

CONSTRUCTION COMPLETION REPORT
PAOC-18 INTERIM RESPONSE ACTIONS

COMPANY VEHICLE OPERATIONS AREA
YPSILANTI, MICHIGAN

REVISED JANUARY 2006

JANUARY 2005
REF. NO. 17303 (9)

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LIST OF ACRONYMS

AMSL	Above Mean Sea Level
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
CRA	Conestoga-Rovers & Associates, Inc.
CVO	Company Vehicle Operations
DNAPL	Dense Non-Aqueous Phase Liquid
EOC	Extent of Contamination
ENCORE	Environmental Corporate Remediation Company, Inc.
EZ	Exclusion Zone
GM	General Motors Corporation
Hardman	Hardman Construction, Inc.
IRA	Interim Response Actions
MDEQ	Michigan Department of Environmental Quality
O&M	Operations and Maintenance
PAOC	Potential Area of Concern
PPE	Personal Protective Equipment
QEKGS	QEK Global Systems, Inc.
Site	GM Company Vehicle Operations Area
SOW	Scope of Work

1.0 INTRODUCTION

1.1 GENERAL

Conestoga-Rovers & Associates, Inc. (CRA) prepared this Construction Completion Report (Report) to document the Interim Response Actions (IRA) completed for Potential Area of Concern (PAOC) 18 within the General Motors Corporation (GM) Company Vehicle Operations (CVO) Area (Site). The Site is located at 2901 Tyler Road in Ypsilanti, Michigan, as shown in Drawing G-1 of the record drawings (Appendix A). A plan of the sheetpile wall installation at PAOC 18 is presented on Drawing G-2 of the record drawings. The IRA consisted of:

- delineation of dense-non aqueous phase liquids (DNAPL) within PAOC 18;
- Site preparation including brush clearing, tree removal, temporary fence removal, and Site trailer setup;
- sheetpile installation at PAOC 18 adjacent to the south shore of Tyler Pond and centered near the stormwater discharge labeled as Outfall #12;
- diversion of stormwater runoff from Outfall #12;
- capping of the slope above the sheetpile installation using clay and topsoil; and,
- Site restoration and demobilization.

Construction activities were completed between October 14, 2004 and November 17, 2004 within the proposed project schedule (CRA, October 5, 2004). The IRA was completed for the Environmental Corporate Remediation Company, Inc. (ENCORE), a wholly owned subsidiary of GM. The Site is owned by GM. Site work was conducted under the direction of ENCORE.

1.2 BASIS FOR REMEDIAL ACTION

A Phase III Extent of Contamination (EOC) Study Addendum conducted in the spring and summer of 2004 confirmed the presence of DNAPL within PAOC 18 and several other constituents in both soil and groundwater exceeding applicable Michigan Act 451 Part 201 Industrial/Commercial Criteria (CRA, April 2004). Based on the proximity of the DNAPL with respect to Tyler Pond, ENCORE directed an expedited IRA to contain the material and prevent a release to the pond.

1.3 REPORT ORGANIZATION

This Report is presented in the following sections:

- 1.0 Introduction
- 2.0 Scope of Work
- 3.0 Project Management
- 4.0 Health and Safety
- 5.0 Project Quality Assurance
- 6.0 Construction Activities
- 7.0 Recommended Operation and Maintenance Activities
- 8.0 References

Record Drawings are provided in Appendix A, while Submittals are presented in Appendix B.

2.0 SCOPE OF WORK

2.1 DNAPL DELINEATION

A delineation investigation of the DNAPL within PAOC 18 was conducted between May and August of 2004 so an adequate IRA could be designed for the Site (CRA, September 13, 2004).

2.2 SITE PREPARATION

Site preparation included the following activities:

- equipment mobilization;
- Site trailer set up;
- clearing of brush and trees surrounding PAOC 18;
- temporary removal of an existing fence across PAOC 18; and,
- decontamination as needed;

Site preparation activities were completed between October 7, 2004 and October 13, 2004.

2.3 SHEETPILE INSTALLATION

Sheetpile installation included the following activities:

- mobilization of sheet pile contractor (Hardman Construction, Inc. [Hardman]) equipment, facilities and personnel;
- installation of silt fencing;
- temporary fence removal;
- temporary disconnection of overhead power lines;
- decontamination as needed;
- installation of permanent sheet pile;
- placement of a six inch clay cap within the interior side of the sheetpile installation;
- placement of topsoil, grading and seeding; and
- demobilization of sheet pile equipment and personnel (Hardman).

During the sheetpile installation, an Exclusion Zone (EZ) was placed around the active work area using plastic barrier fencing. Only authorized personnel were allowed to enter the EZ and all personnel entering the EZ were required to wear appropriate personal protective equipment (PPE) as defined in the Site Health and Safety Plan (CRA, October 2004).

Sheet pile installation was completed between October 14, 2004 and October 21, 2004. Other activities were completed between October 7, 2004 and November 17, 2004.

2.4 OUTFALL #12 DIVERSION

Historically, Site stormwater was transferred via a pump station to a wastewater treatment plant located at the Former Assembly Plant just west of the Site. This wastewater treatment plant is no longer in operation. Since the decommissioning of the former wastewater treatment plant, stormwater has directly discharged from the CVO parking lot to Tyler Pond through several outfall points, including Outfall #12.

Since Outfall #12 is situated within the area of the IRA sheetpile installation, it was decided that stormwater discharges to Outfall #12 should be diverted to Outfalls #13, and #14. It was concluded that Outfalls #13 and #14 are of sufficient size and capacity to accept the additional flow generated by removing Outfall #12 (CRA, October 27, 2004). The diversion of Outfall #12 was completed in the area shown on Drawing G-2, which incorporated the following activities:

- installing a permanent plug to block the northern and western storm sewer lines at Outfall #12; and,
- installing a permanent plug at the next manhole west of Outfall #12, in order to prevent stormwater backflow from Outfall #11.

The diversion of stormwater discharges away from Outfall #12 was completed on November 3, 2004.

2.5 SITE CLEANUP AND DEMOBILIZATION

Site cleanup and demobilization included the following activities:

- installation of a new 6-foot chain linked barbed wire fence along the northern perimeter of the Site parking lot within PAOC 18;
- demobilization of sheet pile contractor (Hardman) equipment, facilities and personnel;
- restoration of an electrical conduit associated with overhead lighting near PAOC 18;
- sweeping the parking lot within PAOC 18; and,
- decontaminating and demobilizing equipment.

Site cleanup and demobilization activities were completed between November 15, 2004 and November 17, 2004.

Equipment decontamination was conducted in accordance with the Site Health and Safety Plan (CRA, October 2004). The only piece of equipment requiring decontamination during the sheetpile installation was a backhoe.

The backhoe was decontaminated by placing the backhoe bucket over a designated roll-off box for decontamination waste. While positioned over the roll-off box, the backhoe bucket was dry scrubbed with a brush, pressured washed, and cleaned with a 50/50 mixture of water and Simple Green®.

PPE for Site personnel was provided in accordance with the Site Health and Safety Plan (CRA, October 2004). PPE required during the sheetpile installation activities consisted of Level D items including hard hats, safety glasses, ear plugs, tyvek coveralls, leather gloves, and steel toed boots. Working conditions were monitored by the designated health and safety officer for appropriate PPE requirements.

3.0 PROJECT MANAGEMENT

3.1 CONSTRUCTION MANAGEMENT

The conceptual IRA design and final design were completed by CRA. CRA provided construction oversight and documentation of the IRA activities conducted at the Site. Responsibilities included communication with GM and ENCORE, and inspection of contractor activities to ensure that the IRA was properly constructed and implemented.

CRA Services was retained by ENCORE as the general contractor for completion of the IRA activities. General services performed by CRA Services at the Site included preparation of the Site for construction activities, construction of erosion controls, and all other general activities. CRA Services retained the following subcontractors to perform specialized remedial tasks:

- i) Doug's Tree Care Service, Inc. from Waterford, Michigan to complete the clearing and grubbing within the sheet pile installation area;
- ii) Hardman from Ludington, Michigan to complete the sheet pile installation; and,
- iii) Nationwide Fence and Supply Co., from Chesterfield, Michigan to complete the installation of new perimeter fence.

3.2 PROJECT DOCUMENTATION

A daily Site logbook was maintained by CRA, as well as weekly construction meetings and meeting summary memorandums (submitted to ENCORE), for documentation of Site activities. Records that were maintained on a daily basis included weather conditions, on-Site personnel, and remedial activities conducted. Mr. Russel Aylsworth recorded CRA's Health and Safety information during the IRA. Copies of the project documentation and reporting are maintained at CRA's office in Plymouth, Michigan.

Record Drawings documenting installed conditions were maintained by CRA throughout the project. Final Record Drawings are presented in Appendix A.

3.3 SITE SECURITY

QEK Global Systems, Inc. (QEKGS) and Site personnel maintained Site security throughout the duration of the IRA activities. A Site sign in sheet was maintained in the

Site trailer. A six-foot high chain link fence topped with barbed wire surrounds the entire Site. The new fencing now encloses the Site parking lot and prevents direct access to the sheetpile installation from the Site parking lot. Drawing G-2 shows the new fence line. The entrance gate was closed and locked when the Site was not occupied.

An additional security guard was provided daily by QEKGS between the hours of 5:30 PM and 6:00 AM to maintain 24-hour security during the IRA activities.

4.0 HEALTH AND SAFETY

Site personnel completed the IRA in accordance with the Site Health and Safety Plan (CRA, October 2004). A daily safety meeting was conducted before initiating work activities. GM performed an internal health and safety audit at the beginning of the IRA. No unsafe work practices were observed. No health and safety related issues or incidents occurred during the completion of IRA at the Site.

5.0 PROJECT QUALITY ASSURANCE

5.1 SHEETPILING

The sheetpiling meets American Society for Testing and Materials (ASTM) Standard A6 - Standard Specification for General Requirements for Sheetpiling and A572 - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel (Skyline Steel Corporation, September 2003).

CRA provided continuous oversight and documentation of the IRA activities to ensure that the sheetpiling was installed in accordance with CRA's specifications.

Submittals reviewed and approved by CRA for quality assurance include the sheetpile manufacturer's data sheets (i.e. mill specifications), documentation covering the quality and source of the clay backfill material, and documentation covering the quality and source of the topsoil cover material installed during the IRA activities (Appendix B).

6.0 CONSTRUCTION ACTIVITIES

Documentation of Site construction is provided in the Record Drawings, which are presented in Appendix A.

