

Fraser Shipyards, Inc.

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***Partial Closure Documentation AOC #5 and  
Additional Investigation Report MW-5***

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Superior, Wisconsin

SEH No. FRASE9401.00

February 1999

SHORT ELLIOTT HENDRICKSON INC.



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Partial Closure Documentation AOC #5 and  
Additional Investigation Report MW-5

Fraser Shipyards, Inc.  
Superior, Wisconsin

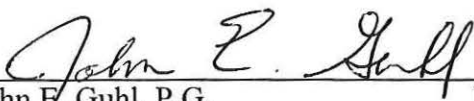
Prepared for:  
Fraser Shipyards, Inc.  
Superior, Wisconsin

Prepared by:  
Short Elliott Hendrickson Inc.  
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(715) 720-6200


I, Gloria Chojnacki, hereby certify that I am a scientist as that term is defined in s. NR 712.03(3), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

 2-25-99  
Gloria Chojnacki, CHMM Date  
Environmental Scientist

I, John E. Guhl, 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 document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

 #120 2/25/99  
John E. Guhl, P.G. P.G. Number Date  
Hydrogeologist

I, Cyrus W. Ingraham, 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 document 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 document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

 E-24690 2/25/99  
Cyrus W. Ingraham, P.E. P.E. Number Date  
Sr. Project Manager

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# Partial Closure Documentation AOC #5 and Additional Investigation Report MW-5

Fraser Shipyards, Inc.

Prepared for Fraser Shipyards, Inc.

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## 1.0 Introduction

On behalf of Fraser Shipyards Inc. (Fraser), Short Elliott Hendrickson, Inc. (SEH) has completed a site investigation to address polynuclear aromatic hydrocarbon (PAH) contamination identified in groundwater monitoring well MW-5. In addition, groundwater sampling was conducted at area of concern (AOC) #5 where past dissolved lead was identified in groundwater samples.

This report was developed to meet the requirements for site investigation reporting in general accordance with ch. NR 716 Wisconsin Administrative Code. The required site investigation activities for defining degree and extent of contamination in monitoring well MW-5 and to provide additional lead analytical data from AOC #5 have been performed in accordance with the Wisconsin Department of Natural Resource's (WDNRs) approved "Additional Investigation Work Plan - Monitoring Well MW-5 and AOC #5" (March 1998).

A Site Investigation Work Plan (November 1993) which contained general and specific site information regarding history, waste materials, handling procedures, SEH standard operating protocols (SOPs), and other pertinent project information was submitted by Fraser to the WDNR.

### 1.1 Scope of Work

SEH performed the following activities in order to assess groundwater contaminants identified at the Fraser facility:

- Groundwater sampling and analysis of monitoring well, MW-5, and three hydraulic probe borings placed in the immediate area surrounding MW-5.
- Laboratory analysis of groundwater collected from the monitoring well located at AOC #5.
- Report preparation.

## 1.2 Project Contacts

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Gloria Chojnacki, CHMM, Environmental Scientist  
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421 Frenette Drive  
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(715) 720-6231

## 2.0 Background Information

The Fraser facility is located at Third Street and Clough Avenue in Superior, Wisconsin as depicted on Figure 1, "Site Location." The site is located on Howard's Bay in Section 11, T49N, R14W, Douglas County, Wisconsin.

Monitoring well, MW-5, was installed at Fraser on August 16, 1996 to provide up gradient data for several AOCs at the facility. PAHs were identified in groundwater samples collected from monitoring well MW-5, including concentrations of benzo(a)pyrene and benzo(b)fluoranthene exceeding the ch. NR 140 groundwater quality Enforcement Standards (ES). Consequently, the WDNR required additional investigation of the area around MW-5 to define the degree and extent of PAH contamination. The location of monitoring well MW-5 is depicted on Figure 2, "Site Plan."



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AOC #5 is one of 14 AOCs identified at the Fraser facility by WDNR in 1993. The AOC #5 area was historically used to temporarily stage waste materials from Fraser's painting operations prior to disposal. The wastes were staged in two portable aboveground containers. The wastes included paint wastes potentially mixed with dirty solvents. The two storage containers have been cleaned, cut up, and recycled. Paint waste materials are no longer staged in AOC #5. The location of AOC #5 is depicted on Figure 2.

Six soil samples were collected from AOC #5 in January 1994 and were analyzed for volatile organic compounds (VOCs), and total lead, cadmium, chromium, and mercury. No VOCs were detected in the soil samples; however, elevated concentrations of total lead and total chromium were detected. Toxicity characteristic leaching procedure (TCLP) analysis of the most elevated concentration of total lead and total chromium yielded no detectable concentrations of these two parameters. This indicates the lead and chromium detected in the soil sample is not significantly leachable.

One groundwater monitoring well (MW-2) was installed on the down gradient side of AOC #5 on August 16, 1996. Two rounds of groundwater samples have been collected and analyzed for concentrations of total dissolved lead and total dissolved chromium. Initial groundwater analytical results indicated concentrations of dissolved lead which exceeded the ES for lead (15 µg/l). Dissolved lead concentrations of 48.8 µg/l to 34.2 µg/l were present in samples collected from well MW-2 in 1996. Chromium was not detected in the groundwater samples collected from well MW-2.

A total of six hydraulic probe borings were used to collect additional groundwater data in the vicinity of AOC #5 in September 1997. Groundwater samples collected from the six hydraulic probe borings as well as from existing monitoring well MW-2 were analyzed for concentrations of total dissolved lead. Lead was not detected in concentrations exceeding ch. NR 140, Preventative Action Limits during this round of sampling. Based on the review of the groundwater data for AOC #5, additional rounds of groundwater monitoring including both dissolved and total lead groundwater analysis at this location was required by WDNR.

### **3.0 Geology, Hydrogeology, and Topography**

#### **3.1 Geology**

Preliminary soil survey information was provided by the USDA Soil Conservation Survey located in Ashland, Wisconsin. Soils on the Fraser Shipyard property are classified as Udorthents which form 1 to 6 percent slopes. Udorthents occur in areas where the original soil

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profile has been altered by the addition or removal of more than about a foot of soil materials.

Soils adjacent to the south side of the property area classified within the Ontonagon-Rudyard complex. This soil type occurs as an intermix of moderately well drained Ontonagon soil and somewhat poorly drained Rudyard soil. Rudyard soils form in clayey lacustrine deposits.

Ontonagon silty clay loams occur adjacent to the southeast corner of the property. These are well drained, highly erodible soils which occur on 6 to 12 percent slopes and form in clayey lacustrine deposits.

Groundwater in the Ontonagon-Rudyard soil series is generally found at depths less than six feet from the surface and can be perched. Depth to groundwater in the Ontonagon silty clay loams is typically greater than six feet from surface.

Underlying the surface soils in the vicinity of the site are glacial till deposits belonging to the Douglas Creek Member of the Miller Creek Formation. The Douglas Creek till is comprised of fine textured glacial till averaging 10 percent sand, 26 percent silt and 64 percent clay in the less-than-2 mm fraction. It is typically reddish-brown in color and averages 54 percent illite in the less-than-2 mm fraction. The Douglas Member is generally the surface unit throughout most of the Lake Superior bluffs, but in a few places is overlain by fluvial or lacustrine sand and gravel deposits or offshore silt and clay deposits of the Miller Creek Formation or younger fluvial, lacustrine, and organic deposits. Most of the Douglas Member is till deposited by ice of the Superior Lobe.

The Miller Creek Formation soils are generally underlain by sand and gravel soils of the Copper Falls Formation in the vicinity of Superior. The Copper Falls Formation consists of glacial sand and gravel tills and fluvial deposits.

Subsurface investigation of MW-5 indicates the presence of approximately five feet of earthen fill materials underlain by a three foot thick layer of silty sand at MW-5. A black peat-like material was also observed in the three hydraulic probe boring locations performed around MW-5. Lean clay soils of the Miller Creek Formation are present beneath the silty sand layer and black peat-like material.

Subsurface investigation of AOC #5 indicated the presence of 8.5 feet of fill materials, consisting of layers of sand and clay. A thin layer of organic clay separates the fill materials from the underlying clay soils of the Miller Creek Formation. The underlying Copper Falls Formation, and subsequent bedrock units were not encountered during site investigation at MW-5 and AOC #5.



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### **3.2 Hydrogeology**

Two major aquifers are present in the vicinity of Superior; the sand and gravel aquifer and the sandstone aquifer. The sand and gravel aquifer either occurs in recent surficial deposits (e.g., sand deposits on Wisconsin Point), or in buried Pleistocene sand and gravel deposits (e.g., the Copper Falls Formation). The sandstone aquifer is comprised of the Cambrian to Precambrian sandstone and shale deposits of the Bayfield and Oronto groups. Regional direction of groundwater flow in the Superior area is generally to the north (toward Lake Superior).

The shallow groundwater surface occurs at approximately 3.5 feet to 4.5 feet below ground surface (bgs) in the vicinity of MW-5 and AOC #5. Direction of shallow groundwater flow is generally to the north, with a horizontal hydraulic gradient of approximately 0.006 ft/ft in these areas based on site monitoring well observations.

### **3.3 Topography**

The site vicinity lies in the Lake Superior lowland physiographic province, which consists of a glacial lake plain sloping gently to the north. Elevation of the property ranges from approximately 601 to 610 feet mean sea level (MSL). Surface water from the site drains overland to Lake Superior.

