
Ethylbenzene	99.5			ug/L	100	0.136	99.4	80-120			
Toluene	96.1			ug/L	100	0.419	95.7	80-120			
Xylenes (total)	310			ug/L	300	0.461	103	80-120			
Surrogate: 4-Fluorochlorobenzene	*24.8*			*ug/L*	*25.0*		*99.0*	*80-150*			

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

PERCENT SOLIDS - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B2D1213 - General Preparation											
Duplicate (B2D1213-DUP1)		**Source: 1201647-01**			Prepared & Analyzed: 04/12/12						
% Solids	85.0			%		90.0			5.71	20	

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

Notes and Definitions

<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

Legend Technical Services, Inc.

120116l3

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Enbridge
-Please rush TAT-

COC	1 of 1
Project Manager:	REE
Project QC Contact:	AAN
Sampled by:	BJZ2
Laboratory:	Legend

Project Number: ~~Tank~~ 49161092 resp tank 23

Project Name: Tank 23

Sample Origination State WI (use two letter postal state abbreviation)

COC Number: № 32233

	Location	Start Depth	Stop Depth	Depth Unit (m/ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Water: VOCs (HCl) #1	Water: SVOCs (unpreserved) #2	Water: Dissolved Metals (HNO3)	Water: Total Metals (HNO3)	Water: General (unpreserved) #3	Water: Diesel Range Organics (HCl)	Water: Nutrients (H2SO4) #4	Water	Water	Water	Soil: VOCs (tared MeOH) #1	Soil: GRO, BTEX (tared MeOH) #5	Soil: DRO (tared unpreserved)	Soil: Metals (unpreserved)	Soil: SVOCs (unpreserved) #2	Soil: % Solids (plastic vial, unpres.)	Soil: BTEX (MeoH preserved)	Total Number Of Containers
01	1. TK23-Stockpile-3	0	0	–	4/10/12	1207		X	X															X			X	X	3
	2.																												
	3.																												
	4.																												
	5.																												
	6.																												
	7.																												
	8.																												
	9.																												
	10.																												

-Request rush TAT-

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

No temp

Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
[signature]	(Y) N	4/10/12	1315			
Relinquished By:	On Ice? Y (N)	Date	Time	Received by: [signature]	4/11/12	8:30

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other: ______

Air Bill Number

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\FORMS\Chain Of Custody Form 2000 RLG Rev. 09/01/00

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Pace Analytical®	Document Name: Sample Condition Upon Receipt Form	Revised Date: 15Feb2012 Page 1 of 1
	Document Number: F-MN-L-213-rev.02	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Barr **Project #** 10187988

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other _____

Tracking #: 7982 5467 7652

Custody Seal on Cooler/Box Present: [ ] yes [X] no Seals Intact: [ ] yes [ ] no

Packing Material: [ ] Bubble Wrap [X] Bubble Bags [ ] None [ ] Other _____ Temp Blank (Yes) No

Thermometer Used (80344042) or 80512447 **Type of Ice:** (Wet) Blue None [ ] Samples on ice, cooling process has begun

Cooler Temperature 3.9 **Biological Tissue is Frozen:** Yes No

Temp should be above freezing to 6°C **Comments:**

Date and initials of person examining contents: 4/6/12 AMT

Chain of Custody Present:	[X]Yes [ ]No [ ]N/A	1.
Chain of Custody Filled Out:	[X]Yes [ ]No [ ]N/A	2.
Chain of Custody Relinquished:	[X]Yes [ ]No [ ]N/A	3.
Sampler Name & Signature on COC:	[ ]Yes [X]No [ ]N/A	4.
Samples Arrived within Hold Time:	[X]Yes [ ]No [ ]N/A	5.
Short Hold Time Analysis (<72hr):	[ ]Yes [X]No [ ]N/A	6.
Rush Turn Around Time Requested:	[X]Yes [ ]No [ ]N/A	7.
Sufficient Volume:	[X]Yes [ ]No [ ]N/A	8.
Correct Containers Used:	[X]Yes [ ]No [ ]N/A	9.
-Pace Containers Used:	[ ]Yes [X]No [ ]N/A	
Containers Intact:	[X]Yes [ ]No [ ]N/A	10.
Filtered volume received for Dissolved tests	[ ]Yes [ ]No [X]N/A	11.
Sample Labels match COC:	[X]Yes [ ]No [ ]N/A	12.
-Includes date/time/ID/Analysis Matrix: SL		
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	[ ]Yes [ ]No [X]N/A	13. [ ] HNO3 [ ] H2SO4 [ ] NaOH [ ] HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4, HCL<2; NaOH >12)	[ ]Yes [ ]No [X]N/A	
Exceptions: VOA,Coliform, TOC, Oil and Grease, WI-DRO (water)	[ ]Yes [X]No	Initial when completed / Lot # of added preservative
Headspace in VOA Vials (>6mm):	[ ]Yes [ ]No [X]N/A	14.
Trip Blank Present:	[ ]Yes [ ]No [X]N/A	15.
Trip Blank Custody Seals Present	[ ]Yes [ ]No [X]N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** 4/10/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

SKB LOQUET

REPORT NAME: **Tons Each Load By WSID**
DESCRIPTION: **Tonnage for EACH LOAD, grouped by customer**
DATE RANGE: **01/01/2012 to 06/24/2013**
PRINTED ON (DATE): **Monday, June 24, 2013**

ENBS1
Enbridge Pipelines Limited Partnership,
2800 East 21st St
Superior WI 54880

LOAD #	MANIFEST	ARRIVED	WASTE STREAM	WASTE NAME	CELL	SPOT	LIFT	TONS
1133 (A)	3814	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	14.37
1139 (A)	3813	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	16.15
1140 (A)	3811	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	15.67
1144 (A)	3812	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	17.23
1153 (A)	3810	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	16.88
1160 (A)	3461	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	15.49
1161 (A)	3460	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	17.22
1162 (A)	3470	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	17.19
1164 (A)	3465	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	15.73
1165 (A)	3462	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	16.64
1166 (A)	3469	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	16.02
1170 (A)	3468	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	17.96
1173 (A)	4560	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	19.00
1176 (A)	3478	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	19.00
1177 (A)	3471	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	15.88
1178 (A)	3477	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	16.32
1179 (A)	3482	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	15.85
1181 (A)	3476	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	17.52
1182 (A)	3472	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	17.23
1183 (A)	3473	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	18.07
1184 (A)	3474	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	19.22
1185 (A)	3479	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	13.20
1186 (A)	3481	4/18/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S38	1170	10.99
1187 (A)	3480	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	10.40
1188 (A)	3475	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	9.43
1193 (A)	3466	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	10.53
1194 (A)	3467	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	12.25
1195 (A)	4641	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	11.62
1196 (A)	4642	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	13.44
1212 (A)	4643	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	16.39
1213 (A)	4644	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	15.76
1217 (A)	4645	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	13.06
1218 (A)	4647	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	13.32
1219 (A)	4646	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	9.68
1227 (A)	4649	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	13.07
1230 (A)	4648	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	15.87
1232 (A)	4678	4/19/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S37	1170	13.73
1272 (A)	4674	4/20/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S39	1170	12.59
1283 (A)	4675	4/20/2012	CL12-0023	Crude Oil Impacted Soil-Tank 23	1A	S39	1170	10.31
8172 (A)	4662	3/1/2013	CL12-0023	Crude Oil Impacted Soil-Tank 23	2A	Z46	1160	0.89
				Total # of Loads: 40			**Total Tons:**	**581.17**

Grand Total (Tons): 581.17
Grand Total (Loads): 40

Attachment C.3

NR 720.19 analysis

See Table A.2 for site specific RCLs and EPA Soil Screening Level Model Calculations and results

Table A.2
Soil Analytical Data Summary
Tank 23 Pre-remedial Soil Analytical Tables
Enbridge Terminal - Superior, Wisconsin
Units, mg/kg (unless otherwise noted)
All samples were collected above the all-time low water table.

		Chemical Name	Moisture	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene	Naphthalene
	Effective Date	**Exceedance Key**															
Site Specific Groundwater RCLs		**Bold**				196.7442		**0.47**	**0.48**			**0.0725**		44.4089	7.4074		0.3294
Site Specific Industrial Direct Contact RCLs	05/01/2012	*Italic*		33000	487	100000	2.11	*0.211*	2.11		21.1	211	0.211	22000	22000	2.11	26
Location	**Sample Date**	**Depth (ft)**															
TK23-Floor Repair-1	1/31/2013		3.8 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-HIS-B1	4/3/2012	2.2	25.3 %	0.0576	< 0.0134	0.0987	0.302	***0.525***	**0.662**	0.148	0.267	**0.327**	0.0566	0.439	0.0800	0.158	0.0290
TK23-HIS-S1	4/3/2012	0.5	8.2 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-01	3/26/2013	6 - 7	24.1 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-02	3/26/2013	6 - 7	28.2 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-03	3/26/2013	5 - 6	25.1 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-03	3/26/2013	9 - 10	22.8 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-04	3/26/2013	6 - 7	25.1 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-05	3/26/2013	6 - 7	26.2 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-06	3/26/2013	5 - 6	23.6 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-07	3/26/2013	6 - 7	28.6 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-08	3/26/2013	5 - 6	24.4 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TK23-SB-09	3/26/2013	5 - 6	25.1 %	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TR - Based on 1,2,4-Trimethylbenzene and
1,3,5-Trimethylbenzene combined.

XYL - Based on Xylenes (m-, o-, p- combined).

*Estimated value, QA/QC criteria not met.

-- Not analyzed/Not available.

Table A.2
Soil Analytical Data Summary
Tank 23 Pre-remedial Soil Analytical Tables
Enbridge Terminal - Superior, Wisconsin
Units, mg/kg (unless otherwise noted)
All samples were collected above the all-time low water table.

		Chemical Name	Phenanthrene	Pyrene	Methyl tertiary butyl ether (MTBE)	1,2,4-Trimethyl benzene	1,3,5-Trimethyl benzene	Benzene	Diesel Range Organics	Ethyl benzene	Gasoline Range Organics	Toluene	Xylene, total	Exceedance Count	Hazard Quotient	Cumulative Cancer Risk	Pass or Fail
	Effective Date	Exceedance Key															
Site Specific Groundwater RCLs		**Bold**		27.2362	0.0135	**1.3793 TR**	**1.3793 TR**	**0.0051**		0.785		0.5536	**1.97 XYL**				
Site Specific Industrial Direct Contact RCLs	05/01/2012	*Italic*	115	16500	293	219	182	7.41		37		818	258	*0*	1.0	0.00001	*Pass*
Location	**Sample Date**	**Depth (ft)**															
TK23-Floor Repair-1	1/31/2013		--	--	< 0.0536	**9.94**	**7.81**	< 0.0214	7130	0.141	--	< 0.0536	**2.17**	0	0.0277	6.9E-09	Pass
TK23-HIS-B1	4/3/2012	2.2	0.324	0.463	--	0.66 *	0.30 *	**0.16** *	187	0.24 *	--	< 0.13 *	0.69 *	*1*	0.0023	3.3E-06	*Fail*
TK23-HIS-S1	4/3/2012	0.5	--	--	--	< 0.052	< 0.052	< 0.052	219	< 0.052	--	< 0.052	< 0.16	0	0.0003	8.4E-09	Pass
TK23-SB-01	3/26/2013	6 - 7	--	--	--	< 0.064	< 0.064	< 0.064	< 11.8	< 0.064	< 6.4	< 0.064	< 0.19	0	0.0003	1.0E-08	Pass
TK23-SB-02	3/26/2013	6 - 7	--	--	--	< 0.070	< 0.070	< 0.070	< 12.7	< 0.070	< 7.0	< 0.070	< 0.21	0	0.0004	1.1E-08	Pass
TK23-SB-03	3/26/2013	5 - 6	--	--	--	< 0.066	< 0.066	< 0.066	< 13.0	< 0.066	< 6.6	< 0.066	0.22	0	0.0003	1.1E-08	Pass
TK23-SB-03	3/26/2013	9 - 10	--	--	--	0.12	< 0.063	< 0.063	< 11.6	< 0.063	< 6.3	< 0.063	< 0.19	0	0.0005	1.0E-08	Pass
TK23-SB-04	3/26/2013	6 - 7	--	--	--	< 0.067	< 0.067	< 0.067	< 13.1	< 0.067	< 6.7	< 0.067	< 0.20	0	0.0003	1.1E-08	Pass
TK23-SB-05	3/26/2013	6 - 7	--	--	--	< 0.067	< 0.067	< 0.067	< 12.0	< 0.067	< 6.7	< 0.067	< 0.20	0	0.0003	1.1E-08	Pass
TK23-SB-06	3/26/2013	5 - 6	--	--	--	< 0.067	< 0.067	< 0.067	< 12.1	< 0.067	< 6.7	< 0.067	< 0.20	0	0.0003	1.1E-08	Pass
TK23-SB-07	3/26/2013	6 - 7	--	--	--	< 0.070	< 0.070	< 0.070	< 14.1	< 0.070	< 7.0	< 0.070	< 0.21	0	0.0004	1.1E-08	Pass
TK23-SB-08	3/26/2013	5 - 6	--	--	--	< 0.065	< 0.065	< 0.065	< 12.6	< 0.065	< 6.5	< 0.065	< 0.20	0	0.0003	1.1E-08	Pass
TK23-SB-09	3/26/2013	5 - 6	--	--	--	< 0.067	< 0.067	< 0.067	< 13.2	< 0.067	< 6.7	< 0.067	< 0.20	0	0.0003	1.1E-08	Pass

TR - Based on 1,2,4-Trimethylbenzene and 1,3,5-Trimethylbenzene combined.

XYL - Based on Xylenes (m-, o-, p- combined).

*Estimated value, QA/QC criteria not met.

-- Not analyzed/Not available.

Attachment C.4

Construction Documentation

Not applicable - Remedial construction was not involved in this project

Attachment C.5

Decommissioning of Remedial Systems

Not applicable - No remedial systems were involved in this project

Attachment C.6

Tank 23 Site Photos:

Tank 23 Road Construction

Photo 1: Ring road construction near western manway. April 3, 2012.