6.1 SHEETPILING

The sheet piles were installed in accordance with the design specifications (CRA, October 5, 2004). The sheet pile was driven to an elevation (top of pile) of 701.5 feet above mean sea level (AMSL) along Tyler Pond, 714 feet AMSL along the top of the east sheetpile wall, and 712 feet AMSL along the top of the west sheetpile wall. This corresponds to bottom of sheetpile elevations of 691.6 feet AMSL. Drawing G-2 presents the sheet pile terminal elevations and Drawing G-3 presents cross sections of the sheetpile area. Drawing G-2 presents surveyed sheetpile elevations as installed and Drawing G-4 presents design profiles for the sheetpile and wing walls. A small area at the top of the west wall was excavated in order to drive the sheet pile to the determined depth of the clay layer. The sheet piles were cut to stick up approximately 2 feet above grade.

6.1.1 SHEET PILE INSTALLATION

The sheetpile installation consisted of 24-inch, “Z” shaped AZ-18 sheet piles from Skyline Steel Corporation installed utilizing a 100-ton crane with an addition of a vibratory hammer. Hardman monitored each sheet during installation for plumbness and alignment with a level. The plumbness and alignment was necessary to ensure the proper installation of the sheet piles. The sheet pile alignment was confirmed through surveys. Sheet piling elevations are provided on Drawing G-2 in the Record Drawings in Appendix A.

Every other sheet was welded together to create a watertight seal at these joints. Two sheets were driven into place at a time, which is the maximum width that could be driven at one time. A bentonite paste was applied to the non-welded joints of the sheet piles before installation to create a watertight seal between these joints. The application of the seal consisted of using a trowel to apply the bentonite paste while sheets layed horizontal. The integrity of the sheet piling seal was checked by visual inspection throughout the installation of the sheet piles.

6.2 EARTHWORK ACTIVITIES

Earthwork activities performed at the Site included grading the interior of the sheetpile installation for the placement of a six-inch clay cap and surface restoration with topsoil.

7.0 REFERENCES

ASTM, 2004. *A572/A572M-04, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel*. ASTM International

ASTM, 2004. *A6/A6M-04b Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling*. ASTM International

CRA, 2004. *Health and Safety Plan for REALM/ENCORE Participants, Former Willow Run Assembly Plant Company Vehicle Operations Area*. October.

CRA,2004. *Impervious Barrier Wall, IRA Design and Construction Work Plan*. Memorandum from Fred W. Bickle to Ken Richards. October 5.

CRA,2004. *Interim Status Update – PAOC18, DNAPL Investigation and IRA* Memorandum from Fred W. Bickle to Ken Richards. September 13.

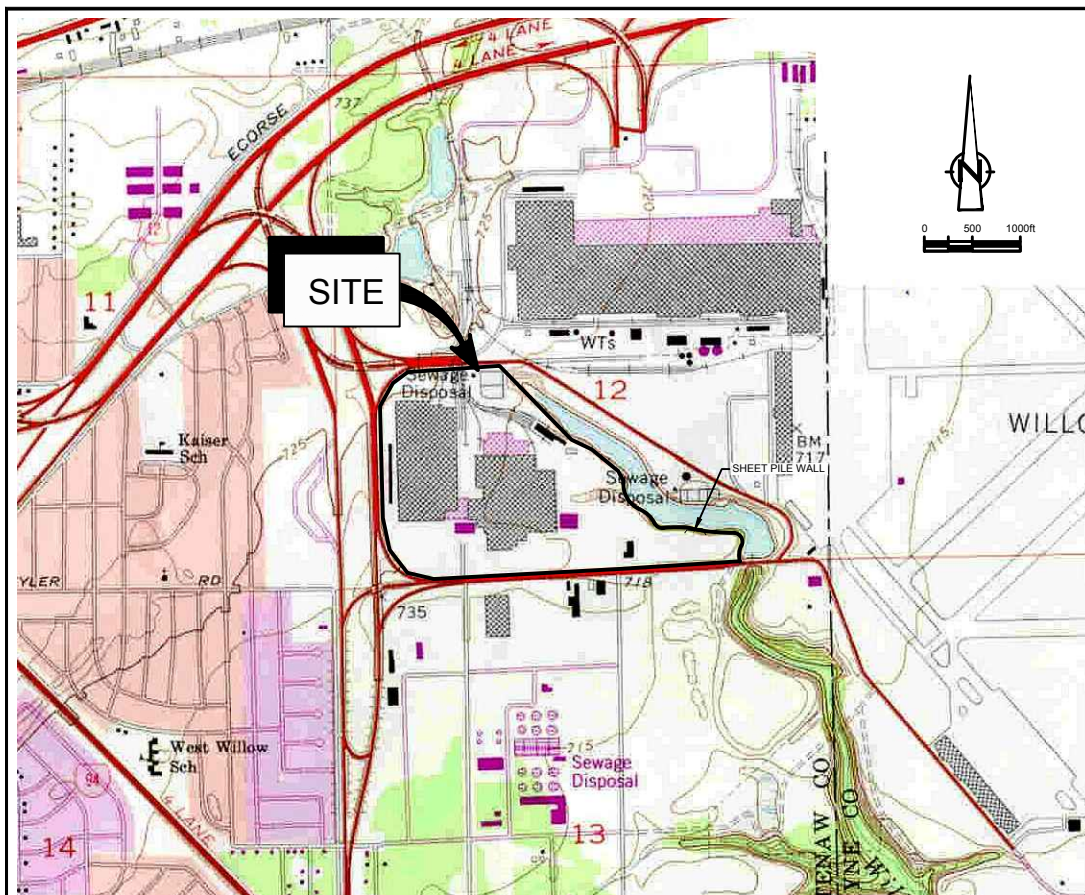
CRA,2004. *Permanent Sewer Plug Locations*. Memorandum from Beth Landale to Matt Abdallah. October 27.

CRA, 2004. *Supplemental Phase III EOC Work Plan – Addendum No. 1, Company Vehicle Operations Area*. April

Skyline Steel Corporation, 2003. *AZ Hot Rolled Steel Sheet Piling Data Sheet*. September

APPENDIX A

RECORD DRAWINGS



KEY MAP

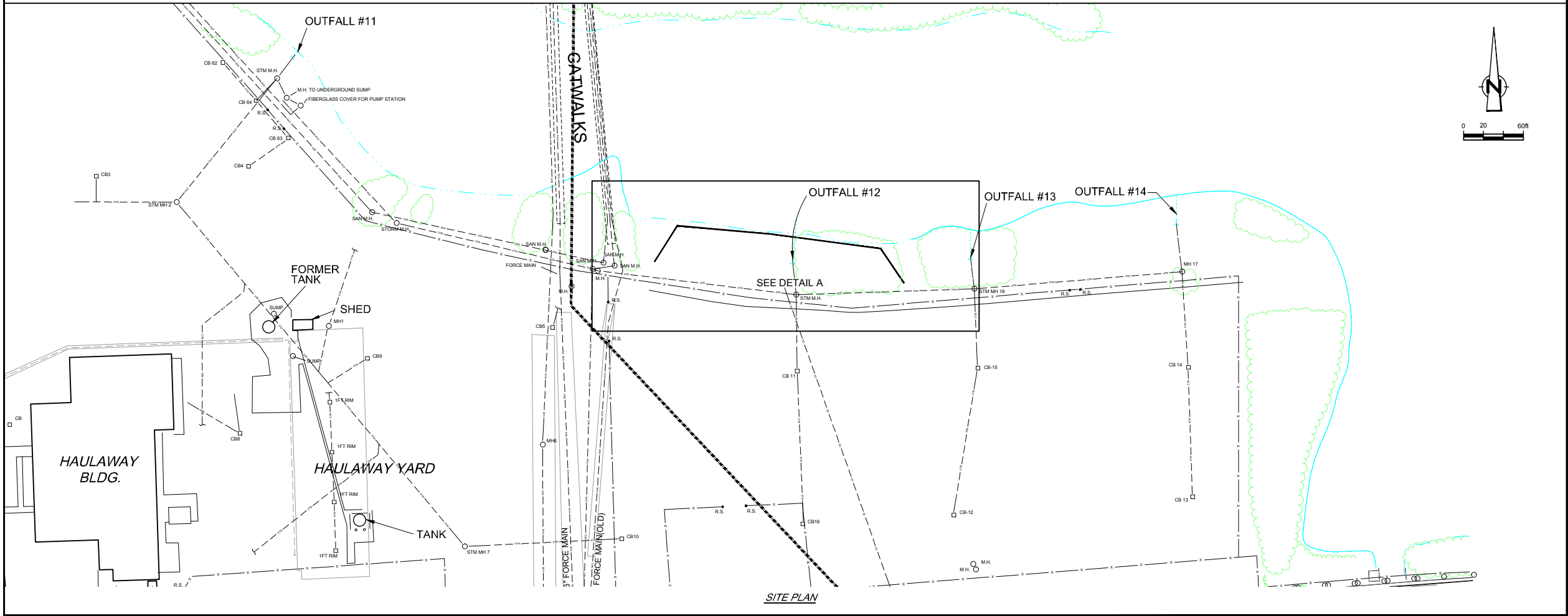
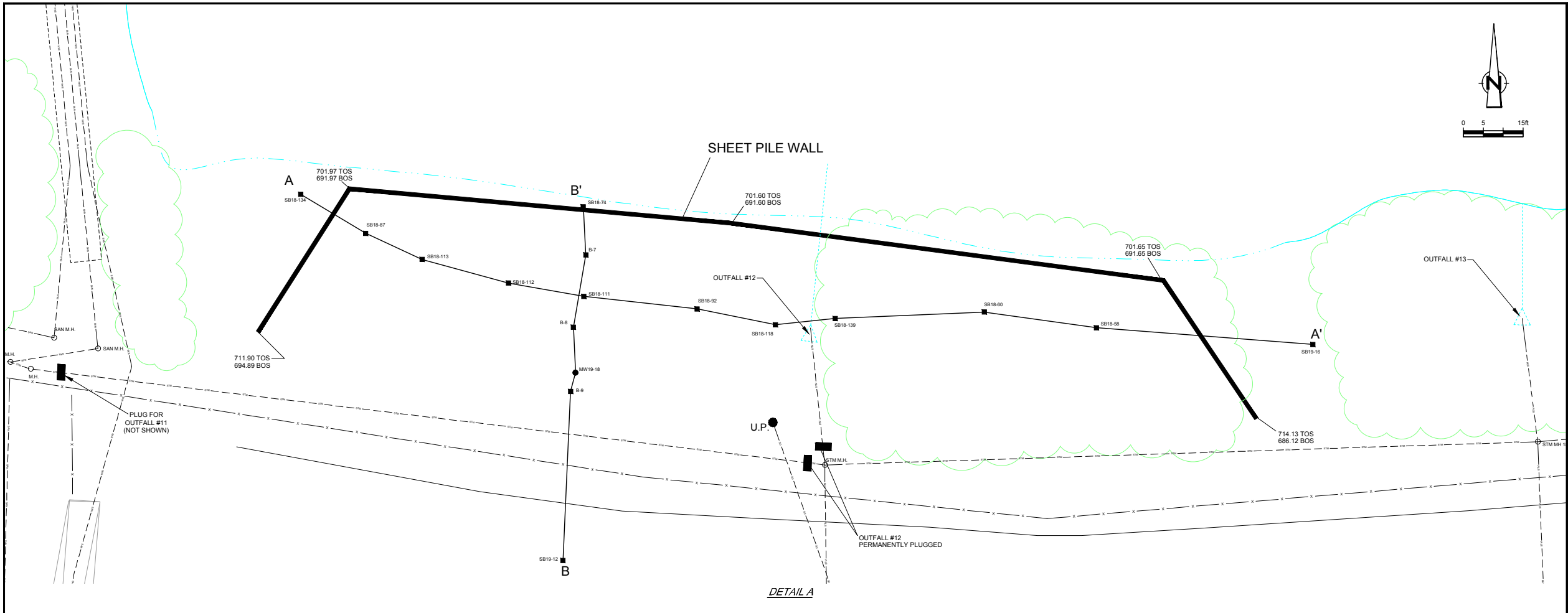
DRAWING INDEX