## **4.0 Additional Investigation**

Additional investigation was performed at the facility by SEH on August 25, 1998. Two additional rounds of groundwater were collected at quarterly intervals on October 2, 1998 and January 19, 1999. The investigation was performed in accordance with SEHs March 1998 Additional Investigation Workplan - Monitoring well MW-5 and AOC #5.

### **4.1 Groundwater Sampling**

Three hydraulic probe borings were performed on August 25, 1998 at the facility by Matrix Technologies Corp. (subcontractor to SEH) to define the degree and extent of groundwater contamination in the immediate vicinity of existing well, MW-5. A truck-mounted hydraulic probe sampler was mobilized to the site for the collection of groundwater samples to be used as a screening process for the identification of potential groundwater contamination. The hydraulic probes were placed around MW-5 in the locations depicted on Figure 2.

The probes were advanced to a depth of eight feet bgs where a screened section of the probe was then exposed from the four to eight foot depth interval within saturated fill soils. Soil boring logs were completed for each boring and are presented in Appendix A, "Soil Boring Documentation."



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Dedicated disposable polyethylene tubing was inserted into the screened interval of each boring and groundwater was brought to the surface using a peristaltic pump. Existing wells, MW-5 and MW-2 (located at AOC #5), were also sampled during each sampling event using disposable polyethylene tubing and a peristaltic pump after four times the volume of water standing in the well casings were removed.

Groundwater samples collected from the three hydraulic probe borings and MW-5 were placed in one liter amber bottles and analyzed for PAHs (EPA Method 8310). Filtered and an unfiltered groundwater samples were collected from MW-2 (AOC #5) for lead analyses (EPA Method 7421). Dissolved lead samples were filtered with 0.45 micron filters and unfiltered samples were analyzed for total lead. Samples collected for both lead analyses were placed in polyethylene bottles at the time of collection and preserved with nitric acid to a pH of less than 2.

All water samples were immediately placed on ice for shipment via overnight courier. Samples were delivered to U.S. Filter (formerly Enviroscan Corp.) of Rothschild, Wisconsin (Wisconsin Certification No. 737053130) utilizing standard chain of custody documentation.

Upon completion of sampling activities, the hydraulic probe boreholes were abandoned in accordance with ch. NR 141 Wisconsin Administrative Code guidelines. Borehole abandonment forms are presented in Appendix A.

## **4.2 Groundwater Analytical Results**

### **4.2.1 MW-5 and Hydraulic Probe Samples**

Groundwater samples collected from monitoring well, MW-5 and hydraulic probes, HP-1A, HP-2A, HP-3A were analyzed for PAHs. Groundwater collected from MW-5 appeared clear during each sampling event after well purging and indicated one minor detection of naphthalene (0.193 µg/l) during the first round of groundwater collection on August 25, 1998. The concentration of naphthalene is well below the ch. NR 140 Preventive Action Limit (PAL) for naphthalene of 8 g/l. Two subsequent rounds of groundwater sampling at MW-5 (October 20, 1998 and January 29, 1999) did not indicate the presence of any PAHs above the detection limit.

Groundwater collected from the three hydraulic probe borings (August 25, 1998) appeared turbid. Numerous detections of PAHs were indicated in all three water samples including exceedance of the ch. NR 140 ES for benzo(a)pyrene, benzo(b)fluoranthene, and chrysene. The Preventive Action Limit (PAL) was exceeded for fluoranthene and pyrene as well. Purging of the hydraulic probe borings was not possible and the groundwater samples contained a

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considerable amount of suspended organic solids. The PAHs detected are likely associated with suspended organic solids within the groundwater samples. Comparison of the hydraulic probe sample results to the ch. NR 140 standards is for screening purposes only since purging of the borings could not be performed.

Total PAH concentrations ranged from 30.8 µg/l at HP-1A to 538 µg/l at HP-3A. A summary of current and historical analytical results at MW-5 is found on Table 1, "Groundwater Analytical Results." A copy of the laboratory results is located in Appendix B, "Laboratory Results."

#### **4.2.2 MW-2 (AOC #5) Samples**

Groundwater samples collected from monitoring well, MW-2, were analyzed for both dissolved lead (filtered samples) and total lead (unfiltered samples). Groundwater samples collected from MW-2 appeared clear after well purging during each sampling event. Samples collected during the current additional investigation were analyzed using EPA Method 7421. Prior analyses of dissolved lead conducted at this AOC were analyzed using EPA Method 239.2. According to the laboratory performing the analysis, the two methods are nearly identical and therefore comparable.

Groundwater results from samples collected during the August 1998 and January 1999 sampling events indicated no detections of dissolved lead. The October 1998 sampling event indicated a total dissolved lead concentration of 3.08 µg/l, which exceeds the PAL for lead (1.5 µg/l). No ES exceedances for dissolved lead were identified in MW-2 during the August 1998, October 1998, and January 1999 sampling rounds.

Total lead concentrations were not detected in groundwater samples collected during the August 1998 sampling event. Subsequent quarterly sampling (October 1998 and January 1999) indicated a total lead concentration of 8.38 µg/l and 1.49 µg/l, respectively. A summary of current and historical analytical results at MW-2 is found on Table 1. A copy of the laboratory results is located in Appendix B.

## **5.0 Conclusions and Recommendations**

### **5.1 MW-5 and Hydraulic Probe Samples**

Soil analytical results from the 2.5 foot to 4.5 foot depth interval at MW-5 collected on August 16, 1996 indicate the presence of diesel range organic (DRO) compounds and two volatile organic compounds (VOCs). Soil DRO concentration is 75.4 mg/kg, total xylene concentration is 0.041 mg/kg and the toluene concentration is 0.037 mg/kg indicating compliance with ch. NR 720 generic residual contaminant levels (RCLs) based on protection of groundwater (DRO = 100 mg/kg; total xylenes = 4.1 mg/kg; toluene = 1.5 mg/kg).



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Groundwater monitoring events at MW-5 prior to the current additional investigation indicated benzo(a)pyrene and benzo(b)fluoranthene concentrations which appear to be in excess of the ch. NR 140 ES. Current investigation of the area surrounding MW-5 to define the degree and extent of PAH contamination indicates no detection of PAHs in MW-5 after purging with a low flow peristaltic pump for the purpose of producing a sediment-free sample. Therefore, the previous PAH concentrations appear to be associated with sampling technique and particulate turbidity. The PAHs are likely bound to the soil particulates and are not impacting the groundwater as demonstrated by this investigation. Three successive quarterly rounds of groundwater have been collected at MW-5 which have demonstrated compliance with the requirements of ch. NR 140.

Groundwater collected from hydraulic probe samples surrounding MW-5 indicates detections of PAH compounds. Total PAH concentrations ranged from 30.8 µg/l at HP-1A to 538 µg/l at HP-3A. Collection of a sediment-free hydraulic probe groundwater sample was not possible at this site. Therefore, based on the absence of PAH detections with reduction of turbidity in samples as seen at MW-5 above, it is likely that PAH concentrations in the surrounding hydraulic probe samples are also associated with soil particulates and are not impacting the groundwater. No further investigation appears warranted in the vicinity of MW-5 at this time.

## **5.2 MW-2 (AOC #5) Samples**

Groundwater samples collected from MW-2 (AOC #5 - former Paint Waste Staging Area) indicate no detections above the ch. NR 140 ES for dissolved lead. Four successive quarterly rounds of groundwater have been collected which have demonstrated compliance with the requirements of ch. NR 140 (lead concentrations less than ES of 15 µg/l) and ch. NR 726.05(3). Accordingly, Fraser requests formal closure of AOC #5 with a Deed Restriction to allow soils exceeding the residential RCL for lead based on human health risk from direct contact related to land use to remain in place. WDNR Case Summary, Closeout Forms, and supporting documentation have been prepared and submitted along with this report.

## **6.0 Standard of Care**

The conclusions and recommendations contained in this report were arrived at in accordance with generally accepted professional engineering practice at this time and location. Other than this, no warranty is implied or intended.