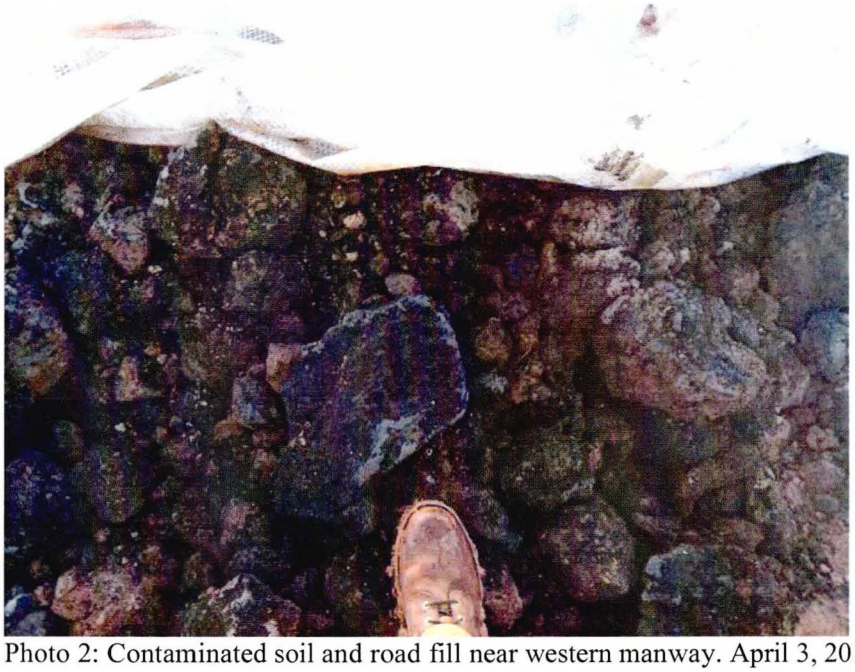


Photo 2: Contaminated soil and road fill near western manway. April 3, 2012.

Photo 3: Contaminated soil near northern D-door. April 9, 2012.

Photo 4: Final northern D-door excavation. April 9, 2012.

Photo 5: Contaminated soil left in place near northeastern mixer excavation. April 9, 2012.

Photo 6: Contaminated soil following cathodic line near northeastern mixer excavation. April 9, 2012.

Tank 23 Floor Cut-out

Photo 7: Tank 23 bottom cut-out. Petroleum contaminated fill sediment with surficial discoloration (darker coloration) shown. January 31, 2013

Photo 8: Close-up of petroleum contaminated sediment with dark surficial staining. January 31, 2013

Attachment D – Maintenance Plans

D.1 Location Maps

D.2 Brief Descriptions

D.3 Description of Maintenance action(s)

D.4 Inspection Logs

D.5 Contact Information

Not applicable - There is no planned Tank 23 site maintenance in relation to the contaminated soil

Attachment E

Monitoring Well Information

Not applicable - Monitoring wells were not involved in this project

Attachment F

Notifications to Owners of Impacted Properties

Not applicable - Enbridge owned the source property, contamination did not migrate onto another property, and monitoring wells were not involved in this project

Attachment G.1.

Deeds

(1) Enbridge Superior Terminal Deed

(2) Not applicable - Notification of off-source properties was not required

DEED

VOL 230 PAGE 89

409027

THIS INDENTURE, MADE BY INTERSTATE OIL PIPE LINE COMPANY, a Delaware corporation, hereby quitclaims to the LAKEHEAD PIPE LINE COMPANY, INC., a Delaware corporation duly authorized to do business in the State of Wisconsin, Grantee, for the sum of One Dollar ($1.00) and other good and valuable considerations, the receipt of which is hereby acknowledged, the following described real estate situated in Douglas County, State of Wisconsin, to-wit:

A parcel of land in the City of Superior, contained in the plat of Southwestern Division, in the Townsite of Superior, particularly described as follows:
Commencing at the center of Section Thirty-six (36) in Township Forty-nine (49) North of Range Fourteen (14) West; thence Westerly Thirty-three (33.0) feet on the East-West centerline of Section Thirty-six (36) which is the point of beginning; thence North a distance of One Thousand One Hundred Fifty-nine and 35/100 (1159.35) feet; thence Southwesterly at an angle of Forty-eight degrees Thirty-six minutes (48°36') from South to West a distance of One Thousand Seven Hundred Sixty and 55/100 (1760.55) feet; thence Easterly at an angle of Eighty-nine degrees Forty-Seven and one-half minutes (89°47½') from North to East a distance of One Thousand Three Hundred Twenty and 61/100 (1320.61) feet to the point of beginning.

All of Block 13
subject to the easement granted the Northern Pacific railroad Co. for a right of way for its railroad on Newton Ave.
All of Block 14
Southeast ¼ Block 15
Northeast ¼ Block 15
West ½ Block 15
Southwest ¼ Block 16
North ½ Block 16
Southeast ¼ Block 16
North ½ Block 17
Southwest ¼ Block 17
Southeast ¼ Block 17
All of Block 18
All of Block 19
All of Fr. Block 19
All of Block 20
All of Block 21
All of Block 22
All of Block 23
West ½ Block 24
East ½ Block 24
North ½ Block 25
Southeast ¼ Block 25
All of Block 26
That part lying East of the East line of Wisconsin Central Railway Company's right of way of Block 27

That part lying East of the East line of Wisconsin Central Railway Company's right of way of Block 28
all on West Thirty-first Street

Northwest ¼ Block 13
subject to the easement granted the Northern Pacific Railroad Co. for a right of way for its railroad on Newton Ave.
South ½ Block 13
subject to the easement granted the Northern Pacific Railroad Co. for a right of way for its railroad on Newton Ave.
Northeast ¼ except r/w Block 13
All, except r/w Fr. Block 14
All of Block 15
North ½ Block 16
South ½ Block 16
All of Block 17
Southeast ¼ Block 18
North ½ Block 18
Southwest ¼ Block 18
All of Block 19
All of Block 20
All of Block 21
All of Block 22
That part of the South ½ lying East of the East line of Wisconsin Central Railway Company's right of way of Block 23
North ½ Block 23
That part lying East of the East line of Wisconsin Central Railway Company's right of way of Block 24
Northeast ¼, E'ly. of E'ly. line of W. C. Ry. r/w Block 25
all on West Thirty-third Street

South ½ Block 13
subject to the easement granted the Northern Pacific Railroad Co. for a right of way for its railroad on Newton Ave.
All of Block 14
subject to the easement granted the Northern Pacific Railroad Co. for a right of way for its railroad on Newton Ave.
All of Block 15
All of Block 16
All of Block 17
Northwest ¼ Block 18
Northeast ¼ Block 18
South ½ Block 18
East ½ Block 19
West ½ Block 19
That part of the North ½ lying East of the East line of Wisconsin Central Railway Company's right of way of Block 20
That part of the Southwest ¼ lying East of the East line of Wisconsin Central Railway Company's right of way of Block 20

Southeast ¼	Block 20
That part lying East of the East line of Wisconsin Central Railway Company's right of way of	Block 21
all on West Thirty-fifth Street	
All of	Block 13
subject to the easement granted the Northern Pacific Railroad Co. for a right of way for its railroad on Newton Ave.	
All of	Block 14
North ½	Block 15
West ½ of the Southwest ¼	Block 15
East ½ of the Southwest ¼	Block 15
All of	Block 16
Southeast ¼	Block 17
North ½	Block 17
Southwest ¼ except r/w	Block 17
That part lying East of the East line of Wisconsin Central Railway Company's right of way of	Block 18
That part lying East of the East line of Wisconsin Central Railway Company's right of way of	Block 19
all on West Thirty-seventh Street	
All of	Block 13
subject to the easement granted the Northern Pacific Railroad Co. for a right of way for its railroad on Newton Ave.	
That part of the West ½ lying East of the East line of Wisconsin Central Railway Company's right of way of	Block 14
That part lying East of the East line of Wisconsin Central Railway Company's right of way of	Block 15
all on West Thirty-ninth Street	
That part lying East of the East line of Wisconsin Central Railway Company's right of way, subject to the easement granted the Northern Pacific Railroad Company for a right of way for its railroad on Newton Avenue of	Block 13
on West Forty-first Street	
All of	Block 3
All of	Block 4
all on East Nineteenth Street	
All of	Block 3
Northeast ¼	Block 5
Northwest ¼	Block 4
Southeast ¼	Block 4
all on East Twenty-first Street	

-3-

All of Fr. Block 3
on East Twenty-third Street

All of Fr. Block 3
on East Twenty-fourth Street

all the foregoing in the Townsite of Superior;

Lots Thirty-three (33), Thirty-five (35), Thirty-seven (37), Thirty-nine (39), Forty-one (41), Forty-three (43), Forty-five (45) and Forty-Seven (47) on East Twenty-second Street

Lots Thirty-four (34), Thirty-six (36), Thirty-Eight (38), Forty (40), Forty-two (42), Forty-four (44), Forty-six (46), Forty-eight (48), Fifty (50), Fifty-two (52), Fifty-four (54), Fifty-six (56), Fifty-eight (58), Sixty (60), Sixty-two (62) and Sixty-four (64) on East Twenty-third Street

All in Sub-division of Block Four (4), East Twenty-third Street

according to the recorded plat or plats thereof on file and in the office of the Register of Deeds in and for Douglas County, Wisconsin.

The following described real estate situated in Douglas County, Wisconsin:

South Half (S½) Section Thirty-six (36) Township Forty-nine (49) North of Range Fourteen (14) West, except the following described tracts of land:

(a) Government Lot One (1)

(b) A strip of land Four Hundred Feet (400') wide through the Northwest Quarter Southwest Quarter (NW¼SW¼) lying Southeasterly of and adjacent to the present Northern Pacific Railway Company's right of Way

(c) A triangular piece lying Northwesterly of Northern Pacific Railway Company's right of way, 85D96 and 109D526

(d) A strip of land Three Hundred Feet (300') in width North and South from the South line of said Section and further extending from the West line to the East line of said Southwest Quarter (SW¼)

(e) A tract of land described as follows:

Beginning at the Southwest corner of the Southeast Quarter (SE¼) of Section Thirty-six (36), Township Forty-nine (49) North of Range Fourteen (14) West, and proceeding North along the Quarter Section line a distance of One Thousand Four Hundred Eighty-two and 04/100 (1482.04) feet, thence at an angle of

-4-

Ninety Degrees Three and one-half minutes (90°3½') to the right and proceeding for a distance of One Thousand Six Hundred Sixty (1660.) feet, thence turning at an angle of Forty-Six Degrees Ten Minutes Forty Seconds (46°10' 40") to the right, thence proceeding to the northerly bank of the Nemadji River as now situated, thence proceeding in a Westerly direction along the bank of the Nemadji River and following said bank to the South Section line of said Southeast Quarter (SE¼), thence proceeding westerly along the South section line to the point of beginning, said tract of land containing approximately Fifty-six and 7/10 (56.7) acres more or less

WITNESS the corporate name and seal of said Grantor hereunto affixed by authority of its Board of Directors on this 21st day of December, 1951.

[illegible] OIL PIPE LINE COMPANY,

By: [signature]
Its [illegible]
[illegible] L. Baker

IN THE PRESENCE OF:

[signature]
[illegible] Toler

[signature]
Frank R. Clark, Jr.

By: [signature]
Its Secretary
F. M. Hunter

* * *

STATE OF Louisiana)
) ss:
COUNTY OF Caddo)

ON THIS the 21st day of December, 1951, before me, the undersigned Notary Public in and for Caddo Parish, County, State of Louisiana, personally appeared [illegible] and F. M. Hunter, who respectively acknowledged themselves to be officers, to wit: President and [illegible] of [illegible] OIL PIPE LINE COMPANY, a corporation, the Grantor in the foregoing instrument, and that [illegible] officers being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of [illegible] corporation by themselves as such officers and affixing the corporate seal, with the authority of the Board of Directors [illegible] corporation.

IN WITNESS WHEREOF I have hereunto set my hand and official seal.

[signature]
Notary Public, [illegible] County
State of [illegible]
My Commission Expires [illegible]
[illegible] F. [illegible]

-2-

409027

OFFICE OF REGISTER OF DEEDS
DOUGLAS COUNTY, WISCONSIN
Received for record this 25
day of January A.D. 19 62
at 9:05 o'clock A M. and
recorded in Vol. 230
of Deeds on page 94
[illegible] Register
Deputy

QUIT - CLAIM DEED

INTERSTATE OIL PIPE LINE COMPANY

-to-

LAKEHEAD PIPE LINE COMPANY, INC.

[illegible]

LAKEHEAD PIPE LINE COMPANY, INC.

Superior Terminal

Those areas of Section 35 and 36, Township 49 North, Range 14 West, and Section 31, Township 49 North, Range 13 West, all in Douglass County, Wisconsin, described as follows:

Parcel No. 1

Commencing at the Northeast corner of Section 35; thence Southerly along the East boundary of said Section to the centerline of West 30th Street to the point of beginning; thence Southeasterly along the center of West 30th Street to the North boundary of 25th Avenue East; thence Southwesterly along the Northerly boundary of 25th Avenue East to the East-West centerline of Section 36; thence Westerly along the East-West centerline of Section 36, to the East boundary of Section 35; thence Southerly along the East boundary of Section 35 to the North boundary of 25th Avenue East; thence Southwesterly along the North boundary of 25th Avenue East to the East right-of-way line of the Northern Pacific Railroad as presently installed; thence Northerly along the East right-of-way line of the Northern Pacific Railroad as presently installed to the center of West 30th Street thence Southeasterly along the center of West 30th Street to the point of beginning excepting all street and avenue easements contained therein and the following parcels: the SW 1/4 of Block 25 on West 31st Street; the SE 1/4 of Block 17 on West 35th Street; the E 1/2 of Block 16 on West 37th Street; all that portion of Block 13 on West 35th Street lying East and North of Hill Avenue.

Parcel No. 2 (Pipeline Maintenance Area)

Commencing at the Northeast corner of Section 36; thence Westerly along the North boundary of Section 36 to the North-South centerline of Section 36, also known as the centerline of Bardon Avenue; thence Southerly along the centerline of Bardon Avenue for a distance of approximately 1,440 feet to a point; said point being the point of beginning; thence Southerly along the centerline of Bardon Avenue along a bearing of S 0° 03' 35" E for a distance of 660.78 feet to a point; thence S 41° 27' 35" E for a distance of 545.66 feet to a point; thence N 48° 32' 25" E for a distance of 436.98 feet to the point of beginning; all begin in Section 36, Township 49 North, Range 14 West. Douglas County, State of Wisconsin.