DWG NO.	TITLE
G-1	COVER SHEET
G-2	LOCATION OF SHEET PILE WALL
G-3	CROSS SECTIONS

DESIGN DRAWINGS

CONSTRUCTION COMPLETION REPORT COMPANY VEHICLE OPERATIONS AREA FORMER WILLOW RUN ASSEMBLY PLANT YPSILANTI, MICHIGAN





Nº	Revision	Date	Initial

LEGEND

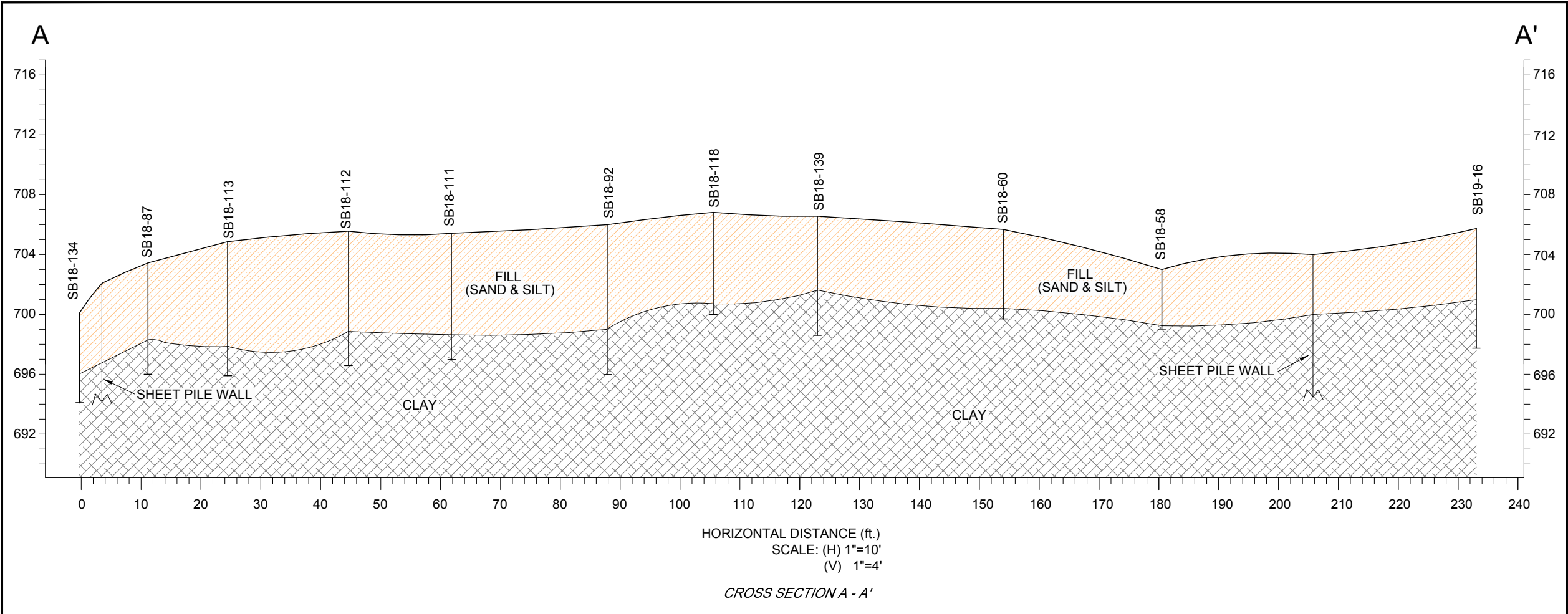
- MW19-18 MONITORING WELL LOCATION
- SB18-111 SOIL BORING LOCATION
- A—A' CROSS SECTION LOCATION
- SHEET PILE WALL
- STORM SEWER LINE
- X — FENCE
- SEWER LINE PLUG
- TOS TOP OF SHEET PILE ELEVATION ABOVE MEAN SEA LEVEL
- BOS BOTTOM OF SHEET PILE ELEVATION ABOVE MEAN SEA LEVEL
- M.H. MANHOLE
- U.P. UTILITY POLE

SCALE VERIFICATION	
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.	

Approved	
DRAWING STATUS	
RECORD DRAWINGS	1-14-05 FWB
Status	Date Initial

FORMER WILLOW RUN ASSEMBLY PLANT YPSILANTI, MICHIGAN	
CONSTRUCTION COMPLETION REPORT	
LOCATION OF SHEET PILE WALL COMPANY VEHICLE OPERATIONS	

CRA ENGINEERING, INC.			
Source Reference:			
Project Manager:	Reviewed By:	Date:	
F.B.	B.H.	DECEMBER, 2004	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
AS SHOWN	17303-10	009	G-2

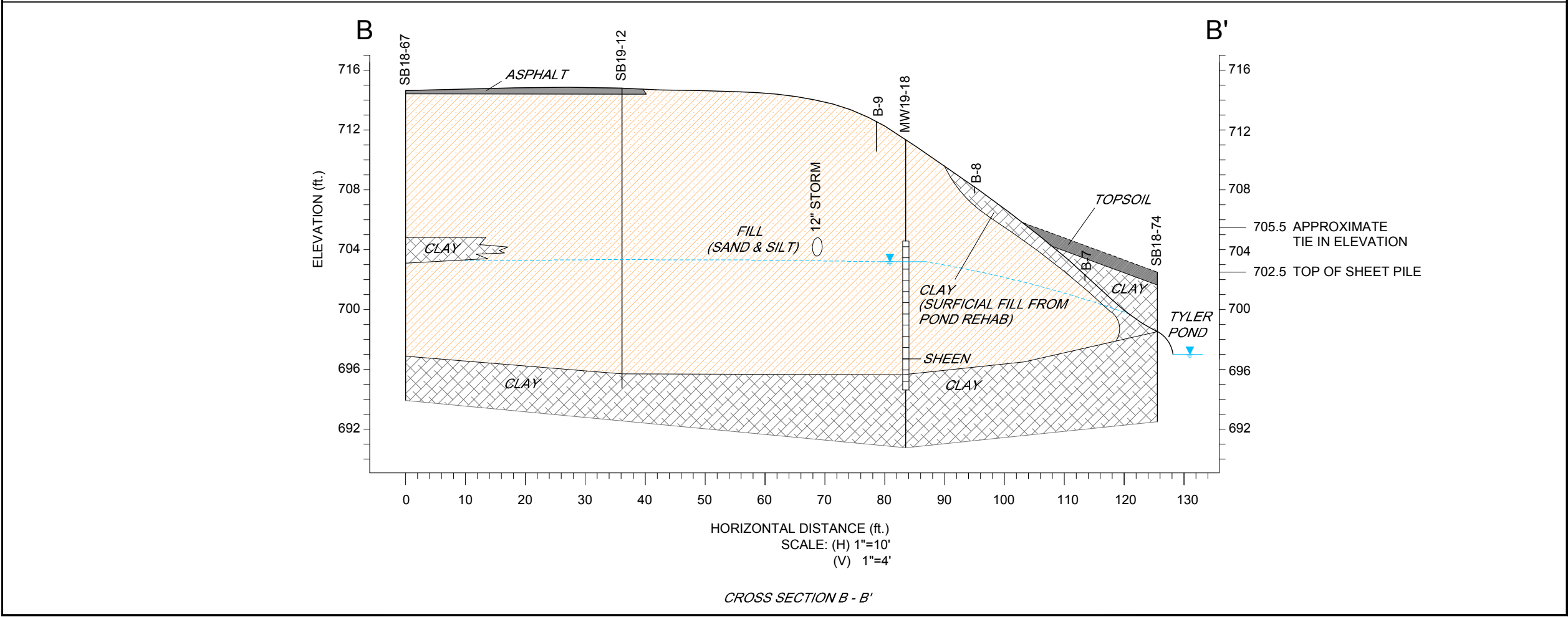


No.	Revision	Date	Initial

LEGEND

- BOREHOLE/WELL IDENTIFICATION NUMBER
- GROUND SURFACE
- SCREENED INTERVAL
- STATIC WATER LEVEL
- STRATIGRAPHIC DESCRIPTION
- STRATIGRAPHIC CONTACT