GGC/ls/CWI/JEG

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## Tables

### Table 1 – Groundwater Analytical Results

**Table 1  
Groundwater Analytical Results**

Analytical Parameters	NR 140 Standards		Well No./Sampling Date																				
	ES	PAL	MW-2						HP-1	HP-2	HP-3	HP-4	HP-5	HP-6	MW-5					HP-1A	HP-2A	HP-3A	
			8/29/96	11/21/96	10/1/97	8/25/98	10/20/98	1/19/99	10/1/97	10/1/97	10/1/97	10/1/97	10/1/97	10/1/97	8/29/96	11/21/96	8/25/98	10/20/98	1/19/99	8/25/98	8/25/98	8/25/98	
<b>Total Dissolved Metals (µg/l)</b>																							
Chromium	100	10	BDL	BDL	--	--	--	--	--	--	--	--	--	--	BDL	BDL	--	--	--	--	--	--	
Cadmium	5	0.5	--	--	--	--	--	--	--	--	--	--	--	--	2.84	BDL	--	--	--	--	--	--	
Lead	15.0	1.5	48.8	34.2	BDL	BDL	3.08	BDL	BDL	1.06	BDL	BDL	BDL	BDL	BDL	BDL	--	--	--	--	--	--	
<b>Total Metals (µg/l)</b>																							
Lead	NSE	NSE	--	--	--	BDL	8.38	1.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
<b>PAHs<sup>1</sup> (µg/l)</b>																							
Acenaphthene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	BDL	BDL	BDL	BDL	BDL	BDL	BDL	9.04	
Anthracene	3,000	600	--	--	--	--	--	--	--	--	--	--	--	--	BDL	BDL	BDL	BDL	BDL	BDL	0.699	2.77	20.1
Benzo(a)Anthracene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	0.97	0.718	BDL	BDL	BDL	BDL	2.23	8.06	35.4
Benzo(a)Pyrene	0.2	0.02	--	--	--	--	--	--	--	--	--	--	--	--	1.42	0.785	BDL	BDL	BDL	BDL	3.27	12.4	27.2
Benzo(b)Fluoranthene	0.2	0.02	--	--	--	--	--	--	--	--	--	--	--	--	0.835	0.684	BDL	BDL	BDL	BDL	2.52	8.04	29
Benzo(k)Fluoranthene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	0.509	0.39	BDL	BDL	BDL	BDL	0.972	3.03	11.2
Benzo(ghi)Perylene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	0.541	0.415	BDL	BDL	BDL	BDL	1.78	6.64	14.1
Chrysene	0.2	0.02	--	--	--	--	--	--	--	--	--	--	--	--	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	45.5
Dibenzo(a,h)Anthracene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	BDL	BDL	BDL	BDL	BDL	BDL	0.325	1.33	3.26
Fluoranthene	400	80	--	--	--	--	--	--	--	--	--	--	--	--	2.97	BDL	BDL	BDL	BDL	BDL	7.69	26.3	142
Fluorene	400	80	--	--	--	--	--	--	--	--	--	--	--	--	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	4.21
Indeno(1,2,3-cd)Pyrene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	0.84	0.565	BDL	BDL	BDL	BDL	1.78	6.49	16.2
1-Methyl Naphthalene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	1.01	BDL	BDL	BDL	BDL	BDL	0.548	0.226	3.09
2-Methyl Naphthalene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	BDL	BDL	BDL	BDL	BDL	BDL	0.67	0.716	9.06
Naphthalene	40	8.0	--	--	--	--	--	--	--	--	--	--	--	--	0.338	BDL	0.193	BDL	BDL	BDL	0.593	BDL	BDL
Phenanthrene	NSE	NSE	--	--	--	--	--	--	--	--	--	--	--	--	1.48	1.03	BDL	BDL	BDL	BDL	2.02	7.63	80.8
Pyrene	250	50	--	--	--	--	--	--	--	--	--	--	--	--	4.25	BDL	BDL	BDL	BDL	BDL	5.71	21	88.1

NSE = No standard established  
 BDL = Below laboratory detection limits  
 -- = Not analyzed for  
 48.8 = Exceeds ch. NR 140 Enforcement Standard (ES)  
 2.84 = Exceeds ch. NR 140 Preventive Action Limit (PAL)  
<sup>1</sup> = PAH list is not complete; PAHs not listed are BDL  
 Compiled by: GGC Checked by: JEG

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## **Figures**

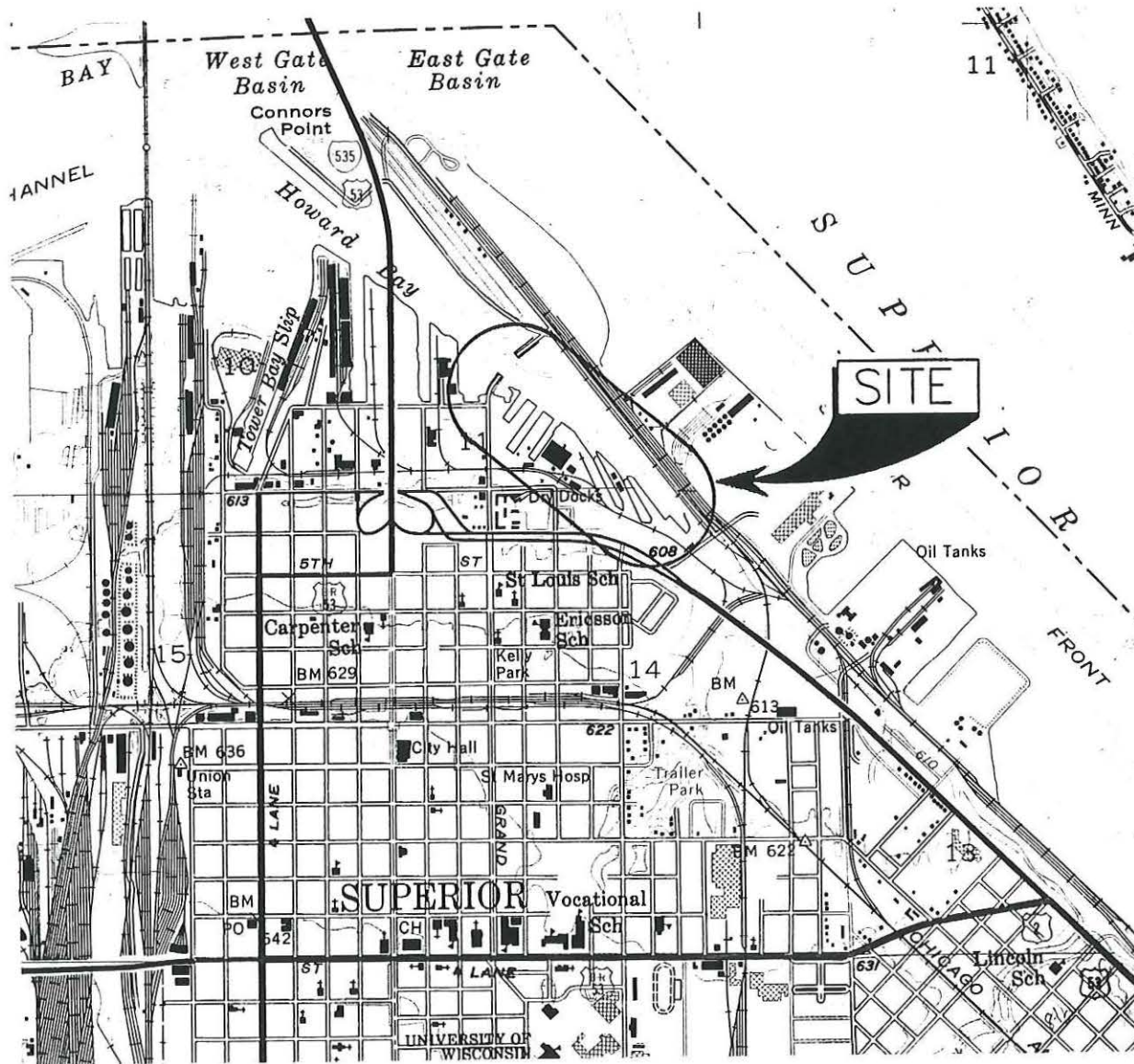
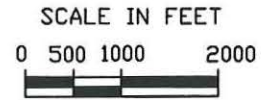
Figure 1 – Site Location