SUPERIOR TERMINAL (continued)

Parcel No. 3

Commencing at the Northeast corner of Section 36; thence Southerly along the East boundary of Section 36 to the centerline of East 18th Street; thence Southeasterly along the centerline of East 18th Street to the North boundary of 28th Avenue East; thence Southwesterly along the North boundary of 28th Avenue East to its junction with the Easterly boundary of East 18th Street being the point of beginning; thence 316.35 feet more or less Southwesterly along the North boundary of 28th Avenue East to a point 250 feet perpendicular to the Northern Pacific Railroad as presently installed; thence 1602.57 feet more or less and 34° 10 feet right more or less and 250 feet parallel to the Northern Pacific Railroad as presently installed to a point on the South boundary of 26th Avenue East; thence Southwesterly along the South boundary of 26th Avenue East, to a point of the East boundary of Bardon Avenue; thence Southerly along the East boundary of Bardon Avenue to a point 1168.79 feet more or less South of the East-West centerline of Section 36; thence 1627.00 feet 89° 56' 30" left; thence 188.00 feet 46° 11' right to a point, more or less on the North boundary of the Nemadji River; thence Easterly along the North boundary of the Nemadji River to a point on the East boundary of Section 36; thence Northerly 670.37 feet more or less along the East boundary of Section 36, to the North boundary of 33rd Avenue East; thence Northeasterly along the North boundary of 33rd Avenue East to the West boundary of East 18th Street; thence Northwesterly along the West boundary of East 18th Street to the center of 31st Avenue East; thence continuing along the same line but known as West 18th Street to the point of beginning. This parcel contains 255.04 acres, more or less. Excepting the portion of East 22nd Street bounded on the North by Block 3 of East 21st Street, on the South by Block 4 of East 23rd Street, on the East by the North boundary of 33rd Avenue East and on the West by a line 200 feet perpendicular and parallel to the North boundary of 33rd Avenue East.

Parcel No. 4

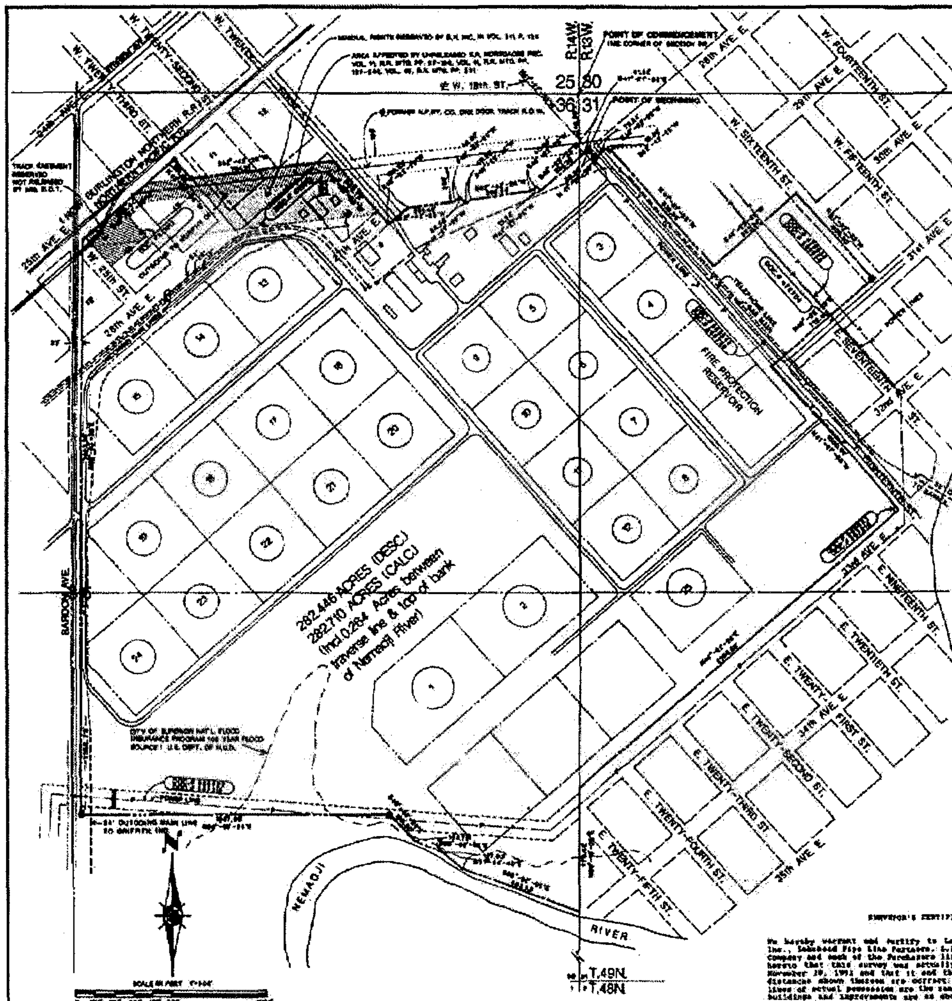
Block 14 on West 21st Street, Townsite of Superior, Douglas County, Wisconsin, containing 2.35 acres more or less.

Parcel No. 5

The E ½ of the SW ¼ and the SE ¼ of Block 6 on West 17th Street; the SW ¼ and the E ½ of the SE ¼ of Block 4 on West 17th Street; the S ½ of Block 2 on West 17th Street; the SW ¼ and W ½ of the SE ¼ of Block 1 on East 17th Street, Townsite of Superior, Douglas County, Wisconsin, containing a total of 4.10 acres more or less.

Attachment G.*2.*

Certified Survey Map



SURVEYOR'S CERTIFICATION

We hereby warrant and certify to Lakehead Pipe Line Company, Inc., Lakehead Pipe Line Partners, L.P., Chicago Title Insurance Company and each of the Purchasers listed in Schedule A attached hereto that this survey was actually made upon the ground on November [illegible], 1991 and that it and the information, courses and distances shown thereon are correct; that the title lines and lines of actual possession are the same; that the location of the buildings and improvements are as shown and all are within the boundary lines of the property; that there are no easements or encroachments affecting this property appearing from a careful, physical inspection of the same, other than those shown and depicted thereon; that ingress and egress to the property are provided by West Twenty-first Street, the same being opened and dedicated public rights of way maintained by the City of Superior; and that the parcels described hereon do not lie within flood hazard areas in accordance with the documents entitled "Department of Housing and Urban Development, Federal Insurance Administration - Special Flood Hazard Area Maps," except as set forth therein.

Dennis A. Martens, [illegible] Wisconsin 12/10/91

John P. Bergson, [illegible] Minnesota 12/10/91

SURVEYED PREMISES

Those parts of the Northwest Quarter (NW-1/4) and the North half of the Southwest Quarter (N-1/2 of SW-1/4) of Section Thirty-one (31), Township Forty-nine (49) North, Range Thirteen (13) West and the Northeast Quarter (NE-1/4) and the Northeast Quarter of the Southeast Quarter (NE-1/4 of SE-1/4) and Government Lot Three (3), of Section Thirty Six (36), Township Forty-nine (49) North, Range Fourteen (14) West, in Douglas County, Wisconsin;

and

of all or parts of the platted Lots and Blocks [illegible] which were vacated by a Resolution of the Council of the City of Superior, Wisconsin, dated May [illegible], 1991 and recorded in Volume [illegible] of Agreements, page [illegible] which are set forth in Part II hereof;

and

of the vacated streets, avenues and alleys abutting said Platted Lots and Blocks and vacated Lots and Blocks, contained within the following description set forth as Part I, to-wit:

Part I

Commencing at the Northeast corner of said Section 31; thence Southerly along the East boundary of Section 31 a distance of [illegible] feet to the center line of vacated West 19th Street; [illegible]

Part II

[illegible]

[illegible]

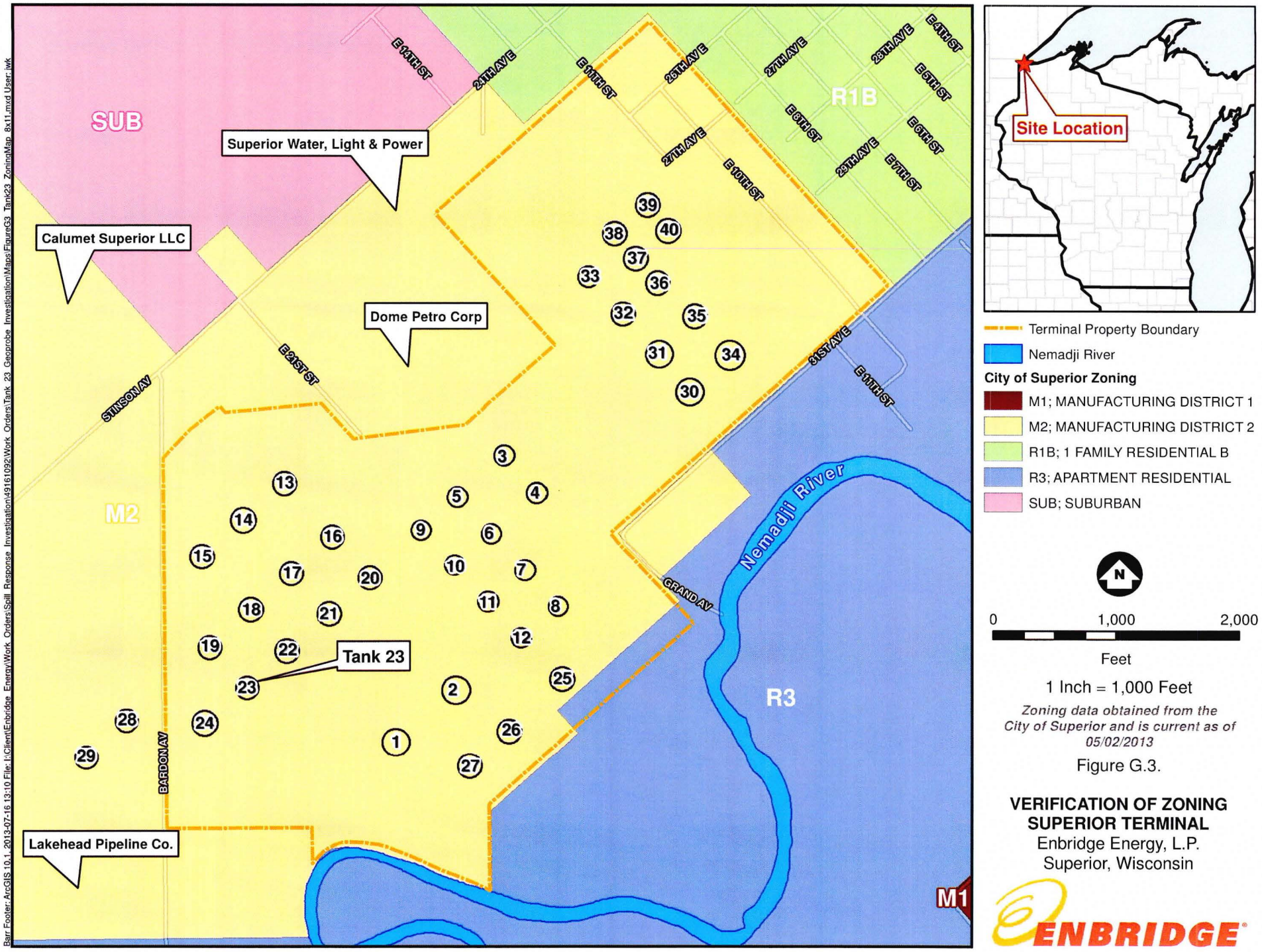


Figure G.3.

VERIFICATION OF ZONING
SUPERIOR TERMINAL
Enbridge Energy, L.P.
Superior, Wisconsin

ENBRIDGE

Attachment G.*4.*

Signed Statement

Enbridge Pipelines (Lakehead) L.L.C.
Environment Department
1320 Grand Avenue
Superior, WI 54880
Tel 715 394 1400
Fax 715 394 1500

www.enbridgepartners.com

Shane Yokom	Manager, Environment Operations
Joseph Peterson	Supervisor, Region Operations
Jim Snider	Environmental Specialist
Cheryl Urie	Environmental Specialist
Rhonda O'Leary	Sr. Air Compliance Specialist
James Anklam	Sr. Environmental Analyst
Karl Beaster	Environmental Analyst II
Stacey Frerich	Environmental Analyst II
Derek Senn	Environmental Analyst II
Kelli Nelson	Environmental Analyst
Bryan Sederberg	Environmental Analyst
Alex Smith	Environmental Analyst
Greg St. Onge	ER Preparedness Coordinator
Julie O'Brien	Environmental Assistant

August 6, 2013

Mr. John Sager
Wisconsin Department of Natural Resources
107 Sutliff Avenue
Rhinelander WI 54501

Re: Enbridge Energy, Limited Partnership
Case Closure Request
Tank 23, Superior Terminal
Superior, Wisconsin
BRTTS # 02-16-558989

Dear Mr. Sager:

The attached surveyed drawing and legal description accurately describes the Superior Terminal property which includes the Tank 23 leak site.

Sincerely,
Enbridge Energy

Karl F. Beaster, P.G.
Environmental Analyst

Enclosure

cc: Ryan Erickson, Barr Engineering

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
Superior Service Center
1701 N. 4th Street
Superior WI 54880

COPY

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
Toll Free 1-888-936-7463
TTY Access via relay - 711

WISCONSIN
DEPT. OF NATURAL RESOURCES

December 11, 2012

Karl Beaster
Enbridge Energy
1320 Grand Ave
Superior WI 54880

Subject: Reported Contamination at Enbridge Energy – Tank 23, Superior, WI
WDNR BRRTS Activity # 02-16-558989
WDNR FID # 816010580

Dear Mr. Beaster:

On June 19, 2012, Enbridge Energy notified the Wisconsin Department of Natural Resources ("WDNR") that crude oil had been detected at the site described above.