GROUNDWATER ELEVATIONS ESTIMATED FROM MAY 2004 OBSERVATIONS



SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

RECORD DRAWINGS	1-14-05	FWB
Status	Date	Initial

FORMER WILLOW RUN ASSEMBLY PLANT
YPSILANTI, MICHIGAN

CONSTRUCTION COMPLETION REPORT

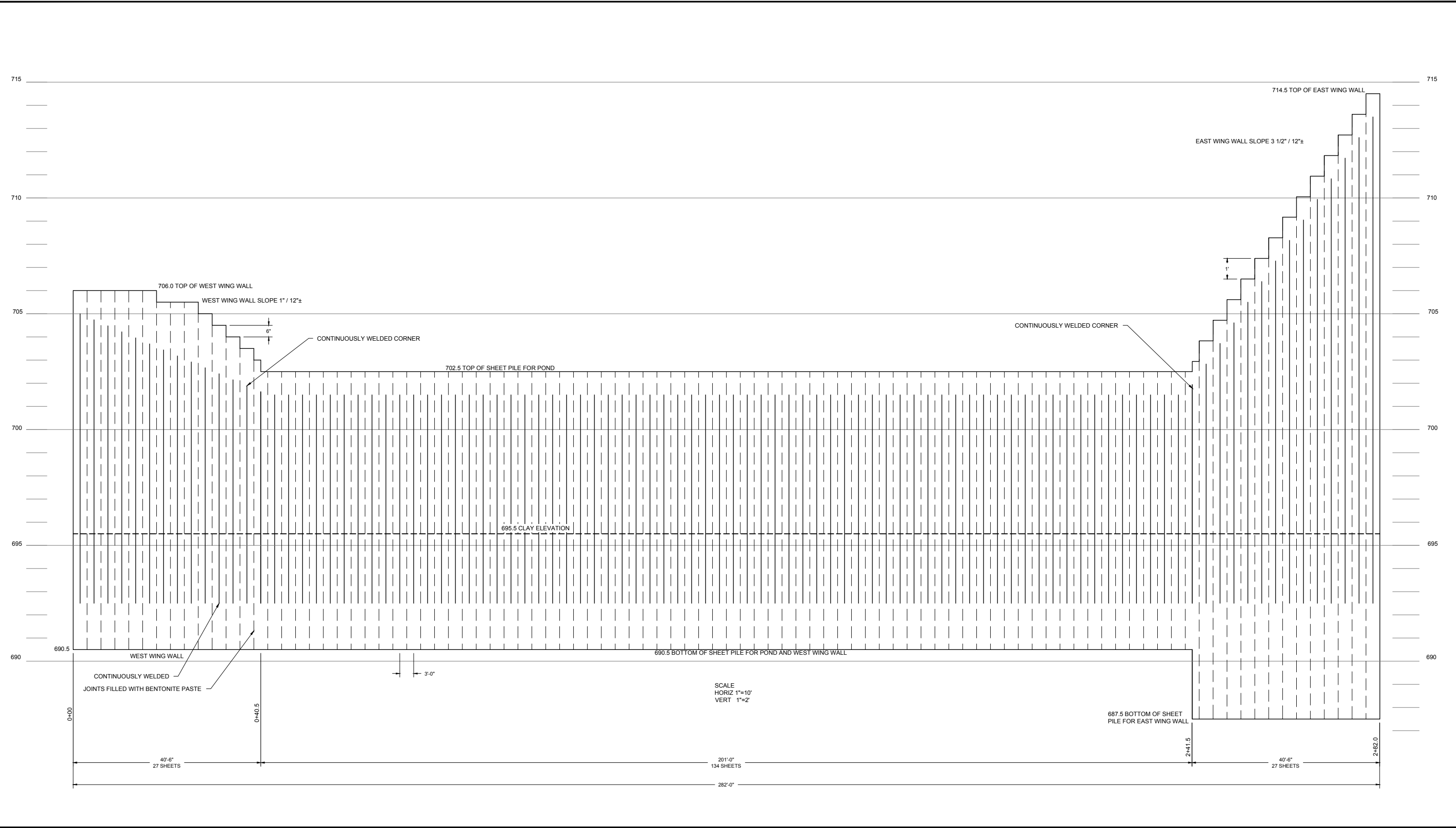
CROSS SECTIONS
COMPANY VEHICLE OPERATIONS

CRA ENGINEERING, INC.

Source Reference:

Project Manager:	Reviewed By:	Date:
F.B.	B.H.	DECEMBER, 2004

Scale:	Project No:	Report No:	Drawing No:
AS SHOWN	17303-10	009	G-3



NOTE
THESE PILES HAVE BEEN LAID OUT BASED ON THE SHEET
PILE WIDTH OF 18"

SCALE VERIFICATION: THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.			
No	Revision	Date	Initial

Approved	

FORMER WILLOW RUN ASSEMBLY PLANT YPSILANTI, MICHIGAN
COMPANY VEHICLE OPERATIONS
SHEET PILE PROFILES AND WING WALLS

			CRA ENGINEERING, INC.	
Source Reference:			Date: OCT 2004	
Project Manager: FWB	Reviewed By: FWB	Designed By: MG	Drawn By: ER	
Scale: AS SHOWN	Project No: 17303-10	Report No: 009	Drawing No: FIG G-4	

APPENDIX B

SUBMITTALS AND SUBMITTAL LOG

SUBMITTAL LOG

CONTRACT FOR: Consetoga-Rovers and Associates and Inc.

CONTRACT NO.: _____

OWNER: General Motors Corporation

CONTRACTOR: _____

Note all dates are Month-day-year

Spec Section No.	New Sub	Re sub mit	Item Description	Submittal No.	CRA				Action						
					Date Rec'd	To	Date Sent	Date Returned	Approved	Approved As Noted	Not Subject To Review	No Action Required	Revise/ Resubmit	Reject/ Resubmit	Appr oved As Noted / Resub mit
	x		Sheet Piling Specs	017303-001	10-1-04	M. Gentner	10-1-04	10-4-04		X (asked to specify steel grade)					
	x		H&S Letter and Certificates	017303-002	10-6-04	B. Landale	10-6-04	10-6-04					X		
	x		Subcontractor Pre-Qual Form	017303-002	10-6-04	B. Landale	10-6-04						X (addition al info needed)		
		x	H&S Letter and Missing certificate	017303-002	10-12-04	B. Landale	10-14-04	10-14-04	X						
	x		Clay Backfill Source	017303-003	10-13-04	B. Landale	10-14-04	10-14-04	X						
		x	Subcontractor Pre-Qual Form – add info	017303-002	10-20-04	B. Landale	10-20-04	10-22-04	X						
	x		Top Soil Source	017303-004	10-22-04	F. Blickle	10-22-04	10-22-04						X	
		x	Top Soil Source	017303-004A	11-12-04	B. Landale	11-12-04	11-12-04	X						



**CONESTOGA-ROVERS
& ASSOCIATES**

4141 Davis Creek Court
Kalamazoo, Michigan 49001-0838
Telephone: (269) 344-1230 Fax: (269) 344-8558
www.CRAworld.com

TRANSMITTAL

DATE: 10/06/04

REFERENCE NO.: 017303.10.20

PROJECT NAME:

Former Willow Run Assembly/ CVO
Facility

TO:

Beth Landale

Conestoga-Rovers and Associates, Inc.

1880 Assumption Street

Windsor, Ontario N8Y1C4, Canada

Phone: (519)-966-9886 FAX:

Please find enclosed:

☐

Draft

☐

Originals

☐

Prints

☐

Final

☒

Other

Submittal 017303-002

Sent via:

☐

Mail

☐

Overnight Courier

☐

Same Day Courier

☒

Other

PDF

QUANTITY	DESCRIPTION
1	Hardman letter regarding health and safety (1-page)
1	Key personnel Fit to work non-injury status report (4-pages)
1	HAZWOPER 8-hour refresher certificates (4-pages)
1	Sub-contractor prequalification form (12-pages)

SUBMITTAL REVIEW

☐

As Requested

☐

For Your Use

☒

For Review and Comment

☐☐

This review is for the sole purpose of ascertaining conformance with the general design concept, and in no way constitutes approval of the detail design inherent in the shop drawings, responsibility for which remains with the contractor submitting same.

☒ REVIEWED *changes submitted/ok'd*

☐ REVISE AS NOTED *ok*

☐ REVISE AND RESUBMIT

SUBMISSION NO. 002

PROJECT NO. 17303

BY Beth Landale

DATE 10-22-04

COMMENTS:

Attached submittal for your review and approval

CONESTOGA - ROVERS & ASSOCIATES

Copy to:

Correspondence File

Completed by:

Matthew S. Abdallah

[Please Print]

Signed:

Matthew S. Abdallah

242 South Brye Road
Ludington, MI 49431



Phone (231) 845-1236
FAX (231) 845-0422

September 30, 2004

CONESTOGA-ROVERS & ASSOCIATES
14496 Sheldon Road, Suite #200
Plymouth, MI 48170

Attention: Matt Abdullah

RE: Tyler Pond – Willow Run

Dear Matt:

In regards to the Tyler Pond Project, Hardman Construction, Inc. will abide by CRA Services Health and Safety Plan for the duration of this project.

If you require anything further, please do not hesitate to call.

Very truly yours,
HARDMAN CONSTRUCTION, INC.



Ted C. Kroeze, Project Manager

CC: Scott Mitchell, Supt.
1089 C

**EMERGENCY
ERC RESPONSE
CONSULTING
INC.**

Certificate of Training

This certifies that

Greg Mitchell

has successfully completed **8** hours of instruction in

**HANDLING HAZARDOUS MATERIALS - REFRESHER
per 29 CFR 1910.120**

Prepared and conducted by Emergency Response Consulting, Inc.

Ron Kuhn

Trainer

April 2, 2004

Date of Completion

Emergency Response Consulting, Inc., is an emergency response training company located in Ludington, Michigan specializing in firefighting and hazardous materials consulting and training.

**EMERGENCY
RESPONSE
ERC CONSULTING
INC.**

Certificate of Training

This certifies that

Jerry Starky

has successfully completed **8** hours of instruction in

**HANDLING HAZARDOUS MATERIALS - REFRESHER
per 29 CFR 1910.120**

Prepared and conducted by Emergency Response Consulting, Inc.

Ron Kisor

Trainer

April 2, 2004

Date of Completion

Emergency Response Consulting, Inc., is an emergency response training company located in Ludington, Michigan specializing in firefighting and hazardous materials consulting and training.

**EMERGENCY
RESPONSE
ERC CONSULTING
INC.**

Certificate of Training

This certifies that

Scott Mitchell

has successfully completed **8** hours of instruction in

**HANDLING HAZARDOUS MATERIALS - REFRESHER
per 29 CFR 1910.120**

Prepared and conducted by Emergency Response Consulting, Inc.

Ross Kuntz

Trainer

April 2, 2004

Date of Completion

Emergency Response Consulting, Inc., is an emergency response training company located in Ludington, Michigan specializing in firefighting and hazardous materials consulting and training.

**EMERGENCY
ERC RESPONSE CONSULTING
INC.**

Certificate of Training

This certifies that

Doug Sharp

8

has successfully completed hours of instruction in

**HANDLING HAZARDOUS MATERIALS - REFRESHER
per 29 CFR 1910.120**

Prepared and conducted by Emergency Response Consulting, Inc.