Figure 2 – Site Plan

Figure 3 – Groundwater Contours



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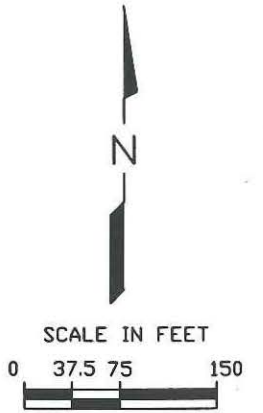
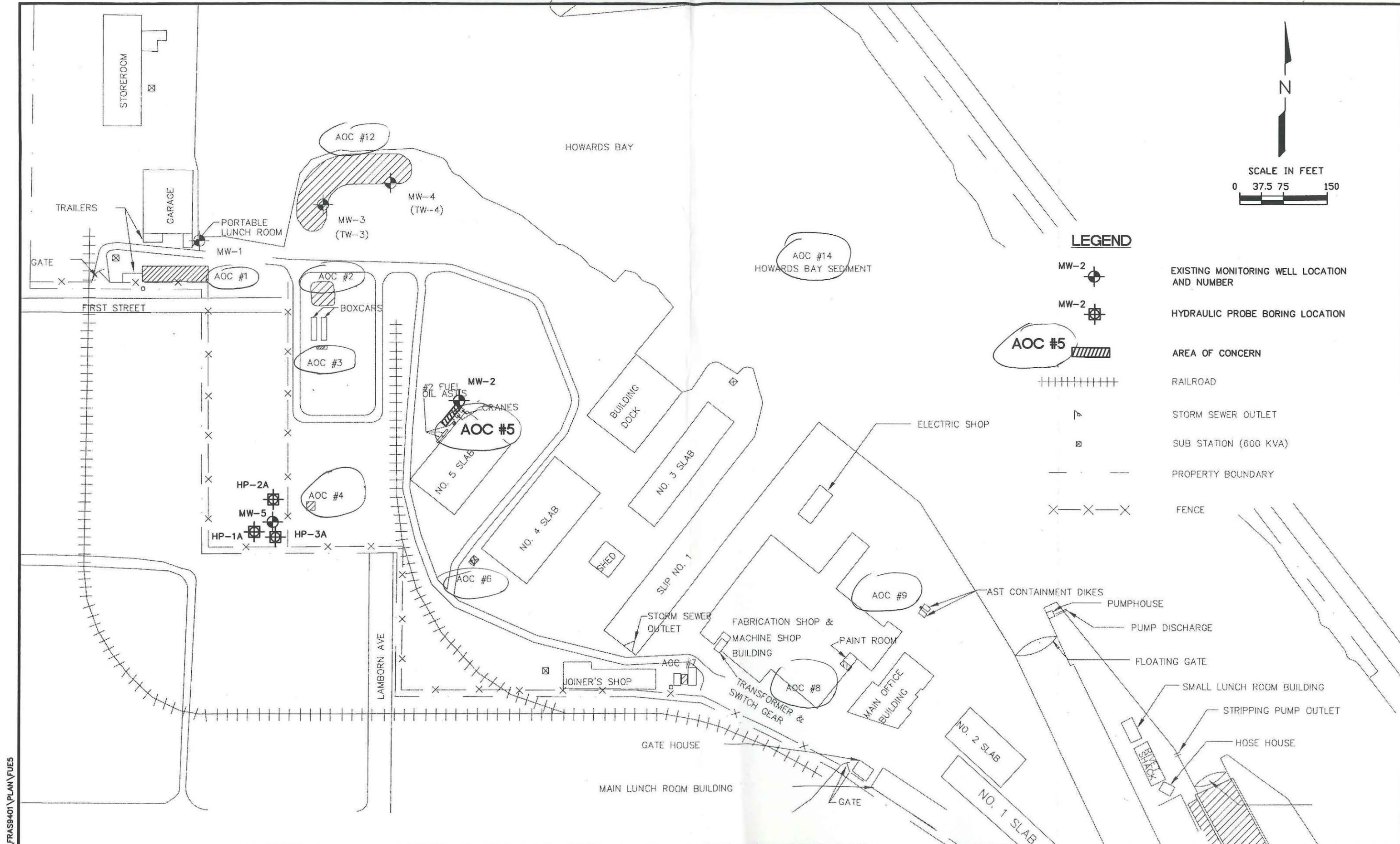
**FRASER SHIPYARDS, INC.**  
 PARTIAL CLOSURE DOCUMENTATION  
 AOC #5 AND ADDITIONAL  
 INVESTIGATION REPORT MW-5

**FIGURE 1**  
**SITE LOCATION**

PROJ. NO.  
 FRAS9401  
 DATE  
 02/22/99

**1**  
**3**





**LEGEND**

- EXISTING MONITORING WELL LOCATION AND NUMBER
- HYDRAULIC PROBE BORING LOCATION
- AREA OF CONCERN
- RAILROAD
- STORM SEWER OUTLET
- SUB STATION (600 KVA)
- PROPERTY BOUNDARY
- FENCE

F:\WASTE\FRAS9401\PLAN\FUES

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NO.	DATE	ISSUE/REVISIONS	DRAWN BY	DESIGN	FIELD REVIEW	QC CHECK			

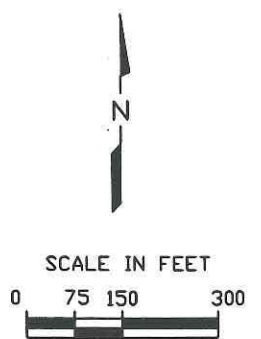
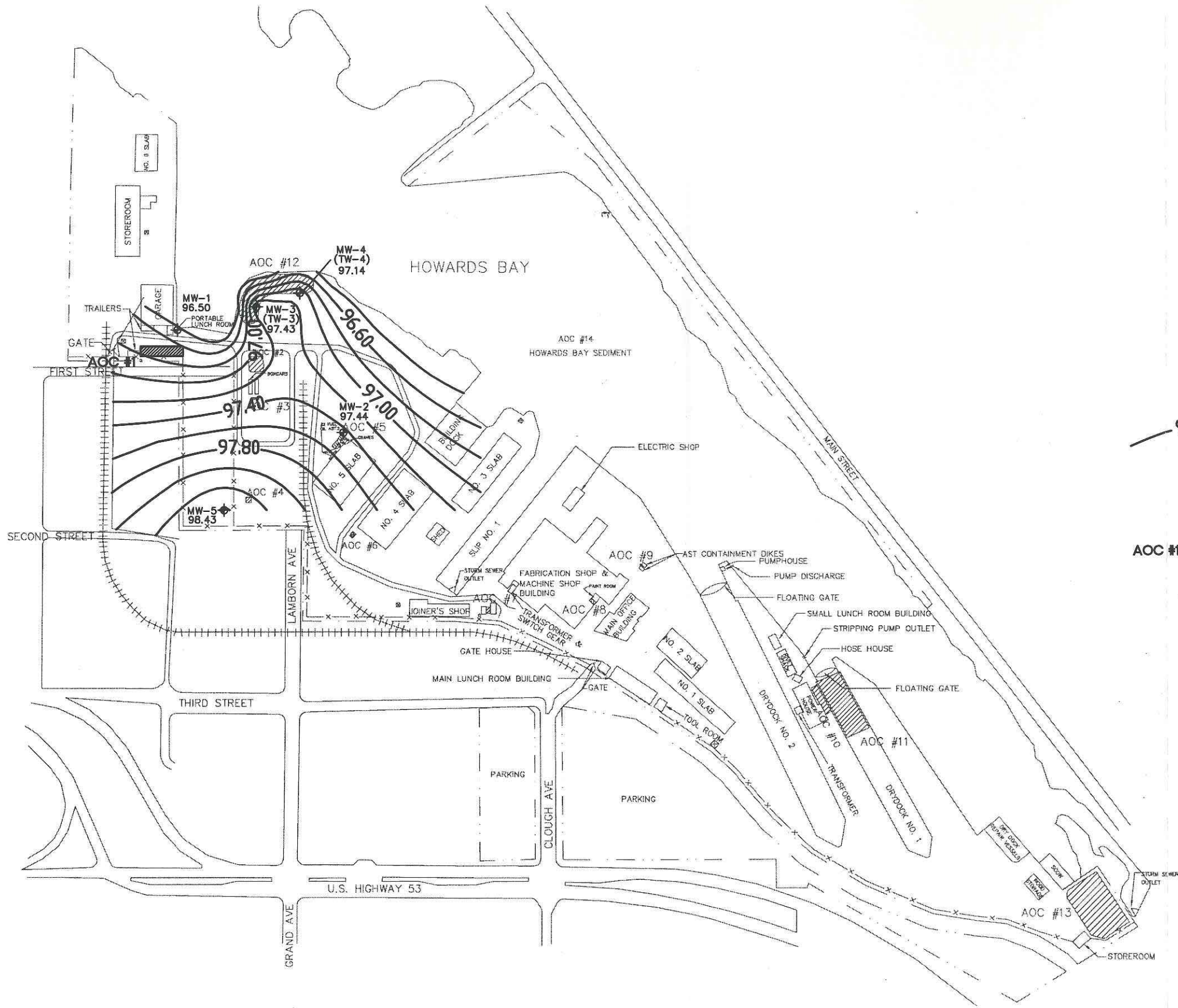


**FRASER SHIPYARDS, INC.**  
**PARTIAL CLOSURE DOCUMENTATION**  
**AOC #5 AND ADDITIONAL**  
**INVESTIGATION REPORT MW-5**

**FIGURE 2**  
**SITE PLAN**

PROJ. NO. FRAS9401	<b>2</b> <b>3</b>
DATE 02/22/99	





**LEGEND**

- 97.80 ———— STATIC GROUNDWATER ELEVATION CONTOURS  
CONTOUR INTERVAL=0.20 FT
- MW-1 96.50 ———— EXISTING GROUNDWATER MONITORING WELL LOCATION AND NUMBER WITH STATIC WATER ELEVATION AS OF 08/29/96.
- AOC #1 ———— AREAS OF CONCERN
- ++++++ RAILROAD
- STORM SEWER OUTLET
- SUB STATION (600 KVA)
- - - - - PROPERTY BOUNDARY
- x-x-x-x-x FENCE

**NOTES:**

1. GROUNDWATER ELEVATIONS MEASURED BY SEH ON AUGUST 29, 1996.
2. LAKE SURFACE ELEVATION MEASURED BY SEH ON NOVEMBER 21, 1996.
3. ELEVATIONS (IN FEET) REFERENCED TO ARBITRARY SITE DATUM.
4. GROUNDWATER ELEVATION CONTOURS GENERATED USING SURFER® (KRIGING METHOD)

F:\WASTE\DWG2\WASTE\FRAS9401\PLAN\FUW2

1	02/22/99	-----	JLE	02/99	JEG	02/99		SEG	2/99
NO.	DATE	ISSUE/REVISIONS	DRAWN BY	DESIGN	FIELD REVIEW	QC CHECK			



**FRASER SHIPYARDS, INC.**  
**PARTIAL CLOSURE DOCUMENTATION**  
**AOC #5 AND ADDITIONAL**  
**INVESTIGATION REPORT MW-5**

**FIGURE 3**  
**GROUNDWATER CONTOURS**

PROJ. NO.	FRAS9401	<b>3</b>
DATE	02/22/99	<b>3</b>

---

## **Appendix A**

### Soil Boring Documentation

Facility/Project Name <b>FRASER SHIPYARD</b>			License/Permit/Monitoring Number		Boring Number <b>HP-1A</b>	
Boring Drilled By (Firm name and name of crew chief) <b>Matrix Technologies / Guy Paquette</b>			Date Drilling Started <b>8/25/98</b>		Date Drilling Completed <b>8/25/98</b>	
DNR Facility Well No.			WI Unique Well No.		Common Well Name	
Final Static Water Level Feet MSL			Surface Elevation Feet MSL		Borehole Diameter <b>1.0</b> Inches	
Boring Location State Plane 1/4 of      1/4 of Section			N, E T      N,R		Local Grid Location (If applicable) Lat      0' " Long      0' " Feet <input type="checkbox"/> N <input type="checkbox"/> E Feet <input type="checkbox"/> S <input type="checkbox"/> W	
County <b>DOUGLAS</b>			DNR County Code		Civil Town/City/ or Village <b>SUPERIOR</b>	

Sample Number	Length (in) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
			1 2 3 4 5 6 7 8	Blind drilled to 8.0 ft.        Screened interval from 4 to 8 ft.        Black peatlike residual on bottom of screen End of Hydraulic Probe Boring @ 8.0 ft.										