Based on the information that has been submitted to the WDNR regarding this site, we believe you are responsible for investigating and restoring the environment at the above-described site under Section 292.11, Wisconsin Statutes, known as the hazardous substances spills law.

This letter describes the legal responsibilities of a person who is responsible under section 292.11, Wis. Stats., explains what you need to do to investigate and clean up the contamination.

Legal Responsibilities:
Your legal responsibilities are defined both in statute and in administrative codes. The hazardous substances spill law, Section 292.11 (3) Wisconsin Statutes, states:

- RESPONSIBILITY. A person who possesses or controls a hazardous substance which is discharged or who causes the discharge of a hazardous substance shall take the actions necessary to restore the environment to the extent practicable and minimize the harmful effects from the discharge to the air, lands, or waters of the state.

Wisconsin Administrative Code chapters NR 700 through NR 749 establish requirements for emergency and interim actions, public information, site investigations, design and operation of remedial action systems, and case closure. Wisconsin Administrative Code chapter NR 140 establishes groundwater standards for contaminants that reach groundwater.

Steps to Take:
The longer contamination is left in the environment, the farther it can spread and the more it may cost to clean up. Quick action may lessen damage to your property and neighboring properties and reduce your

costs in investigating and cleaning up the contamination. To ensure that your cleanup complies with Wisconsin's laws and administrative codes, you should hire a professional environmental consultant who understands what needs to be done. These are the first steps to take:

1. Within the next **30 days,** by January 15, 2013, you should submit written verification (such as a letter from the consultant) that you have hired an environmental consultant. If you do not take action within this time frame, the WDNR may initiate enforcement action against you.

2. Within the next **60 days,** by February 15, 2013, your consultant should submit a work plan and schedule for the investigation. The consultant must comply with the requirements in the NR 700 Wis. Adm. Code rule series and should adhere to current WDNR technical guidance documents.

In addition, within 30 days of completion of the site investigation, your consultant should submit a Site Investigation Report to the WDNR or other agency with administrative authority.

Sites where discharges to the environment have been reported are entered into the Bureau for Remediation and Redevelopment Tracking System ("BRRTS"), a version of which appears on the WDNR's internet site. You may view the information related to your site at any time (http://**dnr.wi.gov/botw**/SetUpBasicSearchForm.do) and use the feedback system to alert us to any errors in the data.

If you want a formal written response from the department on a specific submittal, please be aware that a review fee is required in accordance with ch. NR 749, Wis. Adm. Code. If a fee is not submitted with your reports, you should proceed under the advice of your consultant to complete the site investigation and cleanup to maintain your compliance with the spills law and chapters NR 700 through NR 749. **Do not delay the investigation of your site by waiting for an agency response.** We have provided detailed technical guidance to environmental consultants. Your consultant is expected to know our technical procedures and administrative rules and should be able to answer your questions on meeting cleanup requirements.

All correspondence regarding this site should be sent to me at the Superior office. Unless otherwise requested, please send only one copy of plans and reports. In addition to the paper copy, an electronic copy may also be submitted. To speed processing, correspondence should reference the BRRTS and FID numbers (if assigned) shown at the top of this letter.

Site Investigation and Vapor Pathway Analysis

As you develop the site investigation work plan, we want to remind you to include an assessment of the vapor intrusion pathway. Chapter NR 716, Wisconsin Administrative Code outlines the requirements for investigation of contamination in the environment. Specifically, s. NR 716.11(3)(a) requires that the field investigation determine the "nature, degree and extent, both areal and vertical, of the hazardous substances or environmental pollution in all affected media". In addition, section NR 716.11(5) specifies that the field investigation include an evaluation of the "pathways for migration of the contamination, including drainage improvements, utility corridors, bedrock and permeable material or soil along which vapors, free product or contaminated water may flow".

You will need to include documentation with the Site Investigation Report that explains how the assessment was done. If the pathway is being ruled out, then the report needs to provide the appropriate justification for reaching this conclusion. If the pathway cannot be ruled out, then investigation and, if appropriate, remedial action must be taken to address the risk presented prior to submitting the site for closure. The WDNR has developed guidance to help responsible parties and their consultants comply with the requirements described above. The guidance includes a detailed explanation of how to assess the vapor intrusion pathway and provides criteria which identify when an investigation is necessary. The guidance is available at: http://dnr.wi.gov/files/PDF/pubs/rr/RR800.pdf.

Additional Information for Site Owners:
We encourage you to visit our website at http://dnr.wi.gov/topic/Brownfields/, where you can find information on selecting a consultant, financial assistance and understanding the cleanup process. You will also find information there about liability clarification letters, post-cleanup liability and more.

If you have questions, contact me at 715-392-3126 or via email at erin.endsley@wisconsin.gov for more information or visit the RR web site at the address above.

Thank you for your cooperation.

Sincerely,

Erin Endsley

Erin Endsley
Hydrogeologist
Remediation & Redevelopment Program

cc: Hans Wronka, Barr Engineering

* need additional
Sampling around 17 door
+ mixer areas

02-16-558989 Accepted

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

RECEIVED
JUN 18 2012
DNR - SUPERIOR

Notification For Hazardous Substance Discharge (Non-Emergency Only)

Form 4400-225 (05/12) Page 1 of 2

Emergency Discharges / Spills should be reported via the 24-Hour Hotline: 1-800-943-0003

Notice: Hazardous substance discharges must be reported immediately according to s. 292.11 Wis. Stats. Non-emergency hazardous substance discharges may be reported by telefaxing or e-mailing a completed report to the Department, or calling or visiting a Department office in person. If you choose to notify the Department by telefax or by email, you should use this form to be sure that all necessary information is included. However, use of this form is not mandatory. Under s. 292.99, Wis. Stats., the penalty for violating the reporting requirements of ch. 292 Wis. Stats., shall be no less than $10 nor more than $5000 for each violation. Each day of continued violation is a separate offense. It is not the Department's intention to use any personally identifiable information from this form for any purpose other than program administration. However, information submitted on this form may also be made available to requesters under Wisconsin's Open Records Law (ss. 19.31 – 19.39, Wis. Stats.).

Confirmatory laboratory data should be included with this form, to assist the DNR in processing this Hazardous Substance Release Notification.

Complete this form. **TYPE or PRINT LEGIBLY.** NOTIFY appropriate DNR region (see next page) **IMMEDIATELY** upon discovery of a potential release from **(check one)**:

☐ Underground Petroleum Storage Tank System (additional information may be required for Item 6 below)
☐ Aboveground Petroleum Storage Tank System
☐ Dry Cleaner Facility
☒ Other - Describe: Enbridge Superior Terminal - Tank 23 Historically Contaminated Soil

ATTN DNR: **R & R Program Associate** Date DNR Notified: 05/31/2012

1. Discharge Reported By

Name	Firm	Phone No. (include area code)
Karl Beaster	Enbridge Energy	(715) 398-4754

Mailing Address	Email Address
1320 Grand Ave., Superior, WI 54880	karl.beaster@enbridge.com

2. Site Information

Name of site at which discharge occurred. Include local name of site/business, not responsible party name, unless a residence/vacant property. Enbridge Superior Terminal - Tank 23

Location: Include street address, not PO Box. If no street address, describe as precisely as possible, i.e., 1/4 mile NW of CTHs 60 & 123 on E side of CTH 60. 2800 East 21st Street, Superior, WI 54880

Municipality: (City, Village, Township) Specify municipality in which the site is located, not mailing address/city.
Superior

County:	Legal Description:	WTM:
Douglas	NW 1/4 SE 1/4 Sec 36 Tn 49N Range 14 ○ E ◉ W	X 362148 Y 692142

3. Responsible Party (RP) and/or RP Representative

Responsible Party Name: Business or owner name that is responsible for cleanup. If more than one, list all. Attach additional pages as necessary.

Enbridge Energy

☐ Reported in compliance with s. 292.11(2), Wis. Stats., by a local government exempt from liability under s. 292.11(9)(e), Wis. Stats. For more information see **http://dnr.wi.gov/org/aw/rr/lgu/liability.htm**.

Contact Person Name (if different)	Phone Number	Email Address
Karl Beaster	(715) 398-4757	karl.beaster@enbridge.com

Mailing Address	City	State	ZIP Code
1320 Grand Ave., Superior, WI 54880	Superior	WI	54880

Property owner if Different From RP: Business or owner name that is responsible for cleanup. If more than one, list all. Attach additional pages as necessary.

Contact Person Name (if different)	Phone Number	Email Address

Mailing Address	City	State	ZIP Code

(continued)

State of Wisconsin
Department of Natural Resources
dnr.wi.gov

Notification For Hazardous Substance Discharge (Non-Emergency Only)

4. Hazardous Substance Information

Identify hazardous substance discharged (check all that apply):

- ☒ VOC's
- ☐ PAH's
- ☐ Metals (specify): _____
  - ☐ Arsenic
  - ☐ Chromium
  - ☐ Cyanide
  - ☐ Lead
  - ☐ PCB's
- ☐ Diesel
- ☐ Fuel Oil
- ☐ Gasoline
- ☐ Hydraulic Oil
- ☐ Jet Fuel
- ☐ Mineral Oil
- ☐ Waste Oil
- ☐ Petroleum-Unknown Type
- ☐ PERC (Dry Cleaners)
- ☐ RCRA Hazardous Waste
- ☐ Leachate
- ☐ Fertilizer
- ☐ Pesticide/Herbicide/Insecticide(s)
- ☒ Other (specify): Crude oil
- ☐ Unknown

5. Impacts to the Environment Information

Enter "K" for known/confirmed or "P" for potential for all that apply.

- ___ Air Contamination
- ___ Co-Contamination (Petroleum & Non-Petroleum)
- ___ Contamination Within 1 Meter of Bedrock
- ___ Contaminated Private Well
- ___ Contaminated Public Well
- ___ Contamination in Fractured Bedrock
- ___ Sanitary Sewer Contamination
- ___ Contamination in Right of Way
- ___ Fire Explosion Threat
- K Free Product
- P Groundwater Contamination
- ___ Off-Site Contamination
- ___ Other (specify): _____
- K Soil Contamination
- ___ Storm Sewer Contamination
- ___ Surface Water Contamination
- ___ Within 100 ft of Private Well
- ___ Within 1000 ft of Public Well

Contamination was discovered as a result of:

☐ Tank closure assessment Date _____
☐ Site assessment Date _____
☒ Other - Describe: Tank road construction Date 04/18/2012

Lab results: ☐ Lab results will be faxed upon receipt ☒ Lab results are attached

Additional Comments: Include a brief description of immediate actions taken to halt the release and contain or cleanup hazardous substances that have been discharged.
Crude contaminated soil removed from the construction excavation was segregated from clean soil and handled according to WDNR regulations.

6. Federal Energy Act Requirements (Section 9002(d) of the Solid Waste Disposal Act (SWDA))

For all confirmed releases from UST's occurring after 9/30/2007 please provide the following information:

☐ Does not apply.

Source

- ☒ Tank
- ☐ Piping
- ☐ Dispenser
- ☐ Submersible Turbine Pump
- ☐ Delivery Problem
- ☐ Other (specify): _____

Cause

- ☐ Spill
- ☐ Overfill
- ☐ Corrosion
- ☐ Physical or Mechanical Damage
- ☐ Installation Problem
- ☒ Other (does not fit any of above)
- ☐ Unknown

Contact information to report non-emergency releases in DNR's five regions are as follows:

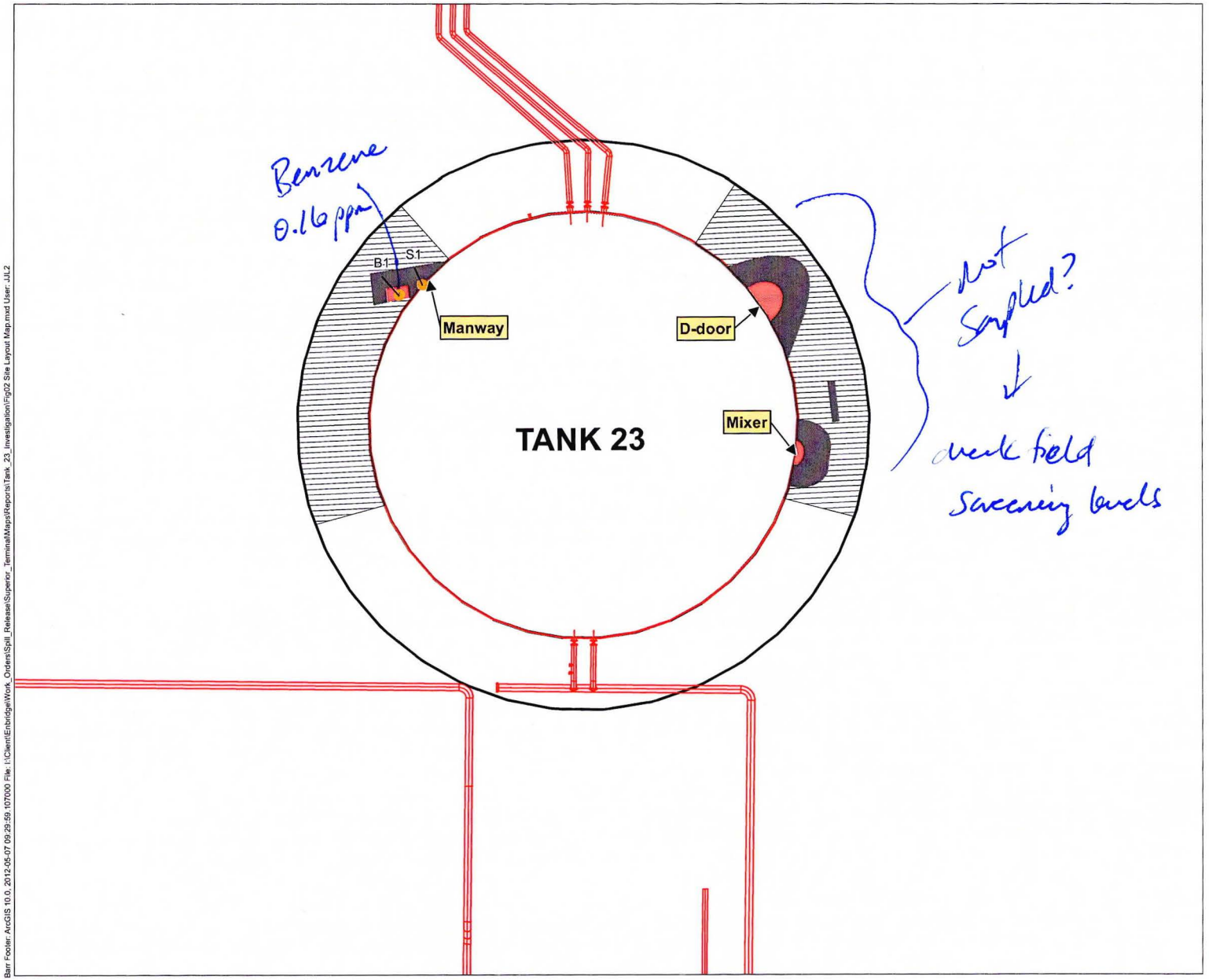
Northeast Region (FAX: 920-662-5197); Attention -- R&R Program Associate: DNRRRNER@wisconsin.gov
Brown, Calumet, Door, Fond du Lac **(except City of Waupun - see South Central Region)**, Green Lake, Kewaunee, Manitowoc, Marinette, Marquette, Menominee, Oconto, Outagamie, Shawano, Sheboygan, Waupaca, Waushara, Winnebago counties