Ross Kinnor

Trainer

April 2, 2004

Date of Completion

Emergency Response Consulting, Inc., is an emergency response training company located in Ludington, Michigan specializing in firefighting and hazardous materials consulting and training.

Claim Number:

Concentra Medical Centers (MI)

28196 Schoolcraft Livonia, MI 48150
Phone: (734) 425-4600 Fax: (734) 425-1185

Service Date: 05/19/2004

Non-Injury Status Report

Patient: Mitchell, Gregory

SSN: 374-72-4823

Address: P.O Box 152
REED CITY, MI 49677

Home: (231) 846-0487

Work: Ext.:

Employer Location: Hardman Construction Inc

Address: 242 South Brye Rd
Ludington, MI 49431

Auth. by:

Contact: Bill Lynn

Role: Office Manager

Phone: (616) 845-1236 Ext.: 3227

Fax: (616) 845-0422

This Visit:

Time In: 05:50 pm

Time Out: 08:19 pm

Visit Type: New

Baseline Physical

CBC w/diff

Chem 25

Chest X-ray 1 view

DIP/TET

Non Regulated UDS

Physicals - Pre-Placement

Pulmonary Function Test

Respirator Questionnaire Review

U/A Gross

Audiogram

Result Status:

No medical restrictions

Remarks:

Claim Number:

Concentra Medical Centers (MI)

28196 Schoolcraft Livonia, MI 48150
Phone: (734) 425-4600 Fax: (734) 425-1185

Service Date: 05/19/2004

Non-Injury Status Report

Patient: Starkey, Jerry

SSN: 384-68-1725

Address: 11199 South 200th
LEROY, MI 49655

Home: (231) 832-2695

Work: Ext.:

Employer Location: Hardman Construction Inc
Address:

242 South Brye Rd
Ludington, MI 49431

Auth. by:

Contact: Bill Lynn

Role: Office Manager

Phone: (616) 845-1236 Ext. 3227

Fax: (616) 845-0422

This Visit:

Time In: 05:50 pm

Time Out: 08:25 pm

Visit Type: New

Baseline Physical

Physicals - Pre-Placement

Pulmonary Function Test

Respirator Questionnaire Review

U/A Gross

Audiogram

CBC w/diff

Chem 25

Chest X-ray 1 view

Non Regulated UDS

Result Status:

No medical restrictions

Remarks:

Claim Number:

Concentra Medical Centers (MI)

28196 Schoolcraft Livonia, MI 48150
Phone: (734) 425-4800 Fax: (734) 425-1185

Service Date: 05/19/2004

Non-Injury Status Report

Patient: Brown, David P.

SSN: 378-90-1551

Address: 14409 Oakleaf Tr
LINDEN, MI 48451

Home: (810) 735-5136

Work: Ext.:

Employer Location: Hardman Construction Inc
Address:

242 South Brye Rd
Ludington, MI 49431

Auth. by:

Contact: Bill Lynn

Role: Office Manager

Phone: (616) 845-1236 Ext. 3227

Fax: (616) 845-0422

This Visit:

Time In: 05:50 pm

Time Out: 07:31 pm

Visit Type: New

Baseline Physical

CBC w/diff

Chem 25

Chest X-ray 1 view

Non Regulated UDS

Physicals - Pre-Placement

Pulmonary Function Test

Respirator Questionnaire Review

U/A Gross

Audiogram

Result Status:

No medical restrictions

Remarks:

Claim Number:

Concentra Medical Centers (MI)

28196 Schoolcraft Livonia, MI 48150
Phone: (734) 425-4800 Fax: (734) 425-1185

Service Date: 05/19/2004

Non-Injury Status Report

Patient: Mitchell, Scott

SSN: 374-72-2820

Address: 13075 Sugarbush
LEROY, MI 49655

Home: (231) 768-4777

Work: Ext.:

Employer Location: Hardman Construction Inc
Address:

242 South Brye Rd
Ludington, MI 49431

Auth. by:

Contact: Bill Lynn

Role: Office Manager

Phone: (616) 845-1236 Ext.: 3227

Fax: (616) 845-0422

This Visit:

Time In: 05:50 pm

Time Out: 08:27 pm

Visit Type: New

Baseline Physical

Physicals - Pre-Placement

Pulmonary Function Test

Respirator Questionnaire Review

U/A Gross

CBC w/diff

Chem 25

Chest X-ray 1 view

DIP/TET

Non Regulated UDS

Audiogram

Result Status:

No medical restrictions

Remarks:

242 South Brye Road
Ludington, MI 49431

HARDMAN



CONSTRUCTION, INC.

Phone (231) 845-1236
FAX (231) 845-0422

RECEIVED

September 29, 2004

SEP 30 2004

CRA SERVICES
4141 Davis Creek Court
Kalamazoo, MI 49001

CRA, INC.

Attention: Wayne Bauman

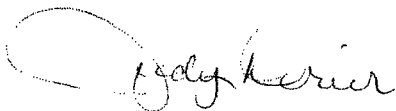
RE: Tyler Pond – Willow Run

Dear Wayne:

Enclosed for your review is our Subcontractor Pre-qualification with attachments. Please call me if you have questions or need clarification on any of the attached. Thank you.

Sincerely,

HARDMAN CONSTRUCTION, INC.



Judy Drier, Secretary

jd

SUBCONTRACTOR PRE-QUALIFICATION FORM **PART 1**

SUBMIT COMPLETED FORM
TO:

FIRM NAME/BUSINESS ADDRESS: HARDMAN CONSTRUCTION, INC.
242 South Brye Road
Ludington, MI 49431

PRINCIPAL OFFICE ADDRESS: Same

TYPE OF OWNERSHIP: Corporation Partnership Individual ☐ Other ☒
S-CORPORATION

TYPE OF SERVICE (file separate form for each Type of Service):

Drilling ☐ Surveying ☐ Analytical ☐ Consulting ☐

☒ Other (please specify) Construction

CONTACT PERSONS: Ted Kroeze

Names of no more than two principals to contact:

	Name	Title	Telephone No.
1.	<u>Bruce A. Lowing</u>	<u>President</u>	<u>231-845-1236</u>
2.	<u>Todd M. Schrader</u>	<u>Engineer/P.M.</u>	<u>231-845-1236</u>

IDENTIFICATION/CERTIFICATION: I certify that the information provided herein is true and sufficiently complete so as not to be misleading.

Signature: William Lynn : Date 09-29-04

Typed Name and Title: William Lynn, Office Manager/Safety Officer

Approved by: _____
Contracts Manager/Date Technical Representative/Date

**VENDOR PRE-QUALIFICATION FORM
PART 2****1. ORGANIZATION:**

1.1 How many years has your organization been in business as a provider of the Type of Service?

25 Years

1.2 How many years has your organization been in business under its present name?

25 Years

1.2.1 Under what other or former names has your organization operated?

N/A

1.3 What is the name of your parent company, if any?

N/A

1.4 Attach a copy of your corporate organizational chart.

1.5 If your organization is a corporation, answer the following:

Date of incorporation:

January 17, 1979

State/Province of
incorporation:

Michigan - USA

President's Name:

Bruce A. Lowing

~~VP~~ Name(s): C.E.O.

Al Hardman

Secretary's Name:

Carole J. Hardman

Treasurer's Name:

Carole J. Hardman

1.6 If your organization is a partnership, answer the following:

Date of organization:

Type of partnership (if applicable):

Name(s) of general partner(s):

1.7 If your organization is individually owned, answer the following:

Date of organization:

Name of owner:

1.8 If the form of your organization is other than those listed above, describe it and name the principals.

2. LICENSING:

- 2.1 List jurisdictions in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

Pre-Qualified - Michigan, INdiana and Wisconsin

- 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

3. EXPERIENCE:

- 3.1 List the categories of work that your organization normally performs with its own forces.

Heavy Construction

Bridges

Sewer

Augercast Piling

Sheet Piling - Earth Retention

- 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

None

3.2.1 Has your organization failed to complete any work awarded to it?
No ☒ Yes ☐

3.2.2 Are there any judgments, claims, arbitration proceedings, or suits pending or outstanding against your organization or its officers?
No ☒ Yes ☐

3.2.3 Has your organization filed any law suits or requested arbitration with regard to contracts within the last 5 years?
No ☒ Yes ☐

3.3 Within the last 5 years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a contract? (if the answer is yes, please attach details.)
No

3.4 On a separate sheet, list major projects your organization has in progress, giving the name of project, owner, your customer, contract amount, percent complete, and scheduled completion date.

See attached 1300 Form (1 page)

3.5 On a separate sheet, list the major projects your organization has completed in the past 5 years, giving the name of project, owner, your customer, contract amount, date of completion, and percentage of cost of the work performed with your own forces.

85% of our work is completed by our own forces.
See attached job lists.

3.5.1 State average annual amount of work performed during the past 5 years:
\$26,733,697.00

3.6. Provide the following documentation of your Health and Safety Program:
a. Written Health and Safety Plan
b. Health and Safety Performance Record
c. Name and qualifications for Company Health and Safety Officer/designated person

Please see attached

4. FINANCIAL REFERENCES:**4.1 Bank References:**National City Bank130 East Ludington AvenueLudington, MI 49431Contact: Daniel Sleeman Phone: 231-845-5155**4.2 Surety References**ITT Hartford2401 West Big Beaver RoadTroy, MI 48007Contact: Douglas F. Burgher Phone: 1-800-872-8303

5. FINANCING:**5.1 Financial Statement**

5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

- Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory, and prepaid expenses)
- Net Fixed Assets
- Other Assets
- Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries, and accrued payroll taxes)
- Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings)

5.1.2 Name and address of firm preparing financial statement, and date thereof:

Brickley DeLong, PC
P.O. Box 999
Muskegon, MI 49443

5.1.3 Is the attached financial statement for the identical organization named on page 1? If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidary).

Yes

- 5.2 Will the organization whose financial statement is attached act as guarantor of a contract for providing services to REALM / ENCORE?

Yes

6. **INSURANCE**

On a separate sheet list evidence of current insurance carried including type of insurance, policy number, policy effective/expiration date, limits, name of carrier, name and address of broker/agent, or attach Certificate of Insurance with equal evidence.

See attached

7. **FORM OF SUBCONTRACT**

- 7.1 Will your firm enter into the attached Master Agreement without exceptions? SEE ATTACHED EXAMPLE COPY.