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

Signature <i>John E. Gullf</i>	Firm <b>ESEH</b> SEH 421 Frenette Drive Chippewa Falls, WI. 54729 Tel: 715-720-6200, Fax: 715-720-6300
-----------------------------------	---



This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.



Facility/Project Name <b>FRASER SHIPYARD</b>			License/Permit/Monitoring Number		Boring Number <b>HP-2A</b>	
Boring Drilled By (Firm name and name of crew chief) <b>Matrix Technologies / Guy Paquette</b>			Date Drilling Started <b>8/25/98</b>		Date Drilling Completed <b>8/25/98</b>	
DNR Facility Well No.			WI Unique Well No.		Common Well Name	
Final Static Water Level Feet MSL			Surface Elevation Feet MSL		Borehole Diameter <b>1.0 Inches</b>	
Boring Location State Plane 1/4 of      1/4 of Section			N, E T      N,R		Local Grid Location (If applicable) Lat      0' " <input type="checkbox"/> N <input type="checkbox"/> E Long      0' "      Feet <input type="checkbox"/> S      Feet <input type="checkbox"/> W	
County <b>DOUGLAS</b>			DNR County Code		Civil Town/City/ or Village <b>SUPERIOR</b>	

Sample Number	Length (in) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
			1 2 3 4 5 6 7 8	Blind drilled to 8.0 ft.        Screened interval from 4 to 8 ft.        Black peatlike residual on bottom of screen End of Hydraulic Probe Boring @ 8.0 ft.										

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

Signature 	Firm  SEH 421 Frenette Drive Chippewa Falls, WI. 54729 Tel: 715-720-6200, Fax: 715-720-6300
--	--

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Facility/Project Name <b>FRASER SHIPYARD</b>			License/Permit/Monitoring Number		Boring Number <b>HP-3A</b>	
Boring Drilled By (Firm name and name of crew chief) <b>Matrix Technologies / Guy Paquette</b>			Date Drilling Started <b>8/25/98</b>		Date Drilling Completed <b>8/25/98</b>	
DNR Facility Well No.		WI Unique Well No.	Common Well Name		Final Static Water Level Feet MSL	Surface Elevation Feet MSL
						Borehole Diameter <b>1.0</b> Inches
Boring Location State Plane 1/4 of      1/4 of Section			N, E T      N,R		Local Grid Location (If applicable) Lat      0' " Long      0' " <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
County <b>DOUGLAS</b>			DNR County Code		Civil Town/City/ or Village <b>SUPERIOR</b>	

Sample Number	Length (in) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	
			1	Blind drilled to 8.0 ft.        Screened interval from 4 to 8 ft.        Black peatlike residual on bottom of screen End of Hydraulic Probe Boring @ 8.0 ft.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											

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

Signature

*John E. Gulef*

Firm



SEH 421 Frenette Drive  
Chippewa Falls, WI. 54729  
Tel: 715-720-6200, Fax: 715-720-6300

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.



All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME FRASER SHIPYARD</b>	
Well/Drillhole/Borehole Location	County <b>DOUGLAS</b>	Original Well Owner (If Known) <b>Fraser Shipyards</b>	
_____ 1/4 of _____ 1/4 of Sec. _____ ; T. _____ N; R. _____ <span style="float:right"><input type="checkbox"/> E <input type="checkbox"/> W</span>		Present Well Owner <b>Fraser Shipyards</b>	
(If Applicable) _____ Gov't Lot _____ Grid Number		Street or Route <b>Third St and Clough Ave</b>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <b>Superior, Wi 54880</b>	
Civil Town Name		Facility Well No. and/or Name (If Applicable)	WI Unique Well No.
Street Address of Well		<b>HP-1A</b>	
City, Village <b>SUPERIOR</b>		Reason For Abandonment <b>Hydraulic Probe Completed</b>	
		Date of Abandonment <b>8/25/98</b>	

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

<p><b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) _____</p> <p> <input type="checkbox"/> Monitoring Well  <input type="checkbox"/> Water Well  <input type="checkbox"/> Drillhole  <input checked="" type="checkbox"/> Borehole                 </p> <p>Construction Report Available?  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                 </p> <p>Construction Type:  <input type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug  <input checked="" type="checkbox"/> Other (Specify) <b>Hydraulic Probe</b> </p> <p>Formation Type:  <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock                 </p> <p>Total Well Depth (ft) _____ Casing Diameter (ins.) _____ (From ground surface)</p> <p>Casing Depth (Ft.) <u>N/A</u></p> <p>Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? <u>N/A</u> Feet</p>	<p><b>(4) Depth to Water (Feet)</b> <u>5 ft.</u></p> <p>                 Pump &amp; Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable                  Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable                  Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable                  Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                  If No, Explain <u>No Casing Used</u> </p> <p>                 Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                  Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                  Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                  If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No                 </p> <p><b>(5) Required Method of Placing Sealing Material</b>  <input checked="" type="checkbox"/> Conductor Pipe - Gravity <input type="checkbox"/> Conductor Pipe - Pumped  <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain)                 </p> <p><b>(6) Sealing Materials</b> For monitoring wells and monitoring well boreholes only</p> <p> <input type="checkbox"/> Neat Cement Grout  <input type="checkbox"/> Sand-Cement (Concrete) Grout  <input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite Pellets  <input type="checkbox"/> Clay-Sand Slurry <input checked="" type="checkbox"/> Granular Bentonite  <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Bentonite-Cement Grout  <input type="checkbox"/> Chipped Bentonite                 </p>
---	---

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Hydrated Bentonite	Surface	8.0	5 lbs.	

**(8) Comments** \_\_\_\_\_

**(9) Name of Person or Firm Doing Sealing Work**  
**SEH Short Elliott Hendrickson Inc.**

Signature of Person Doing Work <i>John E. Huff</i>	Date Signed <b>8-26-98</b>
Street or Route <b>421 Frenette Dr.</b>	Telephone Number <b>(715) 720-6200</b>
City, State, Zip Code <b>Chippewa Falls, WI 54729</b>	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	



All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b> FRASER SHIPYARD	
Well/Drillhole/Borehole Location	County <b>DOUGLAS</b>	Original Well Owner (If Known) <b>Fraser Shipyards</b>	
_____ 1/4 of _____ 1/4 of Sec. _____ ; T. _____ N; R. _____ <span style="float:right"><input type="checkbox"/> E <input type="checkbox"/> W</span>		Present Well Owner <b>Fraser Shipyards</b>	
(If Applicable) _____ Gov't Lot _____ Grid Number		Street or Route <b>Third St and Clough Ave</b>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <b>Superior, WI 54880</b>	
Civil Town Name		Facility Well No. and/or Name (If Applicable)	WI Unique Well No.
Street Address of Well		<b>HP-2A</b>	
City, Village <b>SUPERIOR</b>		Reason For Abandonment <b>Hydraulic Probe Completed</b>	
		Date of Abandonment <b>8/25/98</b>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>			
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) _____  <input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole <input checked="" type="checkbox"/> Borehole  Construction Report Available? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No  Construction Type: <input type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input checked="" type="checkbox"/> Other (Specify) <u>Hydraulic Probe</u>  Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock  Total Well Depth (ft) _____ Casing Diameter (ins.) _____ (From ground surface)  Casing Depth (Ft.) <u>N/A</u>  Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? <u>N/A</u> Feet	<b>(4) Depth to Water (Feet)</b> <u>5 ft.</u> Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If No, Explain - <u>No Casing Used</u>  Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>(5) Required Method of Placing Sealing Material</b> <input checked="" type="checkbox"/> Conductor Pipe - Gravity <input type="checkbox"/> Conductor Pipe - Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain)	<b>(6) Sealing Materials</b> For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Chipped Bentonite <input type="checkbox"/> Bentonite Pellets <input checked="" type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite-Cement Grout

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Hydrated Bentonite	Surface	8.0	5 lbs.	