Northern Region (FAX: 715-623-6773); Attention -- R&R Program Associate: DNRRRNOR@wisconsin.gov
Ashland, Barron, Bayfield, Burnett, Douglas, Forest, Florence, Iron, Langlade, Lincoln, Oneida, Polk, Price, Rusk, Sawyer, Taylor, Vilas, Washburn counties

South Central Region (FAX: 608-273-5610); Attention -- R&R Program Associate: DNRRRSCR@wisconsin.gov
Columbia, Dane, Dodge, Fond du Lac **(City of Waupun only)**, Grant, Green, Iowa, Jefferson, Lafayette, Richland, Rock, Sauk, Walworth counties

Southeast Region (FAX: 414-263-8550); Attention -- R&R Program Associate: DNRRRSER@wisconsin.gov
Kenosha, Milwaukee, Ozaukee, Racine, Washington, Waukesha counties

West Central Region (FAX: 715-839-6076); Attention -- R&R Program Associate: DNRRRWCR@wisconsin.gov
Adams, Buffalo, Chippewa, Clark, Crawford, Dunn, Eau Claire, Jackson, Juneau, LaCrosse, Marathon, Monroe, Pepin, Pierce, Portage, St. Croix, Trempealeau, Vernon, Wood counties



- Analytical Samples
- Field Screened Interval
- Impacted Soil - Left in Place
- Impacted Soil - Removed
- Road Boundary
- Terminal Property Boundary
- Terminal Pipeline Infrastructure

Feet
0 20 40 80

1 Inch = 40 Feet

Figure 2

Site Layout Map
Tank 23 Excavation Oversight
Enbridge Superior Terminal
Superior, Wisconsin

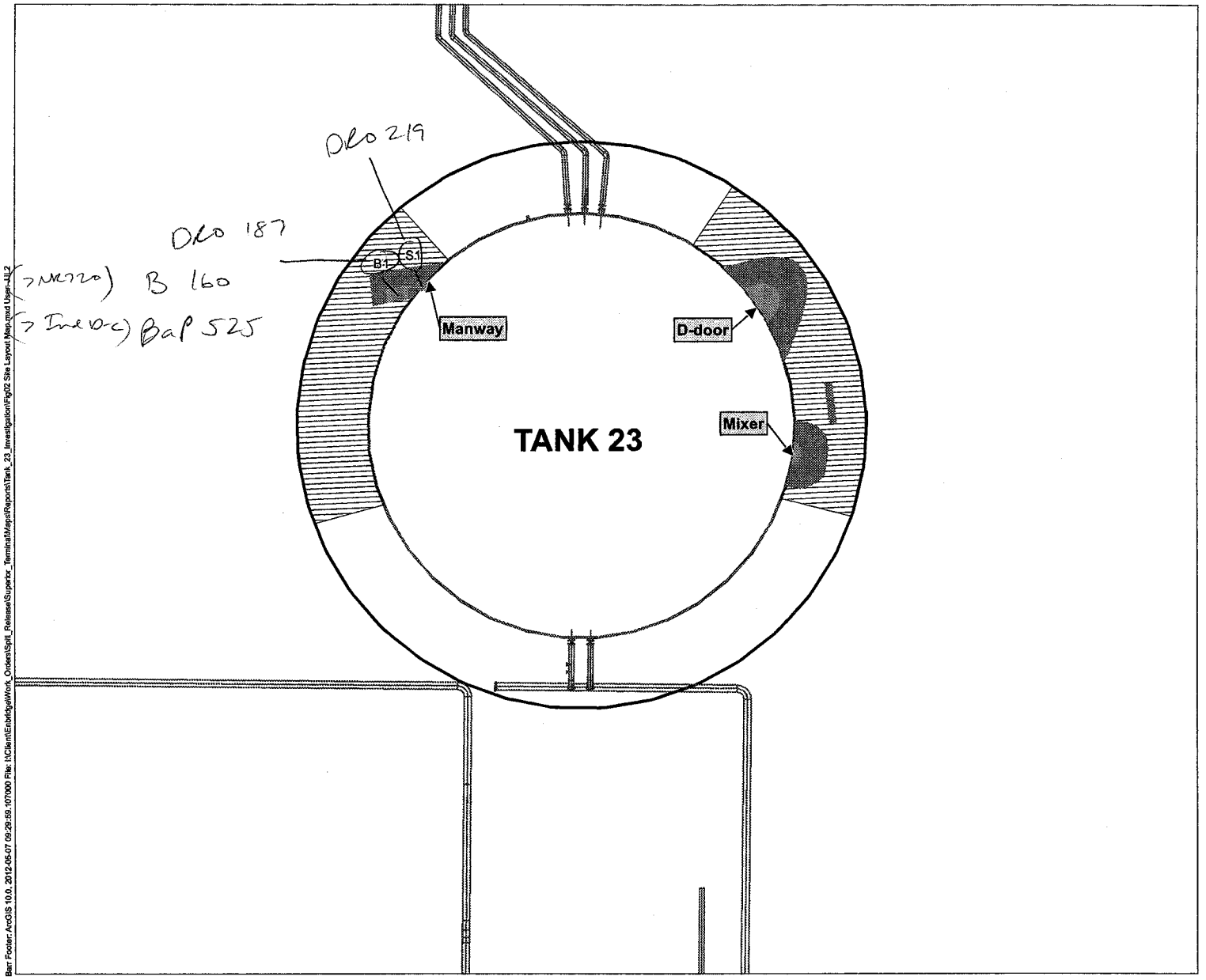
Imagery Source: LMIC 2009 Duluth Imagery.

ENBRIDGE

Table 1
Soil Analytical Data Summary
Tank 23 Excavation Oversight
(concentrations in mg/kg, unless noted otherwise)

					Sys Loc Code	**TK23-HIS-B1**	**TK23-HIS-S1**
					Sample Date	**4/3/2012**	**4/3/2012**
					Depth Interval	**2.2 ft**	**0.5 ft**
	Wisconsin Generic Residual Contaminant Levels NR 720.09	Wisconsin Industrial Residual Contaminant Levels	Wisconsin Soil Screening Levels for Ingestion (Carcinogenic)	Wisconsin Soil Screening Levels for Ingestion (Non-Carcinogenic)		
Effective Date	4/1/1997	4/1/1997				
Exceedance Key	**Bold**	*Italic*	No Exceed	No Exceed		
General Parameters						
Moisture, %					25.3	8.2
SVOCs						
Acenaphthene	38	60000			0.0576	--
Acenaphthylene	0.7	360			< 0.0134	--
Anthracene	3000	300000			0.0987	--
Benzo(a)anthracene	17	3.9			0.302	--
Benzo(a)pyrene	48	*0.39*			*0.525*	--
Benzo(b)fluoranthene	360	3.9			0.662	--
Benzo(g,h,i)perylene	6800	39			0.148	--
Benzo(k)fluoranthene	870	39			0.267	--
Chrysene	37	390			0.327	--
Dibenz(a,h)anthracene	38	0.39			0.0566	--
Fluoranthene	500	40000			0.439	--
Fluorene	100	40000			0.0800	--
Indeno(1,2,3-cd)pyrene	680	3.9			0.158	--
Naphthalene	0.4	110			0.0290	--
Phenanthrene	1.8	390			0.324	--
Pyrene	8700	30000			0.463	--
Total Petroleum Hydrocarbons						
1,2,4-Trimethylbenzene					0.66 *	< 0.052
1,3,5-Trimethylbenzene					0.30 *	< 0.052
Benzene	**0.0055**		104.0		**0.16 ***	< 0.052
Diesel Range Organics	250				187	219
Ethyl benzene	2.9			102000	0.24 *	< 0.052
Toluene	1.5			81800	< 0.13 *	< 0.052
Xylenes, total	4.1			204000	0.69 *	< 0.16

* Estimated value, QA/QC criteria not met.



- Analytical Samples
- Field Screened Interval
- Impacted Soil - Left in Place
- Impacted Soil - Removed
- Road Boundary
- Terminal Property Boundary
- Terminal Pipeline Infrastructure

Feet
0 20 40 80

1 Inch = 40 Feet

Figure 2

Site Layout Map
Tank 23 Excavation Oversight
Enbridge Superior Terminal
Superior, Wisconsin

Imagery Source: LMIC 2009 Duluth Imagery.

ENBRIDGE

Tank 23

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

April 13, 2012

Ms. Andrea Nord
Barr Engineering Co.
4700 W 77th St
Minneapolis, MN 55435

Work Order Number: 1201613
RE: 49161092

Enclosed are the results of analyses for samples received by the laboratory on 04/11/12. If you have any questions concerning this report, please feel free to contact me.

All samples will be retained by LEGEND, unless consumed in the analysis, for 30 days from the date of this report and then discarded unless other arrangements are made.

WI Certification #998022410

Prepared by,
LEGEND TECHNICAL SERVICES, INC

Bach Pham
Client Manager I
bpham@legend-group.com

Tyler Jones
Chemist I
tjones@legend-group.com

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TK23-Stockpile-3_0-0	1201613-01	Soil	04/10/12 12:07	04/11/12 08:30

Shipping Container Information

Default Cooler Temperature (°C):

Received on ice: No
Received on melt water: No
Custody seals: No

Temperature blank was not present
Ambient: Yes

Received on ice pack: No
Acceptable (IH/ISO only): No

Case Narrative:

Stockpile sample
DRO - 180
BTEX - NDs

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

DRO/8015B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TK23-Stockpile-3_0-0 (1201613-01) Soil	**Sampled: 04/10/12 12:07**			**Received: 04/11/12 8:30**						
Diesel Range Organics	180	9.3	1.5	mg/kg dry	1	B2D1102	04/11/12	04/11/12	WI(95) DRO	
Surrogate: C-30	*100*			*70-130 %*		"	"	"	"	

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092	
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported: 04/13/12

WI(95) GRO/8015B
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TK23-Stockpile-3_0-0 (1201613-01) Soil	**Sampled: 04/10/12 12:07**			**Received: 04/11/12 8:30**						
Benzene	<0.035	0.035	0.0053	mg/kg dry	1	B2D1108	04/11/12	04/12/12	WI(95) GRO	
Ethylbenzene	<0.035	0.035	0.0065	mg/kg dry	1	"	"	"	"	
Toluene	<0.035	0.035	0.0033	mg/kg dry	1	"	"	"	"	
Xylenes (total)	<0.10	0.10	0.017	mg/kg dry	1	"	"	"	"	
Surrogate: 4-Fluorochlorobenzene	*89.8*			*80-150 %*		"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project: 49161092	
4700 W 77th St	Project Number: 49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager: Ms. Andrea Nord	Date Reported: 04/13/12

PERCENT SOLIDS
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
TK23-Stockpile-3_0-0 (1201613-01) Soil	**Sampled: 04/10/12 12:07**			**Received: 04/11/12 8:30**						
% Solids	**78**			**%**	**1**	**B2D1213**	**04/12/12**	**04/12/12**	**% calculation**	

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project: 49161092	
4700 W 77th St	Project Number: 49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager: Ms. Andrea Nord	Date Reported: 04/13/12

DRO/8015B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B2D1102 - Sonication (Wisc DRO)											
Blank (B2D1102-BLK1)				Prepared & Analyzed: 04/11/12							
Diesel Range Organics	< 8.0	8.0	1.3	mg/kg wet							
Surrogate: C-30	*13.9*			*mg/kg wet*	*16.0*		*87.1*	*70-130*			
LCS (B2D1102-BS1)				Prepared & Analyzed: 04/11/12							
Diesel Range Organics	61.6	8.0	1.3	mg/kg wet	64.0		96.3	70-120			
Surrogate: C-30	*15.4*			*mg/kg wet*	*16.0*		*96.4*	*70-130*			
LCS Dup (B2D1102-BSD1)				Prepared: 04/11/12 Analyzed: 04/13/12							
Diesel Range Organics	63.5	8.0	1.3	mg/kg wet	64.0		99.3	70-120	3.04	20	
Surrogate: C-30	*15.2*			*mg/kg wet*	*16.0*		*95.1*	*70-130*			

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project: 49161092	
4700 W 77th St	Project Number: 49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager: Ms. Andrea Nord	Date Reported: 04/13/12

WI(95) GRO/8015B - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B2D1108 - EPA 5035 Soil (Purge and Trap)											
Blank (B2D1108-BLK1)					Prepared & Analyzed: 04/11/12						
Benzene	< 0.025	0.025	0.0038	mg/kg wet							
Ethylbenzene	< 0.025	0.025	0.0047	mg/kg wet							
Toluene	< 0.025	0.025	0.0024	mg/kg wet							
Xylenes (total)	< 0.075	0.075	0.012	mg/kg wet							
Surrogate: 4-Fluorochlorobenzene	*22.9*			*ug/L*	*25.0*		*91.8*	*80-150*			
LCS (B2D1108-BS1)					Prepared & Analyzed: 04/11/12						
Benzene	93.2			ug/L	100		93.2	80-120			
Ethylbenzene	99.6			ug/L	100		99.6	80-120			
Toluene	97.0			ug/L	100		97.0	80-120			
Xylenes (total)	307			ug/L	300		102	80-120			
Surrogate: 4-Fluorochlorobenzene	*25.3*			*ug/L*	*25.0*		*101*	*80-150*			
LCS Dup (B2D1108-BSD1)					Prepared & Analyzed: 04/11/12						
Benzene	92.9			ug/L	100		92.9	80-120	0.286	20	
Ethylbenzene	98.7			ug/L	100		98.7	80-120	0.920	20	
Toluene	96.4			ug/L	100		96.4	80-120	0.651	20	
Xylenes (total)	307			ug/L	300		102	80-120	0.0853	20	
Surrogate: 4-Fluorochlorobenzene	*24.6*			*ug/L*	*25.0*		*98.3*	*80-150*			
Matrix Spike (B2D1108-MS1)	**Source: 1201613-01**				Prepared & Analyzed: 04/11/12						
Benzene	92.5			ug/L	100	<	92.5	80-120			
Ethylbenzene	99.5			ug/L	100	0.136	99.4	80-120			
Toluene	96.1			ug/L	100	0.419	95.7	80-120			
Xylenes (total)	310			ug/L	300	0.461	103	80-120			
Surrogate: 4-Fluorochlorobenzene	*24.8*			*ug/L*	*25.0*		*99.0*	*80-150*			

LEGEND
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project: 49161092	
4700 W 77th St	Project Number: 49161092 TK 23	Work Order #: 1201613
Minneapolis, MN 55435	Project Manager: Ms. Andrea Nord	Date Reported: 04/13/12

PERCENT SOLIDS - Quality Control
Legend Technical Services, Inc.