No ☐

Yes ☒

8. **BRANCH OFFICES**

- 8.1 On a separate sheet, list office locations, including address, phone/fax numbers, and office manager.

n/a

ACORD

CERTIFICATE OF LIABILITY INSURANCE

CSR GE
HARDM-1

DATE (MM/DD/YYYY)

03/31/04

PRODUCER

Lenz & Associates, Inc.
201 East Court Street
P.O. Box 250
Ludington MI 49431-0250
Phone: 231-845-6279 Fax: 231-845-5188

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION
ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE
HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR
ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED

Hardman Construction
Bill Lynn
242 S Brye Rd
Ludington MI 49431

INSURERS AFFORDING COVERAGE

NAIC #

INSURER A: Hartford Insurance

19682

INSURER B: RSUI Indemnity

INSURER C:

INSURER D:

INSURER E:

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR ADD'L LTR INSR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	CONSTANT LIMITS
A	☒ GENERAL LIABILITY ☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO- JECT ☐ LOC	81UENOC1551	03/01/04	03/01/05	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000 Emp Ben. 1,000,000
A	☒ AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ ALL OWNED AUTOS ☐ SCHEDULED AUTOS ☒ HIRED AUTOS ☒ NON-OWNED AUTOS	81UENOC1552	03/01/04	03/01/05	COMBINED SINGLE LIMIT (Ea accident) \$ 1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$
	☐ GARAGE LIABILITY ☐ ANY AUTO				AUTO ONLY - EA ACCIDENT \$ OTHER THAN EA ACC \$ AUTO ONLY: AGG \$
B	☒ EXCESS/UMBRELLA LIABILITY ☒ OCCUR ☐ CLAIMS MADE ☐ DEDUCTIBLE ☒ RETENTION \$10,000	P2HN020478	03/01/04	03/01/05	EACH OCCURRENCE \$ 5,000,000 AGGREGATE \$ 5,000,000 \$ \$ \$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? If yes, describe under SPECIAL PROVISIONS below OTHER	81WE0C1559	03/01/04	03/01/05	☒ WC STATU- TORY LIMITS ☐ OTH- ER E.L. EACH ACCIDENT \$ 500,000 E.L. DISEASE - EA EMPLOYEE \$ 500,000 E.L. DISEASE - POLICY LIMIT \$ 500,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES / EXCLUSIONS ADDED BY ENDORSEMENT / SPECIAL PROVISIONS

Verification of insurance coverage as Additional Insured for certificate holder shown below.

CERTIFICATE HOLDER

CANCELLATION

CRA SAMPLE

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Marc Lenz

FORM 1300 - OCTOBER 1, 2004									
JOB NUMBER	PROJECT NAME	CONTRACT NUMBER	CONTRACT AMOUNT	ESTIMATE NUMBER	ESTIMATE DATE	CONTRACT EARNED TO DATE	PRIME CONTRACTOR UNCOMPLETED	SUB-CONTRACTORS WORK (UNCOMPLETED)	(HCl) TOTAL UNCOMPLETED CONTRACT AMOUNT
1045	M115 Over Betsie River	ASTT 10042 - 58888A	1,018,840.58	12	8/27/2004	887,748		SECTION # 2	SECTION # 1
1047	I94 Over Red Arrow Highway	ANH 11015 - 50782A	5,856,641.89	13	8/24/2004	3,551,091	131,092	120,364	10,728
1054	Reek Road over PM River	53003 - 59774A	658,320.32	7	8/31/2004	616,426	2,305,551	835,666	1,469,885
1055	Bridge over Tiltabawasse River	73404 - 50191A	2,744,663.10	8	8/16/2004	1,195,623	41,894	23,331	18,563
1056	Lilac Road over St. Joseph Manumee	30004 - 56509A	772,418.11	9	8/23/2004	500,084	1,549,040	963,682	585,358
1083	RR Track - Grand Traverse County	28004 - 80139	108,954.00	0			272,334	16,760	255,574
1085	M-47 at the Freeland Drain	73073 - 40402	163,798.13	0			108,954		108,954
							163,798	2,620	161,178
TOTALS			11,323,636			6,760,973	4,572,664	1,959,803	2,449,062
SUB-CONTRACTS									
TOTALS									
GRAND TOTALS			11,323,636			6,760,973	4,572,664	1,959,803	2,449,062

From: Landale, Beth
Sent: Tuesday, October 05, 2004 10:33 AM
To: Filing
Subject: FW: 017303_submittal01 approval

From: Gentner, Michael
Sent: October 4, 2004 3:24 PM
To: Landale, Beth
Subject: RE: 017303_submittal01

AZ18 approved. Have them specify which grade of steel they are using for the record.

-----Original Message-----

From: Landale, Beth
Sent: Friday, October 01, 2004 12:21 PM
To: Gentner, Michael
Subject: FW: 017303_submittal01

Hi Mike,
Attached is the sheet pile submittal.
Can you please review this and approve it.
Thanks,
Beth

From: Abdallah, Matthew
Sent: October 1, 2004 10:18 AM
To: Landale, Beth
Subject: 017303_submittal01

<< File: sub001.pdf >>

Sincerely,

*Matthew S. Abdallah
CRA Services the construction division of CRA Inc.
14496 Sheldon Road Suite 200
Plymouth, MI 48170
Fax- 734-453-5201
Work: 734-453-5123
Cell: 248-361-0578*



**CONESTOGA-ROVERS
& ASSOCIATES**

4141 Davis Creek Court
Kalamazoo, Michigan 49001-0838
Telephone: (269) 344-1230 Fax: (269) 344-8558
www.CRAworld.com

TRANSMITTAL

DATE: 10/01/04 REFERENCE NO.: 017303.10.20
PROJECT NAME: Former Willow Run Assembly/ CVO Facility

TO: Beth Landale
Conestoga-Rovers and Associates, Inc.
1880 Assumption Street
Windsor, Ontario N8Y1C4, Canada
Phone: (519)-966-9886 FAX:

Please find enclosed: ☐ Draft ☐ Final 017303-001
☐ Originals ☒ Other Submittal 017303-001
☐ Prints

Sent via: ☐ Mail ☐ Same Day Courier
☐ Overnight Courier ☒ Other Fascimile

QUANTITY	DESCRIPTION
1	AZ-18 Hot Rolled Steel Sheetpiling

☐ As Requested ☒ For Review and Comment
☐ For Your Use ☐
☐

COMMENTS:

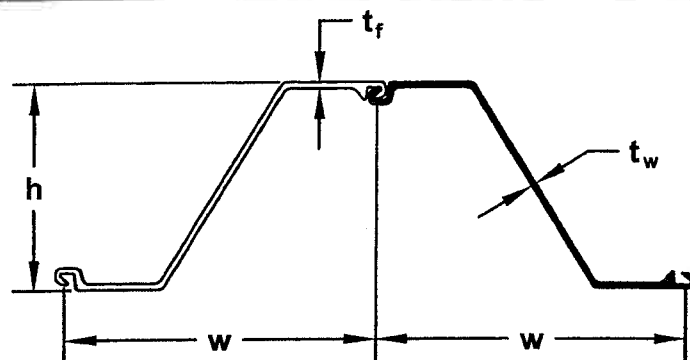
Attached submittal for your review and approval

Copy to: Correspondence File

Completed by: Matthew S. Abdallah

[Please Print]

Signed: 



AZ Hot Rolled Steel Sheet Piling

SECTION	Width (w) in (mm)	Height (h) in (mm)	THICKNESS		WEIGHT		Section Modulus in ³ /ft (cm ³ /m)	Moment of Inertia in ⁴ /ft (cm ⁴ /m)	COATING AREA	
			Flange (t _f) in (mm)	Web (t _w) in (mm)	Pile lb/ft (kg/m)	Wall lb/ft ² (kg/m ²)			Both Sides ft ² /ft of single (m ² /m)	Wall Surface ft ² /ft ² (m ² /m ²)
AZ 12	26.38 670	11.89 302.0	0.335 8.50	0.335 8.50	44.42 66.10	20.22 98.70	22.3 1200	132.8 18140	5.45 1.66	1.23 1.23
AZ 13	26.38 670	11.93 303.0	0.375 9.50	0.375 9.50	48.38 72.00	22.02 107.5	24.2 1300	144.3 19700	5.45 1.66	1.23 1.23
AZ 14	26.38 670	11.97 304.0	0.413 10.50	0.413 10.50	52.62 78.30	23.94 116.90	26.0 1400	156.0 21300	5.45 1.66	1.23 1.23
AZ 17	24.80 630	14.92 379.0	0.335 8.50	0.335 8.50	45.96 68.40	22.24 108.60	31.0 1665	231.3 31580	5.64 1.72	1.35 1.35
AZ 18	24.80 630	14.96 380.0	0.375 9.50	0.375 9.50	49.99 74.40	24.19 118.10	33.5 1800	250.4 34200	5.64 1.72	1.35 1.35
AZ 19	24.80 630	15.00 381.0	0.413 10.50	0.413 10.50	54.43 81.00	26.34 128.60	36.1 1940	270.8 36980	5.64 1.72	1.35 1.35
AZ 25	24.80 630	16.77 426.0	0.472 12.00	0.441 11.20	61.49 91.50	29.74 145.20	45.7 2455	382.6 52250	5.91 1.80	1.41 1.41
AZ 26	24.80 630	16.81 427.0	0.512 13.00	0.480 12.20	65.72 97.80	31.79 155.20	48.4 2600	406.5 55510	5.91 1.80	1.41 1.41
AZ 28	24.80 630	16.85 428.0	0.551 14.00	0.520 13.20	70.15 104.40	33.94 165.70	51.2 2755	431.6 58940	5.91 1.80	1.41 1.41
AZ 34	24.80 630	18.07 459.0	0.669 17.00	0.512 13.00	77.61 115.50	37.54 183.30	63.8 3430	576.3 78700	6.10 1.86	1.47 1.47
AZ 36	24.80 630	18.11 460.0	0.709 18.00	0.551 14.00	82.11 122.20	39.73 194.00	67.0 3600	606.3 82800	6.10 1.86	1.47 1.47
AZ 38	24.80 630	18.15 461.0	0.748 19.00	0.591 15.00	86.75 129.10	41.97 204.90	70.3 3780	637.7 87080	6.10 1.86	1.47 1.47
AZ 46	22.83 580	18.94 481.0	0.709 18.00	0.551 14.00	89.10 132.60	46.82 228.60	85.5 4595	808.8 110450	6.23 1.90	1.63 1.63
AZ 48	22.83 580	18.98 482.0	0.748 19.00	0.591 15.00	93.81 139.60	49.28 240.60	89.3 4800	847.1 115670	6.23 1.90	1.63 1.63
AZ 50	22.83 580	19.02 483.0	0.787 20.00	0.630 16.00	98.58 146.70	51.80 252.90	93.3 5015	886.5 121060	6.23 1.90	1.63 1.63