(8) Comments \_\_\_\_\_

(9) Name of Person or Firm Doing Sealing Work  
**SEH Short Elliott Hendrickson Inc.**

Signature of Person Doing Work <i>John E. Gull</i>	Date Signed <b>8-26-98</b>
Street or Route <b>421 Frenette Dr.</b>	Telephone Number <b>(715) 720-6200</b>
City, State, Zip Code <b>Chippewa Falls, WI 54729</b>	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	



All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b> FRASER SHIPYARD	
Well/Drillhole/Borehole Location	County <b>DOUGLAS</b>	Original Well Owner (If Known) <b>Fraser Shipyards</b>	
_____ 1/4 of _____ 1/4 of Sec. _____ ; T. _____ N; R. _____ <input type="checkbox"/> E <input type="checkbox"/> W (If Applicable)		Present Well Owner <b>Fraser Shipyards</b>	
_____ Gov't Lot _____ Grid Number		Street or Route <b>Third St and Clough Ave</b>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <b>Superior, Wi 54880</b>	
Civil Town Name		Facility Well No. and/or Name (If Applicable)	WI Unique Well No.
Street Address of Well		<b>HP-3A</b>	
City, Village <b>SUPERIOR</b>		Reason For Abandonment <b>Hydraulic Probe Completed</b>	
		Date of Abandonment <b>8/25/98</b>	

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

**(3) Original Well/Drillhole/Borehole Construction Completed On** \_\_\_\_\_ (Date)

Monitoring Well  
 Water Well  
 Drillhole  
 Borehole

Construction Report Available?  
 Yes  No

Construction Type:  
 Drilled  Driven (Sandpoint)  Dug  
 Other (Specify) **Hydraulic Probe**

Formation Type:  
 Unconsolidated Formation  Bedrock

Total Well Depth (ft) \_\_\_\_\_ Casing Diameter (ins.) \_\_\_\_\_  
 (From ground surface)

Casing Depth (Ft.) N/A

Was Well Annular Space Grouted?  Yes  No  Unknown  
 If Yes, To What Depth? N/A Feet

**(4) Depth to Water (Feet)** 5 ft.

Pump & Piping Removed?  Yes  No  Not Applicable  
 Liner(s) Removed?  Yes  No  Not Applicable  
 Screen Removed?  Yes  No  Not Applicable  
 Casing Left in Place?  Yes  No  
 If No, Explain No Casing Used

Was Casing Cut Off Below Surface?  Yes  No  
 Did Sealing Material Rise to Surface?  Yes  No  
 Did Material Settle After 24 Hours?  Yes  No  
 If Yes, Was Hole Retopped?  Yes  No

**(5) Required Method of Placing Sealing Material**

Conductor Pipe - Gravity  Conductor Pipe - Pumped  
 Dump Bailer  Other (Explain)

**(6) Sealing Materials**

Neat Cement Grout  
 Sand-Cement (Concrete) Grout  
 Concrete  
 Clay-Sand Slurry  
 Bentonite-Sand Slurry  
 Chipped Bentonite

For monitoring wells and monitoring well boreholes only

Bentonite Pellets  
 Granular Bentonite  
 Bentonite-Cement Grout

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
Hydrated Bentonite	Surface	8.0	5 lbs.	

**(8) Comments** \_\_\_\_\_

**(9) Name of Person or Firm Doing Sealing Work**  
**SEH Short Elliott Hendrickson Inc.**

Signature of Person Doing Work: *John E. Hoff* Date Signed: **8-26-98**

Street or Route: **421 Frenette Dr.** Telephone Number: **(715) 720-6200**

City, State, Zip Code: **Chippewa Falls, WI 54729**

**(10) FOR DNR OR COUNTY USE ONLY**

Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

---

**Appendix B**  
Laboratory Results

# U.S. FILTER

**U.S. FILTER/ENVIROSCAN**  
301 WEST MILITARY ROAD  
ROTHSCHILD, WI 54474

TELEPHONE 715-359-7226  
FACSIMILE 715-355-3221

September 4, 1998

Short Elliott Henderickson  
421 Frenette Drive  
Chippewa Falls , WI 54729

SEP 8 1998

Attn: John Guhl

Please find enclosed the analytical results for the samples received August 27, 1998.

The chain of custody document is enclosed.

If you have any questions about the results, please call. Thank you for using US Filter/Enviroscan for your analytical needs.


Sincerely,

US Filter/Enviroscan



Cindy K. Varga  
Senior Analytical Chemist

Short Elliott Henderickson  
421 Frenette Drive  
Chippewa Falls , WI 54729

CUST NUMBER:  
SAMPLED BY: Client  
DATE REC'D: 08/27/98  
REPORT DATE: 09/04/98  
PREPARED BY: CKV  
REVIEWED BY: 

Attn: John Guhl


	Units	Reporting Limit	MW-5 08/25/98	Qualifiers	Date Analyzed	By
<b>EPA 8310</b>						
Acenaphthene	µg/l	0.11	X		09/02/98	GLS
Acenaphthylene	µg/l	0.08	X		09/02/98	GLS
Anthracene	µg/l	0.03	X		09/02/98	GLS
Benzo (a) Anthracene	µg/l	0.06	X		09/02/98	GLS
Benzo (a) Pyrene	µg/l	0.06	X		09/02/98	GLS
Benzo (b) Fluoranthene	µg/l	0.03	X		09/02/98	GLS
Benzo (k) Fluoranthene	µg/l	0.03	X		09/02/98	GLS
Benzo (ghi) Perylene	µg/l	0.05	X		09/02/98	GLS
Chrysene	µg/l	0.04	X		09/02/98	GLS
Dibenzo (a, h) Anthracene	µg/l	0.06	X		09/02/98	GLS
Fluoranthene	µg/l	0.04	X		09/02/98	GLS
Fluorene	µg/l	0.04	X		09/02/98	GLS
Indeno (1, 2, 3-cd) Pyrene	µg/l	0.04	X		09/02/98	GLS
1-Methyl Naphthalene	µg/l	0.06	X		09/02/98	GLS
2-Methyl Naphthalene	µg/l	0.07	X		09/02/98	GLS
Naphthalene	µg/l	0.05	0.193		09/02/98	GLS
Phenanthrene	µg/l	0.08	X		09/02/98	GLS
Pyrene	µg/l	0.17	X		09/02/98	GLS
Liquid Organic Extraction		-	COMP		08/28/98	CKV

Analytical No.: 47569

X = Analyzed but not detected.



Short Elliott Henderickson  
 421 Frenette Drive  
 Chippewa Falls, WI 54729

CUST NUMBER:  
 SAMPLED BY: Client  
 DATE REC'D: 08/27/98  
 REPORT DATE: 09/04/98  
 PREPARED BY: CKV  
 REVIEWED BY: 


Attn: John Guhl

	Units	Reporting Limit	HP-1A 08/25/98	Qualifiers	Date Analyzed	By
<u>EPA 8310</u>						
Acenaphthene	µg/l	0.11	X		09/02/98	GLS
Acenaphthylene	µg/l	0.08	X		09/02/98	GLS
Anthracene	µg/l	0.03	0.699		09/02/98	GLS
Benzo (a) Anthracene	µg/l	0.06	2.23		09/02/98	GLS
Benzo (a) Pyrene	µg/l	0.06	3.27		09/02/98	GLS
Benzo (b) Fluoranthene	µg/l	0.03	2.52		09/02/98	GLS
Benzo (k) Fluoranthene	µg/l	0.03	0.972		09/02/98	GLS
Benzo (ghi) Perylene	µg/l	0.05	1.78		09/02/98	GLS
Chrysene	µg/l	0.04	X		09/02/98	GLS
Dibenzo (a, h) Anthracene	µg/l	0.06	0.325		09/02/98	GLS
Fluoranthene	µg/l	0.04	7.69		09/02/98	GLS
Fluorene	µg/l	0.04	X		09/02/98	GLS
Indeno (1, 2, 3-cd) Pyrene	µg/l	0.04	1.78		09/02/98	GLS
1-Methyl Naphthalene	µg/l	0.06	0.548		09/02/98	GLS
2-Methyl Naphthalene	µg/l	0.07	0.670		09/02/98	GLS
Naphthalene	µg/l	0.05	0.593		09/02/98	GLS
Phenanthrene	µg/l	0.08	2.02		09/02/98	GLS
Pyrene	µg/l	0.17	5.71		09/02/98	GLS
Liquid Organic Extraction		-	COMP		08/28/98	CKV

Analytical No.: 47570

X = Analyzed but not detected.