Analyte	Result	RL	MDL	Units	Spike Level	Source Result	%REC	%REC Limits	%RPD	%RPD Limit	Notes
Batch B2D1213 - General Preparation											
Duplicate (B2D1213-DUP1)		**Source: 1201647-01**			Prepared & Analyzed: 04/12/12						
% Solids	85.0			%		90.0			5.71	20	

L E G E N D
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

Barr Engineering Co.	Project:	49161092			
4700 W 77th St	Project Number:	49161092 TK 23	Work Order #:	1201613	
Minneapolis, MN 55435	Project Manager:	Ms. Andrea Nord	Date Reported:	04/13/12	

Notes and Definitions

<	Less than value listed
dry	Sample results reported on a dry weight basis
NA	Not applicable. The %RPD is not calculated from values less than the reporting limit.
MDL	Method Detection Limit
RL	Reporting Limit
RPD	Relative Percent Difference
LCS	Laboratory Control Spike = Blank Spike (BS) = Laboratory Fortified Blank (LFB)
MS	Matrix Spike = Laboratory Fortified Matrix (LFM)

L E G E N D
Technical Services, Inc.
www.legend-group.com

88 Empire Drive
St Paul, MN 55103
Tel: 651-642-1150
Fax: 651-642-1239

1201613

Chain of Custody
BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Enbridge
-Please rush TAT-

Project Number: ~~Tank~~ 49161092 resp tank 23
Project Name: Tank 23
Sample Origination State WI (use two letter postal state abbreviation)
COC Number: № 32233

COC 1 of 1
Project Manager: REE
Project QC Contact: AAN
Sampled by: BJL2
Laboratory: Legend

Number of Containers/Preservative — Water: VOCs (HCl) #1; SVOCs (unpreserved) #2; Dissolved Metals (HNO₃); Total Metals (HNO₃); General (unpreserved) #3; Diesel Range Organics (HCl); Nutrients (H₂SO₄) #4 — Soil: VOCs (tared MeOH) #1; GRO, BTEX (tared MeOH) #1; DRO (tared unpreserved); Metals (unpreserved); SVOCs (unpreserved) #2; % Solids (plastic vial, unpres.); BTEX (MeOH preserved) — Total Number Of Containers

	Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Soil	Type: Grab	DRO	% Solids	BTEX	Total Number Of Containers
01	1. TK23-Stockpile-3	0	0	–	4/10/12	1207	X	X	X	X	X	3
	2.											
	3.											
	4.											
	5.											
	6.											
	7.											
	8.											
	9.											
	10.											

-Request rush TAT-

Common Parameter/Container - Preservation Key
#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

No temp

Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
[signature]	(Y) N	4/10/12	1315			
	Y (N)			[signature]	4/11/12	8:30

Samples Shipped VIA: ☐ Air Freight ☒ Federal Express ☐ Sampler ☐ Other: ______ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

Tank 23

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

April 16, 2012

Andrea Nord
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RE: Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Dear Andrea Nord:
Enclosed are the analytical results for sample(s) received by the laboratory on April 06, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Andrea Opland

andrea.opland@pacelabs.com
Project Manager

Enclosures

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Minnesota Certification IDs
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

2 stockpile samples
- high DRO
5400, 6120 ppm

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10187988001	TK23-Stockpile-1	Solid	04/03/12 08:45	04/06/12 10:08
10187988002	TK23-Stockpile-2	Solid	04/03/12 08:55	04/06/12 10:08

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10187988001	TK23-Stockpile-1	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	KT1	5	PASI-M
		% Moisture	JDL	1	PASI-M
10187988002	TK23-Stockpile-2	WI MOD DRO	MT	2	PASI-M
		WI MOD GRO	KT1	5	PASI-M
		% Moisture	JDL	1	PASI-M

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Method: WI MOD DRO
Description: WIDRO GCS
Client: Barr Engineering
Date: April 16, 2012

General Information:
2 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

QC Batch: OEXT/18263

G2: The sample weight in the container did not meet method specifications.
- TK23-Stockpile-1 (Lab ID: 10187988001)
- TK23-Stockpile-2 (Lab ID: 10187988002)

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: OEXT/18263

S4: Surrogate recovery not evaluated against control limits due to sample dilution.
- TK23-Stockpile-1 (Lab ID: 10187988001)
  - n-Triacontane (S)
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - n-Triacontane (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Method: WI MOD DRO
Description: WIDRO GCS
Client: Barr Engineering
Date: April 16, 2012

Analyte Comments:

QC Batch: OEXT/18263

2M: The sample was re-weighed into a new container because the sample was received in a clear container.
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - n-Triacontane (S)

3M: The sample was re-weighed into a new container because the sample was received in a clear container.
- TK23-Stockpile-1 (Lab ID: 10187988001)
  - n-Triacontane (S)

T6: High boiling point hydrocarbons are present in the sample.
- TK23-Stockpile-1 (Lab ID: 10187988001)
  - Diesel Range Organics
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - Diesel Range Organics

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Method: WI MOD GRO
Description: WIGRO GCV
Client: Barr Engineering
Date: April 16, 2012

General Information:
2 samples were analyzed for WI MOD GRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with TPH GRO/PVOC WI ext. with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: GCV/9134

1M: Surrogate recovery outside laboratory control limits due to matrix interferences.
- TK23-Stockpile-1 (Lab ID: 10187988001)
  - a,a,a-Trifluorotoluene (S)
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - a,a,a-Trifluorotoluene (S)

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Method: WI MOD GRO
Description: WIGRO GCV
Client: Barr Engineering
Date: April 16, 2012

Analyte Comments:

QC Batch: GCV/9134

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- TK23-Stockpile-1 (Lab ID: 10187988001)
  - a,a,a-Trifluorotoluene (S)
- TK23-Stockpile-2 (Lab ID: 10187988002)
  - a,a,a-Trifluorotoluene (S)

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Sample: TK23-Stockpile-1 **Lab ID: 10187988001** Collected: 04/03/12 08:45 Received: 04/06/12 10:08 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**6400**	mg/kg	1320	145	50	04/10/12 09:07	04/12/12 10:42		T6
Surrogates									
n-Triacontane (S)	0	%	50-150		50	04/10/12 09:07	04/12/12 10:42		3M, G2, S4
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: TPH GRO/PVOC WI ext.								
Benzene	ND	mg/kg	0.14	0.017	2	04/09/12 15:13	04/12/12 07:04	71-43-2	
Ethylbenzene	**1.1**	mg/kg	0.14	0.023	2	04/09/12 15:13	04/12/12 07:04	100-41-4	
Toluene	ND	mg/kg	0.14	0.017	2	04/09/12 15:13	04/12/12 07:04	108-88-3	
Xylene (Total)	**1.5**	mg/kg	0.43	0.046	2	04/09/12 15:13	04/12/12 07:04	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	64	%	80-125		2	04/09/12 15:13	04/12/12 07:04	98-08-8	1M, D3
Dry Weight	Analytical Method: % Moisture								
Percent Moisture	**21.1**	%	0.10	0.10	1		04/09/12 00:00		

Sample: TK23-Stockpile-2 **Lab ID: 10187988002** Collected: 04/03/12 08:55 Received: 04/06/12 10:08 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**6120**	mg/kg	1140	125	50	04/10/12 09:07	04/12/12 10:35		T6
Surrogates									
n-Triacontane (S)	0	%	50-150		50	04/10/12 09:07	04/12/12 10:35		2M, G2, S4
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: TPH GRO/PVOC WI ext.								
Benzene	**1.0**	mg/kg	0.73	0.088	10	04/09/12 15:13	04/10/12 23:21	71-43-2	
Ethylbenzene	**8.4**	mg/kg	0.73	0.12	10	04/09/12 15:13	04/10/12 23:21	100-41-4	
Toluene	ND	mg/kg	0.73	0.088	10	04/09/12 15:13	04/10/12 23:21	108-88-3	
Xylene (Total)	**10.7**	mg/kg	2.2	0.23	10	04/09/12 15:13	04/10/12 23:21	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	61	%	80-125		10	04/09/12 15:13	04/10/12 23:21	98-08-8	1M, D3
Dry Weight	Analytical Method: % Moisture								
Percent Moisture	**20.8**	%	0.10	0.10	1		04/09/12 00:00		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

QC Batch: GCV/9134 Analysis Method: WI MOD GRO
QC Batch Method: TPH GRO/PVOC WI ext. Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10187988001, 10187988002

METHOD BLANK: 1170322 Matrix: Solid
Associated Lab Samples: 10187988001, 10187988002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Benzene	mg/kg	ND	0.050	04/10/12 18:01	
Ethylbenzene	mg/kg	ND	0.050	04/10/12 18:01	
Toluene	mg/kg	ND	0.050	04/10/12 18:01	
Xylene (Total)	mg/kg	ND	0.15	04/10/12 18:01	
a,a,a-Trifluorotoluene (S)	%	99	80-125	04/10/12 18:01	

LABORATORY CONTROL SAMPLE & LCSD: 1170323 1170324

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Benzene	mg/kg	5	4.7	5.1	94	101	80-120	7	20	
Ethylbenzene	mg/kg	5	4.8	5.0	96	101	80-120	5	20	
Toluene	mg/kg	5	4.8	5.0	96	101	80-120	5	20	
Xylene (Total)	mg/kg	15	14.4	14.9	96	99	80-120	4	20	
a,a,a-Trifluorotoluene (S)	%				95	99	80-125			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1170325 1170326

Parameter	Units	10187822001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	mg/kg	ND	5.4	5.3	5.5	5.2	102	98	80-120	5	20	
Ethylbenzene	mg/kg	ND	5.4	5.3	5.7	5.4	106	102	80-120	5	20	
Toluene	mg/kg	ND	5.4	5.3	5.6	5.4	105	101	80-120	5	20	
Xylene (Total)	mg/kg	ND	16.1	15.9	17.1	16.3	106	102	80-120	5	20	
a,a,a-Trifluorotoluene (S)	%						95	95	80-125			

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

QC Batch: MPRP/31700 Analysis Method: % Moisture
QC Batch Method: % Moisture Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10187988001, 10187988002

SAMPLE DUPLICATE: 1169981

Parameter	Units	10186121004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	21.7	20.3	7	30	

SAMPLE DUPLICATE: 1169982

Parameter	Units	10188022002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	6.2	6.8	9	30	

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

QC Batch: OEXT/18263 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 10187988001, 10187988002

METHOD BLANK: 1170584 Matrix: Solid
Associated Lab Samples: 10187988001, 10187988002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range Organics	mg/kg	ND	5.0	04/12/12 08:03	
n-Triacontane (S)	%	71	50-150	04/12/12 08:03	

LABORATORY CONTROL SAMPLE & LCSD: 1170585 1170586

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Diesel Range Organics	mg/kg	80	61.7	61.2	77	76	70-120	.9	20	
n-Triacontane (S)	%				79	78	50-150			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1170587 1170588

Parameter	Units	10187816009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Diesel Range Organics	mg/kg	ND	72.4	72.7	57.2	52.4	77	70	70-120	9	20	
n-Triacontane (S)	%						79	71	50-150			

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.
ND - Not Detected at or above adjusted reporting limit.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
S - Surrogate
1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

1M	Surrogate recovery outside laboratory control limits due to matrix interferences.
2M	The sample was re-weighed into a new container because the sample was received in a clear container.
3M	The sample was re-weighed into a new container because the sample was received in a clear container.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
G2	The sample weight in the container did not meet method specifications.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
T6	High boiling point hydrocarbons are present in the sample.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187988

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10187988001	**TK23-Stockpile-1**	WI MOD DRO	OEXT/18263	WI MOD DRO	GCSV/9391
10187988002	**TK23-Stockpile-2**	WI MOD DRO	OEXT/18263	WI MOD DRO	GCSV/9391
10187988001	**TK23-Stockpile-1**	TPH GRO/PVOC WI ext.	GCV/9134	WI MOD GRO	GCV/9135
10187988002	**TK23-Stockpile-2**	TPH GRO/PVOC WI ext.	GCV/9134	WI MOD GRO	GCV/9135
10187988001	**TK23-Stockpile-1**	% Moisture	MPRP/31700		
10187988002	**TK23-Stockpile-2**	% Moisture	MPRP/31700		

10187988. 1134

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

Project Number: 4916092

Project Name: Enbridge Tank 23: Historical Impacts Study - SP

Sample Origination State WI (use two letter postal state abbreviation)

COC Number: № 35220

COC 1 of 1

Project Manager: HAW

Project QC Contact: Andrea Nord

Sampled by: CTF

Laboratory: Pace

Number of Containers/Preservative

No.	Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	QC	Water: VOCs (HCl) #1	Water: SVOCs (unpreserved) #2	Water: Dissolved Metals (HNO_3)	Water: Total Metals (HNO_3)	Water: General (unpreserved) #3	Water: Diesel Range Organics (HCl)	Water: Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	Soil: GRO, (BTEX) (tared MeOH) #1	Soil: DRO (tared unpreserved) WI	Soil: Metals (unpreserved)	Soil: SVOCs (unpreserved) #2	Soil: % Solids (plastic vial, unpres.) moisture	Total Number Of Containers	
1.	TK23-Stockpile-1	—	—		4/3/2012	8:45		X		X										X	X			X	3	BTEX, WDRO, % moisture 001
2.	TK23-Stockpile-2	—	—		4/3/2012	8:55		X		X										X	X			X	3	↓ 002
3.																										
4.																										Rush
5.																										TAT
6.																										
7.																										
8.																										
9.																										
10.																										