ARBED AZ HOT-ROLLED SHEET PILES REPLACING PZ 40, PZ 35, PZ 27

Sections	Geometrical dimensions				Physical properties				Bending moment capacities (at allowable working stress = 0.667 · nominal yield strength)								Weight %
	Width (in) (mm)	Height (in) (mm)	Web thickness (in) (mm)	Flange thickness (in) (mm)	Section modulus (in ³ /ft) (cm ³ /m)	Moment of inertia (in ⁴ /ft) (cm ⁴ /m)	Weight per angle (lb/ft) (kg/m)	Weight per wall (lb/ft) (kg/m)	A328 (270) (ft-kips/ft) (kNm/m)	A572 Gr42 (290) (ft-kips/ft) (kNm/m)	A572 Gr50 (345) (ft-kips/ft) (kNm/m)	A572 Gr55 (380) (ft-kips/ft) (kNm/m)	A572 Gr60 (414) (ft-kips/ft) (kNm/m)	A572 Gr65 (448) (ft-kips/ft) (kNm/m)			
PZ 40	19.89 500	18.10 459	0.500 12.7	0.600 15.2	60.7 3383	490.85 87029	85.60 97.6	40.00 195.3	131.50 587	114.61 531	168.59 750	188.45 837	202.31 901	219.16 973			100.00
AZ 38	24.81 630	18.15 457	0.594 15.1	0.752 19.1	70.8 3905	842.01 87670	87.42 130.1	42.29 208.8	153.42 685	165.22 734	196.69 876	216.36 964	236.03 1051	255.70 1137			105.73
AZ 36 ru .04" (-1.0 mm)	24.81 630	18.15 457	0.591 15.0	0.748 19.0	70.3 3778	837.7 87080	86.75 120.1	41.97 204.9	152.33 680	164.05 731	195.29 869	214.82 958	234.35 1043	253.88 1139			104.98
AZ 36 rd .02" (-0.5 mm)	24.81 630	18.13 456.5	0.571 14.5	0.728 18.5	68.6 3689	822.0 84940	84.47 125.7	40.86 198.8	148.74 664	160.18 714	190.89 849	208.76 934	228.85 1019	247.80 1108			102.15
AZ 36	24.81 630	18.11 456	0.551 14.0	0.709 18.0	67.0 3600	806.3 82800	82.11 122.2	39.73 194.0	145.15 648	156.32 696	186.09 828	204.70 912	223.31 994	241.92 1076			99.38
AZ 36 rd .02" (-0.5 mm)	24.81 630	18.09 455.5	0.531 13.6	0.689 17.5	65.4 3516	591.3 80750	79.83 118.9	38.63 188.0	141.73 633	152.63 680	181.70 809	199.87 897	218.04 971	238.21 1050			96.58
AZ 36 rd .04" (-1.0 mm)	24.81 630	18.07 455	0.512 13.0	0.669 17.0	63.8 3489	576.3 78700	77.81 115.5	37.54 182.7	138.26 619	148.89 663	177.25 789	194.98 869	212.70 947	230.43 1035			93.85
AZ 28 ru .04" (-1.0 mm)	24.81 630	16.85 428	0.520 13.2	0.551 14.0	81.2 431.6	431.6 58448	70.16 104.4	33.94 155.7	111.04 498	119.88 539	142.36 634	158.60 694	170.83 760	188.07 839			84.85
AZ 28 ru .02" (-0.5 mm)	24.81 630	16.83 427.5	0.500 12.7	0.531 13.6	49.6 2685	417.1 58448	67.87 104.4	32.75 155.7	107.45 480	115.72 515	137.76 613	151.54 673	165.31 738	179.09 798			81.88
AZ 28	24.81 630	16.81 427	0.480 12.2	0.512 13.0	48.4 2600	406.5 55810	65.72 97.8	31.75 155.0	104.83 468	112.80 503	134.40 599	147.84 659	161.28 718	174.72 777			79.38
PZ 35	22.84 575	14.90 378	0.500 12.7	0.600 15.2	48.4 2600	361.22 49820	66.00 98.2	35.00 170.8	105.10 468	113.18 504	134.75 600	148.22 661	161.7 720	176.17 778			100.00
AZ 28	24.81 630	16.81 427	0.480 12.2	0.512 13.0	48.4 2600	406.5 55810	65.72 97.8	31.75 155.0	104.83 468	112.80 503	134.40 599	147.84 659	161.28 718	174.72 777			90.71
AZ 28 ru .04" (-1.0 mm)	24.81 630	16.85 428	0.520 13.2	0.551 14.0	51.2 2754	431.6 58448	70.16 104.4	33.94 155.7	111.04 498	119.88 539	142.36 634	158.60 694	170.83 760	188.07 839			96.97
AZ 28 ru .02" (-0.5 mm)	24.81 630	16.83 427.5	0.500 12.7	0.531 13.6	49.6 2685	417.1 58448	67.87 104.4	32.75 155.7	107.45 480	115.72 515	137.76 613	151.54 673	165.31 738	179.09 798			94.00
AZ 28 rd .02" (-0.5 mm)	24.81 630	16.79 426.5	0.461 11.7	0.492 12.5	47.2 2598	398.3 54120	63.84 95.0	30.89 150.8	102.33 457	110.20 497	131.20 584	144.32 643	157.45 701	170.55 758			88.28
AZ 28 rd .04" (-1.0 mm)	24.81 630	16.77 426	0.441 11.3	0.472 12.0	45.6 2453	382.6 52280	61.48 91.8	29.74 145.2	98.91 442	106.51 474	126.80 561	139.48 622	152.16 677	164.84 733			84.97
AZ 18 ru .04" (-1.0 mm)	24.81 630	15.00 381	0.413 10.5	0.413 10.5	36.1 1941	870.8 36980	54.43 81.0	26.34 128.8	78.28 350	84.28 378	100.34 447	110.87 488	120.40 536	130.44 580			75.26
AZ 18 ru .02" (-0.5 mm)	24.81 630	14.98 380.5	0.394 10.0	0.394 10.0	34.8 1858	258.9 35350	52.07 77.4	25.15 122.8	74.81 335	80.68 369	96.04 428	105.65 471	115.28 513	124.96 555			71.86
AZ 18	24.81 630	14.96 380	0.375 9.5	0.375 9.5	33.5 1800	250.4 34200	49.99 74.4	24.17 118.0	72.58 324	78.18 348	93.05 414	102.85 458	111.88 497	120.96 538			69.06
AZ 18 rd .02" (-0.5 mm)	24.81 630	14.94 379.5	0.354 9.0	0.354 9.0	32.5 1748	242.9 33170	48.25 71.8	23.36 114.0	70.48 315	75.90 338	90.88 402	99.39 443	108.43 483	117.47 522			66.71
AZ 18 rd .04" (-1.0 mm)	24.81 630	14.92 379	0.335 8.5	0.335 8.5	31.0 1686	231.3 31590	45.96 68.4	22.24 108.6	67.17 300	72.34 323	86.12 383	94.73 422	103.34 460	111.86 498			63.54
PZ 27	18.00 457	12.00 305	0.375 9.5	0.375 9.5	30.2 1634	184.20 26784	40.52 60.3	27.00 131.0	65.45 292	70.48 314	83.91 374	92.30 412	100.89 448	109.08 486			100.00
AZ 18	24.81 630	14.96 380	0.375 9.5	0.375 9.5	33.5 1800	250.4 34200	49.99 74.4	24.17 118.0	72.58 324	78.18 348	93.05 414	102.85 458	111.88 497	120.96 538			89.52
AZ 18 rd .02" (-0.5 mm)	24.81 630	14.94 379.5	0.354 9.0	0.354 9.0	32.5 1748	242.9 33170	48.25 71.8	23.36 114.0	70.48 315	75.90 338	90.88 402	99.39 443	108.43 483	117.47 522			86.48
AZ 18 rd .04" (-1.0 mm)	24.81 630	14.92 379	0.335 8.5	0.335 8.5	31 1686	231.3 31590	45.96 68.4	22.24 108.6	67.17 300	72.34 323	86.12 383	94.73 422	103.34 460	111.86 498			82.37
AZ 13 ru .04" (-1.0 mm)	25.38 670	11.87 304	0.413 10.5	0.413 10.5	28.1 1491	156.0 21800	52.82 78.3	29.94 118.3	56.49 258	60.83 271	72.42 328	79.86 355	86.91 387	94.15 419			88.67
AZ 13 ru .02" (-0.5 mm)	25.38 670	11.95 303.9	0.394 10.0	0.394 10.0	25.0 1343	149.2 20880	50.26 74.8	28.86 117.8	54.16 242	58.32 260	69.42 308	76.37 340	83.81 371	90.25 401			84.67
AZ 13	25.38 670	11.93 303	0.375 9.5	0.375 9.5	24.2 1300	144.3 19760	48.38 72.0	21.82 107.0	52.42 234	56.48 251	67.20 299	73.92 323	80.84 359	87.36 388			81.79

ARBED
GROUP



**CONESTOGA-ROVERS
& ASSOCIATES**

4141 Davis Creek Court
Kalamazoo, Michigan 49001-0838
Telephone: (269) 344-1230 Fax: (269) 344-8558
www.CRAworld.com

TRANSMITTAL

DATE: 10/13/04

REFERENCE NO.: 017303.10.20
Former Willow Run Assembly / CVO
PROJECT NAME: Facility

TO: Beth Landale
Conestoga-Rovers and Associates, Inc.
1880 Assumption Street
Windsor, Ontario N8Y1C4, Canada
Phone: (519)-966-9886 FAX: (519)-966-3894

Please find enclosed: ☐ Draft ☐ Final
☐ Originals ☒ Other Submittal 017303-003
☐ Prints

Sent via: ☐ Mail ☐ Same Day Courier
☐ Overnight Courier ☒ Other PDF

QUANTITY	DESCRIPTION
1	Clay backfill source memorandum
SUBMITTAL REVIEW	
This review is for the sole purpose of ascertaining conformance with the general design concept, and in no way constitutes approval of the detail design inherent in the shop drawings, responsibility for which remains with the contractor submitting same.	
SUBMISSION NO. <u>17303-003</u>	
PROJECT NO. <u>17303</u>	
BY <u>B. Landale</u>	
DATE <u>10/14/04</u>	

☐ As Requested
☐ For Your Use

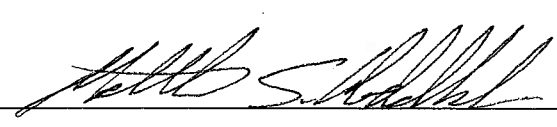
☒ For Review and Comment
☐ REVISE AS NOTED
☐ REVISE AND RESUBMIT

CONESTOGA - ROVERS & ASSOCIATES

COMMENTS:

Attached submittal for your review and approval

Copy to: Correspondence File
Completed by: Matthew S. Abdallah
[Please Print]

Signed: 

Filing: Correspondence File



**CONESTOGA-ROVERS
& ASSOCIATES**

4141 Davis Creek Court
Kalamazoo, Michigan 49001-0838
Telephone: (269) 344-1230 Fax: (269) 344-8558
www.CRAworld.com

MEMORANDUM

TO: Beth Landale

FROM: Matthew S. Abdallah *MSA*

C.C.: File

RE: Clay Backfill Source Summary

REF. NO.: 017303.10.20

DATE: 10/13/04

CRA Services the Construction Division of Conestoga-Rovers Inc. (CRA) is utilizing this memorandum to summarize the clay fill source for the AOC 18 DNAPL IRA – Sheet Pile Barrier Former Willow Run Assembly Plant/ CVO Facility (Site).