Short Elliott Henderickson  
421 Frenette Drive  
Chippewa Falls , WI 54729

CUST NUMBER:  
SAMPLED BY: Client  
DATE REC'D: 08/27/98  
REPORT DATE: 09/04/98  
PREPARED BY: CKV  
REVIEWED BY: 

Attn: John Guhl

	Units	Reporting Limit	HP-2A 08/25/98	Qualifiers	Date Analyzed	By
<b>EPA 8310</b>						
Acenaphthene	µg/l	0.11	X		09/02/98	GLS
Acenaphthylene	µg/l	0.08	X		09/02/98	GLS
Anthracene	µg/l	0.03	2.77		09/02/98	GLS
Benzo (a) Anthracene	µg/l	0.06	8.06		09/02/98	GLS
Benzo (a) Pyrene	µg/l	0.06	12.4		09/02/98	GLS
Benzo (b) Fluoranthene	µg/l	0.03	8.04		09/02/98	GLS
Benzo (k) Fluoranthene	µg/l	0.03	3.03		09/02/98	GLS
Benzo (ghi) Perylene	µg/l	0.05	6.64		09/02/98	GLS
Chrysene	µg/l	0.04	X		09/02/98	GLS
Dibenzo (a, h) Anthracene	µg/l	0.06	1.33		09/02/98	GLS
Fluoranthene	µg/l	0.40	26.3		09/03/98	GLS
Fluorene	µg/l	0.04	X		09/02/98	GLS
Indeno (1, 2, 3-cd) Pyrene	µg/l	0.04	6.49		09/02/98	GLS
1-Methyl Naphthalene	µg/l	0.06	0.226		09/02/98	GLS
2-Methyl Naphthalene	µg/l	0.07	0.716		09/02/98	GLS
Naphthalene	µg/l	0.05	X		09/02/98	GLS
Phenanthrene	µg/l	0.08	7.63		09/02/98	GLS
Pyrene	µg/l	1.7	21.0		09/03/98	GLS
Liquid Organic Extraction		-	COMP		08/28/98	CKV


Analytical No.:

47571

X = Analyzed but not detected.



Short Elliott Henderickson  
 421 Frenette Drive  
 Chippewa Falls, WI 54729

CUST NUMBER:  
 SAMPLED BY: Client  
 DATE REC'D: 08/27/98  
 REPORT DATE: 09/04/98  
 PREPARED BY: CKV  
 REVIEWED BY: 

Attn: John Guhl

	Units	Reporting Limit	HP-3A 08/25/98	Qualifiers	Date Analyzed	By
<u>EPA 8310</u>						
Acenaphthene	µg/l	0.11	9.04		09/02/98	GLS
Acenaphthylene	µg/l	0.08	X		09/02/98	GLS
Anthracene	µg/l	0.6	20.1		09/03/98	GLS
Benzo (a) Anthracene	µg/l	1.2	35.4		09/03/98	GLS
Benzo (a) Pyrene	µg/l	1.2	27.2	CSL	09/03/98	GLS
Benzo (b) Fluoranthene	µg/l	0.6	29.0		09/03/98	GLS
Benzo (k) Fluoranthene	µg/l	0.03	11.2		09/02/98	GLS
Benzo (ghi) Perylene	µg/l	0.05	14.1		09/02/98	GLS
Chrysene	µg/l	0.8	45.5		09/03/98	GLS
Dibenzo (a, h) Anthracene	µg/l	0.06	3.26		09/02/98	GLS
Fluoranthene	µg/l	0.8	142.		09/03/98	GLS
Fluorene	µg/l	0.04	4.21		09/02/98	GLS
Indeno (1, 2, 3-cd) Pyrene	µg/l	0.04	16.2		09/02/98	GLS
1-Methyl Naphthalene	µg/l	0.06	3.09		09/02/98	GLS
2-Methyl Naphthalene	µg/l	0.07	9.06		09/02/98	GLS
Naphthalene	µg/l	0.05	X		09/02/98	GLS
Phenanthrene	µg/l	1.6	80.8		09/03/98	GLS
Pyrene	µg/l	3.4	88.1		09/03/98	GLS
Liquid Organic Extraction		-	COMP		08/28/98	CKV

Analytical No.:

47572

X = Analyzed but not detected.

# U.S. FILTER

UNITED STATES FILTER CORPORATION

Short Elliott Henderickson  
421 Frenette Drive  
Chippewa Falls , WI 54729

CUST NUMBER:  
SAMPLED BY: Client  
DATE REC'D: 08/27/98  
REPORT DATE: 09/04/98  
PREPARED BY: CKV  
REVIEWED BY: *[Signature]*


Attn: John Guhl

	<u>Units</u>	<u>Reporting Limit</u>	<u>MW-2 UNFILTERED</u> <u>08/25/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 7421</u> Lead (GFAAS)	µg/l	1.0	X		08/28/98	JCH
Analytical No.:			47573			

	<u>Units</u>	<u>Reporting Limit</u>	<u>MW-2 FILTERED</u> <u>08/25/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 7421</u> Sol. Lead (GFAAS)	µg/l	1.0	X		08/28/98	JCH
Analytical No.:			47574			

X = Analyzed but not detected.

Short Elliott Henderickson  
421 Frenette Drive  
Chippewa Falls , WI 54729

CUST NUMBER:  
SAMPLED BY: Client  
DATE REC'D: 08/27/98  
REPORT DATE: 09/04/98  
PREPARED BY: CKV  
REVIEWED BY: 

Attn: John Guhl

## Qualifier Descriptions

CSL	Check standard for this analyte exhibited a low bias. Sample results may also be biased low. Non-detects verified with a low standard comparison.
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# REQUEST FOR SERVICES

U.S. FILTER/ENVIROSCAN 301 W. MILITARY RD. ROTHSCHILD, WI 54474 1-800-338-SCAN

**REPORT TO:**

Name: John Gohl  
 Company: SEH  
 Address: 721 Fremont Dr  
Chippewa Falls, WI 54729  
 Phone: (715) 720-6225  
 P.O. # \_\_\_\_\_  
 Project # \_\_\_\_\_ Quote # \_\_\_\_\_  
 Location \_\_\_\_\_

**BILL TO: (if different from Report To info):**

Name: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Phone: ( \_\_\_\_\_ ) \_\_\_\_\_

**ANALYTICAL REQUESTS**

(use separate sheet if necessary)

- Sample Type**  
 (Check all that apply)
- Groundwater
  - Wastewater
  - Soil/Solid
  - Drinking Water
  - Oil
  - Vapor
  - Other

- Turnaround Time**
- Normal
  - Rush (Pre-approved by Lab)
- Date Needed 9-18-98 17 210412  
 Approved By \_\_\_\_\_

LAB USE ONLY	DATE	TIME	No. of Containers		SAMPLE ID	PAHs (E310)	Total Lead	Total Dissolved Lead	REMARKS
			COMP	GRAB					
14047569	8/25/98	10:40		1	MW-5	/	/	/	
14047570	8/25/98	11:00		1	HP-1A	/	/	/	
14047571	8/25/98	11:15		1	HP-2A	/	/	/	
14047572	8/25/98	11:30		1	HP-3A	/	/	/	
14047573	8/25/98	12:00		1	MW-2 (unfiltered)	/	/	/	
14047574	8/25/98	12:05		1	MW-2 (Filtered)	/	/	/	

Senchi

## CHAIN OF CUSTODY RECORD

SAMPLERS: (Signature)

*John E. Gohl*

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
<i>John E. Gohl</i>	8/26/98 9:00am	
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED FOR LABORATORY BY: (Signature)
		<i>[Signature]</i>
		DATE/TIME
		8-27-98 10:00

Del'v: Hand Comm  
 Ship. Cont. OK? Y N N/A  
 Samples leaking? Y N N/A  
 Seals OK? Y N N/A  
 Rec'd on ice? Y N N/A °C

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

November 3, 1998

Short Elliott Henderickson  
421 Frenette Drive  
Chippewa Falls, WI 54729

Attn: Trevor Bauer/ Cy Ingraham

Re: FRASE9401.00

Please find enclosed the analytical results for the samples received October 22, 1998.

All analyses were completed in accordance with appropriate EPA methodologies. Methods and dates of analysis are included in the report tables.

The chain of custody document is also enclosed.

If you have any questions about the results, please call. Thank you for using US Filter/Enviroscan for your analytical needs.

Sincerely,

US Filter/Enviroscan



Gary L. Scharrer  
Organic Laboratory Supervisor



Short Elliott Henderickson  
421 Frenette Drive  
Chippewa Falls , WI 54729


CUST NUMBER: FRASE9401.0  
SAMPLED BY: Client  
DATE REC'D: 10/22/98  
REPORT DATE: 11/03/98  
PREPARED BY: GLS  
REVIEWED BY: *[Signature]*

Attn: Trevor Bauer/ Cy Ingraham

	<u>Units</u>	<u>Reporting Limit</u>	<u>MW-2 10/20/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 7421</u>						
Lead (GFAAS)	µg/l	1.0	8.38		10/30/98	JCH
Sol. Lead (GFAAS)	µg/l	1.0	3.08		10/30/98	JCH
Analytical No.:			52826			



Short Elliott Henderickson  
 421 Frenette Drive  
 Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0  
 SAMPLED BY: Client  
 DATE REC'D: 10/22/98  
 REPORT DATE: 11/03/98  
 PREPARED BY: GLS  
 REVIEWED BY: 

Attn: Trevor Bauer/ Cy Ingraham

	<u>Units</u>	<u>Reporting Limit</u>	<u>MW-5 10/20/98</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<b>EPA 8310</b>						
Acenaphthene	µg/l	0.11	X		10/27/98	GLS
Acenaphthylene	µg/l	0.08	X		10/27/98	GLS
Anthracene	µg/l	0.03	X		10/27/98	GLS
Benzo (a) Anthracene	µg/l	0.06	X		10/27/98	GLS
Benzo (a) Pyrene	µg/l	0.06	X		10/27/98	GLS
Benzo (b) Fluoranthene	µg/l	0.03	X		10/27/98	GLS
Benzo (k) Fluoranthene	µg/l	0.03	X		10/27/98	GLS
Benzo (ghi) Perylene	µg/l	0.05	X		10/27/98	GLS
Chrysene	µg/l	0.04	X		10/27/98	GLS
Dibenzo (a, h) Anthracene	µg/l	0.06	X		10/27/98	GLS
Fluoranthene	µg/l	0.04	X		10/27/98	GLS
Fluorene	µg/l	0.04	X		10/27/98	GLS
Indeno (1, 2, 3-cd) Pyrene	µg/l	0.04	X		10/27/98	GLS
1-Methyl Naphthalene	µg/l	0.06	X		10/27/98	GLS
2-Methyl Naphthalene	µg/l	0.07	X		10/27/98	GLS
Naphthalene	µg/l	0.05	X		10/27/98	GLS
Phenanthrene	µg/l	0.08	X		10/27/98	GLS
Pyrene	µg/l	0.17	X		10/27/98	GLS
Liquid Organic Extraction		-	COMP		10/26/98	CKV

Analytical No.: 52827

X = Analyzed but not detected.