RUSH! 4/6/12 AMF

Common Parameter/Container - Preservation Key

- #1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
- #2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
- #3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
- #4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
[signature]	(Y) N	4/5/2012	1520	[signature] / Pace T=3.9	4/6/12	1008
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other: ______ Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 090109

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Revised Date: 15Feb2012 Page 1 of 1
	Document Number: F-MN-L-213-rev.02	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Barr   Project # 10187988

[redacted]

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other ______

Tracking #: 7982 5467 7652

Custody Seal on Cooler/Box Present: ☐ yes ☒ no   Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other ______ Temp Blank (Yes) ______ No ______

Thermometer Used (80344042) or 80512447   Type of Ice: (Wet) Blue None   ☐ Samples on ice, cooling process has begun

Cooler Temperature 3.9   Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 4/6/12 AMF

Comments:

Item	Yes	No	N/A	Comments
Chain of Custody Present:	☒	☐	☐	1.
Chain of Custody Filled Out:	☒	☐	☐	2.
Chain of Custody Relinquished:	☒	☐	☐	3.
Sampler Name & Signature on COC:	☐	☒	☐	4.
Samples Arrived within Hold Time:	☒	☐	☐	5.
Short Hold Time Analysis (<72hr):	☐	☒	☐	6.
Rush Turn Around Time Requested:	☒	☐	☐	7.
Sufficient Volume:	☒	☐	☐	8.
Correct Containers Used:	☒	☐	☐	9.
-Pace Containers Used:	☐	☒	☐	
Containers Intact:	☒	☐	☐	10.
Filtered volume received for Dissolved tests	☐	☐	☒	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: SL	☒	☐	☐	12.
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐	☐	☒	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl Samp #
All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4, HCL<2; NaOH >12)	☐	☐	☒	
Exceptions: VOA, Coliform, TOC, Oil and Grease, WI-DRO (water)	☐	☒		Initial when completed / Lot # of added preservative
Headspace in VOA Vials (>6mm):	☐	☐	☒	14.
Trip Blank Present:	☐	☐	☒	15.
Trip Blank Custody Seals Present	☐	☐	☒	
Pace Trip Blank Lot # (if purchased): ______				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: ______ Date/Time: ______

Comments/ Resolution: ______

Project Manager Review: [signature]   Date: 4/10/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

April 24, 2012

Andrea Nord
Barr Engineering
4700 West 77th Street
Minneapolis, MN 55435

RE: Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Dear Andrea Nord:

Enclosed are the analytical results for sample(s) received by the laboratory on April 06, 2012. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Andrea Opland

andrea.opland@pacelabs.com
Project Manager

Enclosures

Tank 23

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Minnesota Certification IDs
1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
EPA Region 8 Certification #: Pace
Florida/NELAP Certification #: E87605
Georgia Certification #: 959
Idaho Certification #: MN00064
Illinois Certification #: 200011
Iowa Certification #: 368
Kansas Certification #: E-10167
Louisiana Certification #: 03086
Louisiana Certification #: LA080009
Maine Certification #: 2007029
Maryland Certification #: 322
Michigan DEQ Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT CERT0092
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Mexico Certification #: Pace
New York Certification #: 11647
North Carolina Certification #: 530
North Dakota Certification #: R-036
North Dakota Certification #: R-036A
Ohio VAP Certification #: CL101
Oklahoma Certification #: D9921
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Tennessee Certification #: 02818
Texas Certification #: T104704192
Washington Certification #: C754
Wisconsin Certification #: 999407970

2 Samples	(ppm) DRO	(ppb) Benz	benzo(a) pyrene
H1S-S1 (.5-.5)	219		
H1S-B1 (2.2-2.2)	187	160	525

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10187991001	TK23-HIS-S1_.5-.5'	Solid	04/03/12 12:32	04/06/12 10:08
10187991002	TK23-HIS-B1_2.2-2.2'	Solid	04/03/12 12:20	04/06/12 10:08
10187991003	Trip Blank	Solid	04/03/12 00:00	04/06/12 10:08

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10187991001	TK23-HIS-S1_.5-.5'	WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	KT1	7	PASI-M
		% Moisture	JDL	1	PASI-M
10187991002	TK23-HIS-B1_2.2-2.2'	WI MOD DRO	JRH	2	PASI-M
		WI MOD GRO	KT1	7	PASI-M
		% Moisture	JDL	1	PASI-M
		EPA 8270 by SIM	JLR	18	PASI-M

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Method: WI MOD DRO
Description: WIDRO GCS
Client: Barr Engineering
Date: April 24, 2012

General Information:
2 samples were analyzed for WI MOD DRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with WI MOD DRO with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

QC Batch: OEXT/18276

S5: Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
- TK23-HIS-S1_.5-.5' (Lab ID: 10187991001)
  - n-Triacontane (S)

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: OEXT/18276

2M: The sample was re-weighed into a new container because the original container was not the standard tared 4oz amber jar.
- TK23-HIS-B1_2.2-2.2' (Lab ID: 10187991002)
  - n-Triacontane (S)

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Method: WI MOD DRO
Description: WIDRO GCS
Client: Barr Engineering
Date: April 24, 2012

Analyte Comments:

QC Batch: OEXT/18276

2M: The sample was re-weighed into a new container because the original container was not the standard tared 4oz amber jar.
- TK23-HIS-S1_.5-.5' (Lab ID: 10187991001)
  - n-Triacontane (S)

T6: High boiling point hydrocarbons are present in the sample.
- TK23-HIS-B1_2.2-2.2' (Lab ID: 10187991002)
  - Diesel Range Organics
- TK23-HIS-S1_.5-.5' (Lab ID: 10187991001)
  - Diesel Range Organics

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Method: WI MOD GRO
Desoription: WIGRO GCV
Client: Barr Engineering
Date: April 24, 2012

General Information:
2 samples were analyzed for WI MOD GRO. All samples were received in acceptable condition with any exceptions noted below.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with TPH GRO/PVOC WI ext. with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

Analyte Comments:

QC Batch: GCV/9143

1M: Surrogate recovery outside laboratory control limits due to matrix interferences.
- TK23-HIS-B1_2.2-2.2' (Lab ID: 10187991002)
  - a,a,a-Trifluorotoluene (S)

D3: Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
- TK23-HIS-B1_2.2-2.2' (Lab ID: 10187991002)
  - a,a,a-Trifluorotoluene (S)

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Method: EPA 8270 by SIM
Desoription: 8270 MSSV PAH by SIM
Client: Barr Engineering
Date: April 24, 2012

General Information:
1 sample was analyzed for EPA 8270 by SIM. All samples were received in acceptable condition with any exceptions noted below.

L2: Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
- TK23-HIS-B1_2.2-2.2' (Lab ID: 10187991002)

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3550 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Surrogates:
All surrogates were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

QC Batch: OEXT/18248

L0: Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
- LCS (Lab ID: 1170014)
  - Chrysene

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: OEXT/18248

A matrix spike and matrix spike duplicate (MS/MSD) were performed on the following sample(s): 10187700002

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
- MS (Lab ID: 1170015)
  - Phenanthrene

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

PROJECT NARRATIVE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Method: EPA 8270 by SIM
Description: 8270 MSSV PAH by SIM
Client: Barr Engineering
Date: April 24, 2012

Duplicate Sample:
All duplicate sample results were within method acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Sample: TK23-HIS-S1_.5-.5' **Lab ID: 10187991001** Collected: 04/03/12 12:32 Received: 04/06/12 10:08 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**219**	mg/kg	54.3	6.0	5	04/11/12 08:13	04/13/12 18:27		T6
Surrogates									
n-Triacontane (S)	352	%	50-150		5	04/11/12 08:13	04/13/12 18:27		2M,S5
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: TPH GRO/PVOC WI ext.								
Benzene	ND	mg/kg	0.052	0.0062	1	04/12/12 11:19	04/13/12 02:30	71-43-2	
Ethylbenzene	ND	mg/kg	0.052	0.0083	1	04/12/12 11:19	04/13/12 02:30	100-41-4	
Toluene	ND	mg/kg	0.052	0.0062	1	04/12/12 11:19	04/13/12 02:30	108-88-3	
1,2,4-Trimethylbenzene	ND	mg/kg	0.052	0.0073	1	04/12/12 11:19	04/13/12 02:30	95-63-6	
1,3,5-Trimethylbenzene	ND	mg/kg	0.052	0.011	1	04/12/12 11:19	04/13/12 02:30	108-67-8	
Xylene (Total)	ND	mg/kg	0.16	0.017	1	04/12/12 11:19	04/13/12 02:30	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	95	%	80-125		1	04/12/12 11:19	04/13/12 02:30	98-08-8	
Dry Weight	Analytical Method: % Moisture								
Percent Moisture	**8.2**	%	0.10	0.10	1		04/09/12 00:00		

Sample: TK23-HIS-B1_2.2-2.2' **Lab ID: 10187991002** Collected: 04/03/12 12:20 Received: 04/06/12 10:08 Matrix: Solid
Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**187**	mg/kg	12.2	1.3	1	04/11/12 08:13	04/13/12 18:04		T6
Surrogates									
n-Triacontane (S)	97	%	50-150		1	04/11/12 08:13	04/13/12 18:04		2M
WIGRO GCV	Analytical Method: WI MOD GRO Preparation Method: TPH GRO/PVOC WI ext.								
Benzene	**0.16**	mg/kg	0.13	0.015	2	04/12/12 11:19	04/16/12 10:43	71-43-2	
Ethylbenzene	**0.24**	mg/kg	0.13	0.020	2	04/12/12 11:19	04/16/12 10:43	100-41-4	
Toluene	ND	mg/kg	0.13	0.015	2	04/12/12 11:19	04/16/12 10:43	108-88-3	
1,2,4-Trimethylbenzene	**0.66**	mg/kg	0.13	0.018	2	04/12/12 11:19	04/16/12 10:43	95-63-6	
1,3,5-Trimethylbenzene	**0.30**	mg/kg	0.13	0.028	2	04/12/12 11:19	04/16/12 10:43	108-67-8	
Xylene (Total)	**0.69**	mg/kg	0.38	0.041	2	04/12/12 11:19	04/16/12 10:43	1330-20-7	
Surrogates									
a,a,a-Trifluorotoluene (S)	55	%	80-125		2	04/12/12 11:19	04/16/12 10:43	98-08-8	1M,D3
Dry Weight	Analytical Method: % Moisture								
Percent Moisture	**25.3**	%	0.10	0.10	1		04/09/12 00:00		
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3550								
Acenaphthene	**67.6**	ug/kg	13.4	6.7	1	04/09/12 09:17	04/10/12 15:55	83-32-9	
Acenaphthylene	ND	ug/kg	13.4	6.7	1	04/09/12 09:17	04/10/12 15:55	208-96-8	

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Sample: TK23-HIS-B1_2.2-2.2' **Lab ID: 10187991002** Collected: 04/03/12 12:20 Received: 04/06/12 10:08 Matrix: Solid

Results reported on a "dry-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH by SIM	Analytical Method: EPA 8270 by SIM Preparation Method: EPA 3550								
Anthracene	**98.7**	ug/kg	13.4	6.7	1	04/09/12 09:17	04/10/12 15:55	120-12-7	
Benzo(a)anthracene	**302**	ug/kg	13.4	0.46	1	04/09/12 09:17	04/10/12 15:55	56-55-3	
Benzo(a)pyrene 7 had DL	**626**	ug/kg	(390) 26.8	0.80	2	04/09/12 09:17	04/11/12 10:15	50-32-8	
Benzo(b)fluoranthene	**662**	ug/kg	26.8	4.1	2	04/09/12 09:17	04/11/12 10:15	205-99-2	
Benzo(g,h,i)perylene	**148**	ug/kg	13.4	0.44	1	04/09/12 09:17	04/10/12 15:55	191-24-2	
Benzo(k)fluoranthene	**267**	ug/kg	13.4	1.6	1	04/09/12 09:17	04/10/12 15:55	207-08-9	
Chrysene	**327**	ug/kg	13.4	0.44	1	04/09/12 09:17	04/10/12 15:55	218-01-9	L2
Dibenz(a,h)anthracene	**66.6**	ug/kg	13.4	0.46	1	04/09/12 09:17	04/10/12 15:55	53-70-3	
Fluoranthene	**439**	ug/kg	13.4	6.7	1	04/09/12 09:17	04/10/12 15:55	206-44-0	
Fluorene	**80.0**	ug/kg	13.4	0.50	1	04/09/12 09:17	04/10/12 15:55	86-73-7	
Indeno(1,2,3-cd)pyrene	**168**	ug/kg	13.4	0.38	1	04/09/12 09:17	04/10/12 15:55	193-39-5	
Naphthalene	**29.0**	ug/kg	13.4	0.25	1	04/09/12 09:17	04/10/12 15:55	91-20-3	
Phenanthrene	**324**	ug/kg	13.4	0.38	1	04/09/12 09:17	04/10/12 15:55	85-01-8	
Pyrene	**463**	ug/kg	26.8	1.0	2	04/09/12 09:17	04/11/12 10:15	129-00-0	
Surrogates									
2-Fluorobiphenyl (S)	67	%	30-125		1	04/09/12 09:17	04/10/12 15:55	321-60-8	
Terphenyl-d14 (S)	73	%	30-146		1	04/09/12 09:17	04/10/12 15:55	1718-51-0	