Edward C. Levy Aggregates Inc. did have a clay source available, however a sample of the source contained a large percentage of sand and gravel and is considered unusable for the project needs.

The following companies indicated they did not have a source of clay:

- B&V Construction Company;
- Waste Management Inc. of Michigan;
- London Aggregates Inc.;
- R&R Trucking Inc.;
- Farmer and Underwood Trucking Inc.; and,
- Hendrickson Trucking Inc.

Based on the above research in obtaining a source of clay for this project, CRA services contacted Wirt Stone Docks of Bay City, Michigan (Wirt).

Wirt does have a source of clay that has been used on a previous General Motors project; The source of clay has been analytically tested for the Middleground project; Approximately 420-tons will be required; and and the cost is approximately \$14.70/ ton.

Therefore it is CRA services opinion that the clay source that could be provided by Wirt should be used for this project.

This summary is being submitted to you as a submittal. Please let me know if CRA services can proceed with this idea and procure the clay from Wirt Stone Docks. If this is approved we will have to prepare a change order for the clay source and the equipment to backfill the clay. Please note that the cost of the clay and the equipment was not included in the proposal, due to a design change requiring additional clay as indicated in memorandum 057, dated September 28, 2004.



**CONESTOGA-ROVERS
& ASSOCIATES**

4141 Davis Creek Court
Kalamazoo, Michigan 49001-0838
Telephone: (269) 344-1230 Fax: (269) 344-8558
www.CRAworld.com

TRANSMITTAL

DATE:

11/12/04

REFERENCE NO.:

017303.10.80

PROJECT NAME:

Former Willow Run Assembly/ CVO
Facility

TO:

Beth Landale

Conestoga-Rovers and Associates, Inc.

1880 Assumption Street

Windsor, Ontario N8Y1C4, Canada

Phone: (519)-966-9886 FAX: (519)-966-3894

Please find enclosed:

☐

Draft

☐

Originals

☐

Prints

☐

Final

☒

Other

Revised Submittal 017303-004A

Sent via:

☐

Mail

☐

Overnight Courier

☐

Same Day Courier

☒

Other

PDF

QUANTITY	DESCRIPTION
1	Brighton Analytical Preliminary results
1	Memorandum email describing topsoil source

☐

As Requested

☐

For Your Use

☒

For Review and Comment

☐☐

COMMENTS:

This is a revised submittal based on the latest round of analytical results for the topsoil source.

Copy to:

Correspondence File

Completed by:

Matthew S. Abdallah

[Please Print]

Signed:

Matthew S. Abdallah

SUBMITTAL REVIEW

This review is for the sole purpose of ascertaining conformance with the general design concept, and in no way constitutes approval of the detail design inherent in the shop drawings, responsibility for which remains with the contractor submitting same.

☒ REVIEWED

☐ REVISE AS NOTED

☐ REVISE AND RESUBMIT

SUBMISSION NO. 17303-004A

PROJECT NO. 17303

BY B. Landale

DATE 11/12/04



Brighton Analytical, L.L.C.

2105 Pless Drive

Brighton, Michigan 48116

Phone: (810) 229-7575 FAX: (810) 229-8650

To: Conestoga Rovers and Associates

14496 Sheldon Road

Suite 200

Plymouth, MI 48170

Sample Date: 11/05/2004

Submit Date: 11/05/2004

Report Date: 11/11/2004

BA Report Number: 76147

Project Name: Willow Run CNO

BA Sample ID: BG07349

Project Number: 17303

Sample ID: S-17303-110504-BH-001

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Total Metal Analysis						
Total Arsenic	2.5	mg/Kg	0.10	SW846 6020	GW	11/08/2004
Total Barium	27	mg/Kg	1.0	SW846 6020	GW	11/08/2004
Total Cadmium	0.42	mg/Kg	0.05	SW846 6020	GW	11/08/2004
Total Chromium	6.1	mg/Kg	0.50	SW846 6020	GW	11/08/2004
Total Copper	9.4	mg/Kg	1.0	SW846 6020	GW	11/08/2004
Total Lead	7.4	mg/Kg	1.0	SW846 6020	GW	11/08/2004
Total Mercury	Not detected	mg/Kg	0.10	SW846 7471	KW	11/08/2004
Total Selenium	0.66	mg/Kg	0.20	SW846 6020	GW	11/08/2004
Total Silver	Not detected	mg/Kg	0.50	SW846 6020	GW	11/08/2004
Total Zinc	22	mg/Kg	1.0	SW846 6020	GW	11/08/2004
Metal Soil (digestion)	Digested			3050	PR	11/08/2004
Mercury (digestion)	Digested			7470/7471	KW	11/08/2004
SPLP Metal Analysis						
SPLP Selenium	Not detected	mg/L	0.005	SW846 6020	GW	11/11/2004
SPLP Metals (digestion)	Digested			3015	PR	11/11/2004
TPH Analysis						
Total Petroleum Hydrocarbons	110	mg/Kg	10	EPA 1664M	MB	11/08/2004
TPH 1664(extraction)	Extracted			1664	MB	11/08/2004
PCB Analysis						
ARO 1016	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004
ARO 1221	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004
ARO 1232	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004
ARO 1242	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004
ARO 1248	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004
ARO 1254	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004
ARO 1260	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004



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2105 Pless Drive
Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/05/2004
Submit Date: 11/05/2004
Report Date: 11/11/2004

To: Conestoga Rovers and Associates
14496 Sheldon Road
Suite 200
Plymouth, MI 48170

BA Report Number: 76147
BA Sample ID: BG07349

Project Name: Willow Run CNO
Project Number: 17303
Sample ID: S-17303-110504-BH-001

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
ARO 1262	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004
ARO 1268	Not detected	ug/Kg	330	SW846 8082	BY	11/08/2004
PCB (extraction)	Extracted			3510/3550	LS	11/08/2004

Volatile Analysis(Methanol Preserved)

Acetone	Not detected	ug/Kg	750	SW846 8260	CW	11/06/2004
Benzene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
Bromochloromethane	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
Bromodichloromethane	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
Bromoform	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
Bromomethane	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
2-Butanone (MEK)	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
Carbon disulfide	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
Carbon tetrachloride	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
Chlorobenzene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
Chloroethane	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
Chloroform	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
Chloromethane	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
cis-1,2-Dichloroethene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
cis-1,3-Dichloropropene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
Cyclohexane	Not detected	ug/Kg	2500	SW846 8260	CW	11/06/2004
1,2-Dibromo-3-Chloropropane	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
Dibromochloromethane	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
1,2-Dibromoethane	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
1,2-Dichlorobenzene	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
1,3-Dichlorobenzene	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
1,4-Dichlorobenzene	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
Dichlorodifluoromethane	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
1,1-Dichloroethane	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
1,2-Dichloroethane	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
1,1-Dichloroethene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
1,2-Dichloropropane	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004



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Brighton, Michigan 48116
Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/05/2004
Submit Date: 11/05/2004
Report Date: 11/11/2004

To: Conestoga Rovers and Associates
14496 Sheldon Road
Suite 200
Plymouth, MI 48170

BA Report Number: 76147
BA Sample ID: BG07349

Project Name: Willow Run CNO
Project Number: 17303
Sample ID: S-17303-110504-BH-001

Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
Ethyl benzene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
2-Hexanone	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
Isopropylbenzene	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
Methyl acetate	Not detected	ug/Kg	5000	SW846 8260	CW	11/06/2004
Methyl(tert)butyl ether(MTBE)	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
4-Methyl-2-pentanone(MIBK)	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
Methylcyclohexane	Not detected	ug/Kg	2500	SW846 8260	CW	11/06/2004
Methylene chloride	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
Styrene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
1,1,2,2-Tetrachloroethane	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
Tetrachloroethene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
Toluene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
trans-1,2-Dichloroethene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
trans-1,3-Dichloropropene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
1,1,2Trichloro1,2,2trifluoroethane	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
1,2,3-Trichlorobenzene	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
1,2,4-Trichlorobenzene	Not detected	ug/Kg	250	SW846 8260	CW	11/06/2004
1,1,1-Trichloroethane	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
1,1,2-Trichloroethane	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
Trichloroethene	Not detected	ug/Kg	50	SW846 8260	CW	11/06/2004
Trichlorofluoromethane	Not detected	ug/Kg	100	SW846 8260	CW	11/06/2004
Vinyl chloride	Not detected	ug/Kg	40	SW846 8260	CW	11/06/2004
Xylenes(total)	Not detected	ug/Kg	150	SW846 8260	CW	11/06/2004
EPA Method 5035 Methanol Preserv	Extracted			EPA 5035	WT	11/04/2004
%Solid	83.7	%		ASTM D-2216	GW	11/08/2004



Brighton Analytical, L.L.C.

2105 Pless Drive

Brighton, Michigan 48116

Phone: (810) 229-7575 FAX: (810) 229-8650

Sample Date: 11/05/2004

Submit Date: 11/05/2004

Report Date: 11/11/2004

To: Conestoga Rovers and Associates

14496 Sheldon Road

Suite 200

Plymouth, MI 48170

BA Report Number: 76147

BA Sample ID: BG07349

Project Name: Willow Run CNO

Project Number: 17303

Sample ID: S-17303-110504-BH-001

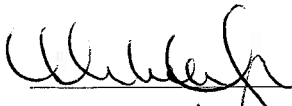
Parameters	Results	Units	DL	Method Reference	Analyst	Analysis Date
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All soil results based on dry weight.

DL=Detection Limit as recommended by MDEQ

Released by:

Date:


11-11-04