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

QC Batch: GCV/9143 Analysis Method: WI MOD GRO
QC Batch Method: TPH GRO/PVOC WI ext. Analysis Description: WIGRO Solid GCV
Associated Lab Samples: 10187991001, 10187991002

METHOD BLANK: 1172072 Matrix: Solid
Associated Lab Samples: 10187991001, 10187991002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,2,4-Trimethylbenzene	mg/kg	ND	0.050	04/12/12 19:30	
1,3,5-Trimethylbenzene	mg/kg	ND	0.050	04/12/12 19:30	
Benzene	mg/kg	ND	0.050	04/12/12 19:30	
Ethylbenzene	mg/kg	ND	0.050	04/12/12 19:30	
Toluene	mg/kg	ND	0.050	04/12/12 19:30	
Xylene (Total)	mg/kg	ND	0.15	04/12/12 19:30	
a,a,a-Trifluorotoluene (S)	%	98	80-125	04/12/12 19:30	

LABORATORY CONTROL SAMPLE & LCSD: 1172073 1172074

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1,2,4-Trimethylbenzene	mg/kg	5	4.9	4.7	97	93	80-120	4	20	
1,3,5-Trimethylbenzene	mg/kg	5	5.0	4.7	100	95	80-120	5	20	
Benzene	mg/kg	5	5.0	4.7	101	94	80-120	7	20	
Ethylbenzene	mg/kg	5	5.2	4.9	105	97	80-120	7	20	
Toluene	mg/kg	5	5.1	4.7	103	93	80-120	10	20	
Xylene (Total)	mg/kg	15	15.7	14.2	104	95	80-120	10	20	
a,a,a-Trifluorotoluene (S)	%				97	98	80-125			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1172075 1172076

Parameter	Units	10187816009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,2,4-Trimethylbenzene	mg/kg	ND	5.9	5.8	6.5	6.1	109	105	80-120	6	20	
1,3,5-Trimethylbenzene	mg/kg	ND	5.9	5.8	6.7	6.2	112	107	80-120	7	20	
Benzene	mg/kg	ND	5.9	5.8	6.6	6.1	111	105	80-120	8	20	
Ethylbenzene	mg/kg	ND	5.9	5.8	6.9	6.4	116	111	80-120	7	20	
Toluene	mg/kg	ND	5.9	5.8	6.8	6.3	114	108	80-120	8	20	
Xylene (Total)	mg/kg	ND	17.9	17.4	20.7	19.3	116	111	80-120	7	20	
a,a,a-Trifluorotoluene (S)	%						95	96	80-125			

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

QC Batch: MPRP/31702
QC Batch Method: % Moisture
Analysis Method: % Moisture
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 10187991001, 10187991002

SAMPLE DUPLICATE: 1170017

Parameter	Units	10187822001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.8	8.4	4	30	

SAMPLE DUPLICATE: 1170101

Parameter	Units	10187976001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.1	4.0	2	30	

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

QC Batch: OEXT/18248
QC Batch Method: EPA 3550
Analysis Method: EPA 8270 by SIM
Analysis Description: 8270 Solid PAH by SIM MSSV
Associated Lab Samples: 10187991002

METHOD BLANK: 1170013 Matrix: Solid
Associated Lab Samples: 10187991002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Acenaphthene	ug/kg	ND	10.0	04/10/12 09:28	
Acenaphthylene	ug/kg	ND	10.0	04/10/12 09:28	
Anthracene	ug/kg	ND	10.0	04/10/12 09:28	
Benzo(a)anthracene	ug/kg	ND	10.0	04/10/12 09:28	
Benzo(a)pyrene	ug/kg	ND	10.0	04/10/12 09:28	
Benzo(b)fluoranthene	ug/kg	ND	10.0	04/10/12 09:28	
Benzo(g,h,i)perylene	ug/kg	ND	10.0	04/10/12 09:28	
Benzo(k)fluoranthene	ug/kg	ND	10.0	04/10/12 09:28	
Chrysene	ug/kg	ND	10.0	04/10/12 09:28	
Dibenz(a,h)anthracene	ug/kg	ND	10.0	04/10/12 09:28	
Fluoranthene	ug/kg	ND	10.0	04/10/12 09:28	
Fluorene	ug/kg	ND	10.0	04/10/12 09:28	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	10.0	04/10/12 09:28	
Naphthalene	ug/kg	ND	10.0	04/10/12 09:28	
Phenanthrene	ug/kg	ND	10.0	04/10/12 09:28	
Pyrene	ug/kg	ND	10.0	04/10/12 09:28	
2-Fluorobiphenyl (S)	%	78	30-125	04/10/12 09:28	
Terphenyl-d14 (S)	%	85	30-146	04/10/12 09:28	

LABORATORY CONTROL SAMPLE: 1170014

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acenaphthene	ug/kg	33.3	19.5	59	48-125	
Acenaphthylene	ug/kg	33.3	18.5	56	47-125	
Anthracene	ug/kg	33.3	19.4	58	55-125	
Benzo(a)anthracene	ug/kg	33.3	19.8	59	57-125	
Benzo(a)pyrene	ug/kg	33.3	21.5	64	63-125	
Benzo(b)fluoranthene	ug/kg	33.3	23.5	70	52-125	
Benzo(g,h,i)perylene	ug/kg	33.3	21.1	63	59-125	
Benzo(k)fluoranthene	ug/kg	33.3	20.4	61	60-125	
Chrysene	ug/kg	33.3	19.6	59	62-125	L0
Dibenz(a,h)anthracene	ug/kg	33.3	20.6	62	60-125	
Fluoranthene	ug/kg	33.3	21.1	63	63-125	
Fluorene	ug/kg	33.3	20.6	62	54-125	
Indeno(1,2,3-cd)pyrene	ug/kg	33.3	20.5	61	57-125	
Naphthalene	ug/kg	33.3	17.9	54	46-125	
Phenanthrene	ug/kg	33.3	20.1	60	53-125	
Pyrene	ug/kg	33.3	21.4	64	63-125	
2-Fluorobiphenyl (S)	%			69	30-125	
Terphenyl-d14 (S)	%			75	30-146	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1170015 1170016

Parameter	Units	10187700002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Acenaphthene	ug/kg	ND	34.7	34.8	26.9	25.5	77	73	30-150	5	30	
Acenaphthylene	ug/kg	ND	34.7	34.8	22.3	21.1	64	61	30-127	5	30	
Anthracene	ug/kg	ND	34.7	34.8	30.0	27.9	71	65	30-150	7	30	
Benzo(a)anthracene	ug/kg	ND	34.7	34.8	29.8	27.3	86	78	30-128	9	30	
Benzo(a)pyrene	ug/kg	ND	34.7	34.8	27.5	26.3	79	75	30-130	4	30	
Benzo(b)fluoranthene	ug/kg	ND	34.7	34.8	30.4	28.7	87	82	30-131	6	30	
Benzo(g,h,i)perylene	ug/kg	ND	34.7	34.8	24.5	20.2	70	58	30-149	19	30	
Benzo(k)fluoranthene	ug/kg	ND	34.7	34.8	24.5	24.0	71	69	30-149	2	30	
Chrysene	ug/kg	ND	34.7	34.8	38.4	33.8	82	69	30-150	13	30	
Dibenz(a,h)anthracene	ug/kg	ND	34.7	34.8	23.8	19.4	68	56	30-150	20	30	
Fluoranthene	ug/kg	0.031 mg/kg	34.7	34.8	79.5	66.0	140	101	30-150	19	30	
Fluorene	ug/kg	ND	34.7	34.8	25.7	24.1	74	69	40-125	7	30	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	34.7	34.8	22.6	19.2	65	55	30-150	16	30	
Naphthalene	ug/kg	ND	34.7	34.8	21.0	19.7	60	56	32-125	6	30	
Phenanthrene	ug/kg	0.045 mg/kg	34.7	34.8	94.4	84.6	141	112	30-134	11	30	M1
Pyrene	ug/kg	0.018 mg/kg	34.7	34.8	58.0	48.7	114	87	30-150	17	30	
2-Fluorobiphenyl (S)	%						77	70	30-125			
Terphenyl-d14 (S)	%						75	68	30-146			

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

QC Batch: OEXT/18276 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 10187991001, 10187991002

METHOD BLANK: 1171231 Matrix: Solid
Associated Lab Samples: 10187991001, 10187991002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range Organics	mg/kg	ND	5.0	04/13/12 16:00	
n-Triacontane (S)	%	82	50-150	04/13/12 16:00	

LABORATORY CONTROL SAMPLE & LCSD: 1171232 1171233

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Diesel Range Organics	mg/kg	80	71.7	73.2	90	91	70-120	2	20	
n-Triacontane (S)	%				97	96	50-150			

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.
ND - Not Detected at or above adjusted reporting limit.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
S - Surrogate
1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

ANALYTE QUALIFIERS

1M	Surrogate recovery outside laboratory control limits due to matrix interferences.
2M	The sample was re-weighed into a new container because the original container was not the standard tared 4oz amber jar.
D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
L0	Analyte recovery in the laboratory control sample (LCS) was outside QC limits.
L2	Analyte recovery in the laboratory control sample (LCS) was below QC limits. Results may be biased low.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).
T6	High boiling point hydrocarbons are present in the sample.

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 49161092 Enbridge Tank 23
Pace Project No.: 10187991

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10187991001	TK23-HIS-S1_.5-.5'	WI MOD DRO	OEXT/18276	WI MOD DRO	GCSV/9390
10187991002	TK23-HIS-B1_2.2-2.2'	WI MOD DRO	OEXT/18276	WI MOD DRO	GCSV/9390
10187991001	TK23-HIS-S1_.5-.5'	TPH GRO/PVOC WI ext.	GCV/9143	WI MOD GRO	GCV/9144
10187991002	TK23-HIS-B1_2.2-2.2'	TPH GRO/PVOC WI ext.	GCV/9143	WI MOD GRO	GCV/9144
10187991001	TK23-HIS-S1_.5-.5'	% Moisture	MPRP/31702		
10187991002	TK23-HIS-B1_2.2-2.2'	% Moisture	MPRP/31702		
10187991002	TK23-HIS-B1_2.2-2.2'	EPA 3550	OEXT/18248	EPA 8270 by SIM	MSSV/7920

Chain of Custody

BARR
4700 West 77th Street
Minneapolis, MN 55435-4803
(952) 832-2600

10187991 1134

Project Number: 4961092

Project Name: Enbridge Tank 23: Historical Impact Study

Sample Origination State WI (use two letter postal state abbreviation)

COC Number: № 35225

COC 1 of 1

Project Manager: HAW

Project QC Contact: Andrea Nord

Sampled by: CTF

Laboratory: Pace

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Type: Grab	Type: Comp.	Type: QC	Water: VOCs (HCl) #1	Water: SVOCs (unpreserved) #2	Water: Dissolved Metals (HNO_3)	Water: Total Metals (HNO_3)	Water: General (unpreserved) #3	Water: Diesel Range Organics (HCl)	Water: Nutrients (H_2SO_4) #4	Soil: VOCs (tared MeOH) #1	Soil: GRO, BTEX (tared MeOH) #2	Soil: DRO (tared unpreserved) WI	Soil: Metals (unpreserved)	Soil: SVOCs (unpreserved) #2	Soil: % Solids (plastic vial, unpres.) moisture	Soil: PVOC (without MTBE)	Soil: PAH	Total Number Of Containers	
1. TK23-H15-S1	.5	.5	Ft	4/3/2012	12:32		X	X												X			X	X		3	WIDRO, PVOC (w/out MTBE) + moisture 001
2. TK23-H15-B1	22	22	↓	↓	12:20		↓	↓												↓			↓	↓	X	4	WIDRO, PVOC (w/out MTBE) moisture, + PAH 002
3.																											
4.																											
5.																											Normal TAT
6.																											
7.																											
8.																											
9.																											
10.																											

Common Parameter/Container - Preservation Key

#1 - Volatile Organics = BTEX, GRO, TPH, 8260 Full List
#2 - Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide/PCBs
#3 - General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate
#4 - Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By:	On Ice?	Date	Time	Received by:	Date	Time
[signature]	(Y) N	4/5/2012	1520	[signature] Pace T=3.9	4/6/12	1008
Relinquished By:	On Ice? Y N	Date	Time	Received by:	Date	Time

Samples Shipped VIA: ☐ Air Freight ☐ Federal Express ☐ Sampler ☐ Other: ____ | Air Bill Number:

Distribution: White-Original Accompanies Shipment to Lab; Yellow - Field Copy; Pink - Lab Coordinator

H:\RLG\STDFORMS\Chain Of Custody Form 2009 RLG Rev. 09/01/09

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Revised Date: 15Feb2012 Page 1 of 1
	Document Number: F-MN-L-213-rev.02	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: Barr   Project # 10187991

[redacted]

Courier: ☒ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other ____
Tracking #: 7982 5467 7652

Custody Seal on Cooler/Box Present: ☐ yes ☒ no   Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other ____   Temp Blank: (Yes) ____ No ____

Thermometer Used (80344042) or 80512447   Type of Ice: (Wet) Blue None   ☐ Samples on ice, cooling process has begun

Cooler Temperature 3.9   Biological Tissue is Frozen: Yes No

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 4/6/12 AMF

		Comments:
Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☒No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☒No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☒No ☐N/A	7.
Sufficient Volume:	☒Yes ☐No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☒No ☐N/A	
Containers Intact:	☒Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: SL	☐Yes ☒No ☐N/A	12. Extra bottle may be Trip Blank
All containers needing acid/base preservation have been checked. Noncompliance are noted in 13.	☐Yes ☐No ☒N/A	13. ☐ HNO3 ☐ H2SO4 ☐ NaOH ☐ HCl
All containers needing preservation are found to be in compliance with EPA recommendation. (HNO3, H2SO4, HCL<2; NaOH >12)	☐Yes ☐No ☒N/A	Samp #
Exceptions: VOA, Coliform, TOC, Oil and Grease, WI-DRO (water)	☐Yes ☒No	Initial when completed / Lot # of added preservative
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☒N/A	14.
Trip Blank Present:	☐Yes ☐No ☒N/A	15.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: ____   Date/Time: ____

Comments/ Resolution: ____

Project Manager Review: [signature]   **Date:** 4/6/12

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)