# REQUEST FOR SERVICES



**ENVIROSCAN SERVICES**

301 W. MILITARY RD.

ROTHSCHILD, WI 54474

1-800-338-SCAN

**REPORT TO:**

Name: Trevor Bauer  
 Company: SEH, Inc.  
 Address: 421 Frenette Drive  
Chippewa Falls, WI 54729  
 Phone: (715) 720-6237  
 P. O. # \_\_\_\_\_  
 Project # FRASE9401.00 Quote # 5909-7  
 Location \_\_\_\_\_

**BILL TO:** (if different from Report To info)

Name: Cy Ingraham  
 Company: SEH, Inc.  
 Address: 421 Frenette Drive  
Chippewa Falls, WI 54729  
 Phone: (715) 720-6231

**ANALYTICAL REQUESTS**

(use separate sheet if necessary)

**Sample Type**

(Check all that apply)

- Groundwater
- Wastewater
- Soil/Solid
- Drinking Water
- Oil
- Vapor
- Other

**Turnaround Time**

- Normal
- Rush (Pre-approved by Lab)

Date Needed 11-5-2004  
 Approved By \_\_\_\_\_

	<i>F-S-Pb</i>	<i>Lead - Dissolved</i>	<i>Lead - Total (742)</i>	<i>PAHs (8310)</i>	<i>LPN/A</i>	
✓	✓	✓				<b>REMARKS</b>

LAB USE ONLY	DATE	TIME	No. of Containers		SAMPLE ID
			COMP	GRAB	
	10/20/98				
13052826	↓	<del>12:30</del> 12:40	2		MW-2
13052827	↓	1:45	1		MW-5

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**CHAIN OF CUSTODY RECORD**

SAMPLERS: (Signature) <u>Trevor Bauer</u>			
RELINQUISHED BY: (Signature) <u>AS ABOVE</u>	DATE/TIME <u>10/19/98 17:00</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	
RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE/TIME <u>10/20/98 10:30</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	
RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE/TIME	RECEIVED FOR LABORATORY BY: (Signature) <u>[Signature]</u>	DATE/TIME <u>10-20-98 0840</u>

Del'v: Hand Comm	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shp. Cont. OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples leaking?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seals OK?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rec'd on ice?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Comments: For MW-2  
samples, 2 bottles  
dissolved = filtered  
total = unfiltered



February 2, 1999

SEH  
6418 Normandy Lane  
Suite 100  
Madison, WI 53719

Attn: Gloria Chojnacki

Re: FRASE9401.00

Please find enclosed the analytical results for the samples received January 26, 1999.

All analyses were completed in accordance with appropriate EPA methodologies. Methods and dates of analysis are included in the report tables.

The chain of custody document is also enclosed.

If you have any questions about the results, please call. Thank you for using US Filter/Enviroscan for your analytical needs.

Sincerely,

US Filter/Enviroscan



Gary L. Scharrer  
Organic Laboratory Supervisor

RECEIVED


FEB - 3 1999

SHORT ELLIOTT HENDRICKSON INC.  
MADISON





SEH  
6418 Normandy Lane  
Suite 100  
Madison, WI 53719

CUST NUMBER: FRASE9401.0  
SAMPLED BY: Client  
DATE REC'D: 01/26/99  
REPORT DATE: 02/02/99  
PREPARED BY: GLS  
REVIEWED BY: 

Attn: Gloria Chojnacki


	<u>Units</u>	<u>Reporting Limit</u>	<u>MW-2 UNFILTERED</u> <u>01/19/99</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 7421</u> Lead (GFAAS)	µg/l	1.0	1.49		02/02/99	JCH
Analytical No.:			61530			

	<u>Units</u>	<u>Reporting Limit</u>	<u>MW-2 FILTERED</u> <u>01/19/99</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 7421</u> Sol. Lead (GFAAS)	µg/l	1.0	ND		02/02/99	JCH
Analytical No.:			61531			

ND = Analyzed but not detected.



SEH  
6418 Normandy Lane  
Suite 100  
Madison, WI 53719

CUST NUMBER: FRASE9401.0  
SAMPLED BY: Client  
DATE REC'D: 01/26/99  
REPORT DATE: 02/02/99  
PREPARED BY: GLS  
REVIEWED BY: 

Attn: Gloria Chojnacki

	<u>Units</u>	<u>Reporting Limit</u>	<u>MW-5 01/19/99</u>	<u>Qualifiers</u>	<u>Date Analyzed</u>	<u>By</u>
<u>EPA 8310</u>						
Acenaphthene	µg/l	0.1	ND		01/29/99	GLS
Acenaphthylene	µg/l	0.1	ND		01/29/99	GLS
Anthracene	µg/l	0.09	ND		01/29/99	GLS
Benzo (a) Anthracene	µg/l	0.05	ND		01/29/99	GLS
Benzo (a) Pyrene	µg/l	0.04	ND		01/29/99	GLS
Benzo (b) Fluoranthene	µg/l	0.04	ND		01/29/99	GLS
Benzo (k) Fluoranthene	µg/l	0.06	ND		01/29/99	GLS
Benzo (ghi) Perylene	µg/l	0.06	ND		01/29/99	GLS
Chrysene	µg/l	0.05	ND		01/29/99	GLS
Dibenzo (a, h) Anthracene	µg/l	0.1	ND		01/29/99	GLS
Fluoranthene	µg/l	0.06	ND		01/29/99	GLS
Fluorene	µg/l	0.07	ND		01/29/99	GLS
Indeno (1, 2, 3-cd) Pyrene	µg/l	0.07	ND		01/29/99	GLS
1-Methyl Naphthalene	µg/l	0.09	ND		01/29/99	GLS
2-Methyl Naphthalene	µg/l	0.08	ND		01/29/99	GLS
Naphthalene	µg/l	0.08	ND		01/29/99	GLS
Phenanthrene	µg/l	0.08	ND		01/29/99	GLS
Pyrene	µg/l	0.11	ND		01/29/99	GLS
Liquid Organic Extraction		-	COMP		01/27/99	CKV

Analytical No.:

61532

ND = Analyzed but not detected.

# REQUEST FOR SERVICES



**ENVIROSCAN SERVICES**

301 W. MILITARY RD.

ROTHSCHILD, WI 54474

1-800-338-SCAN

**REPORT TO:**

Name: ~~SEH~~ Gloria Chojnaeki  
 Company: SEH  
 Address: 6418 Normandy Lane, Ste. 100  
Madison, WI 53719  
 Phone: (608) 274-2020  
 P. O. # \_\_\_\_\_  
 Project # FRASE9401.00 Quote # 5909  
 Location Superior, WI

**BILL TO:** (if different from Report To info)

Name: \_\_\_\_\_  
 Company: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Phone: (\_\_\_\_) \_\_\_\_\_

**ANALYTICAL REQUESTS**  
 (use separate sheet if necessary)

- Sample Type**  
 (Check all that apply)
- Groundwater
  - Wastewater
  - Soil/Solid
  - Drinking Water
  - Oil
  - Vapor
  - Other

**Turnaround Time**

- Normal
- Rush (Pre-approved by Lab)

Date Needed 2-7-99 2:00 PM  
 Approved By \_\_\_\_\_

LAB USE ONLY	DATE	TIME	No. of Containers		SAMPLE ID	LEAD	PAH	REMARKS
			COMP	GRAB				
17061530	1-19-99	12:30	1		MW-2 Unfiltered			LEAD
17061531	1-19-99	12:40	1		MW-2 Filtered			PAH
17061532	1-19-99	1:30	1		MW-5			LEAD PAH

SEHMAD

Del'v: Hand Comm	<input checked="" type="checkbox"/>	N	N/A
Shp. Cont. OK	<input checked="" type="checkbox"/>	N	N/A
Samples leaking?	<input checked="" type="checkbox"/>	N	N/A
Seals OK?	<input checked="" type="checkbox"/>	N	N/A
Rec'd on ice?	<input checked="" type="checkbox"/>	N	N/A °C

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## CHAIN OF CUSTODY RECORD

SAMPLERS: (Signature) John E. Gelf

RELINQUISHED BY: (Signature) <u>John E. Gelf</u>	DATE/TIME <u>1-25-99 9:00</u>	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED FOR LABORATORY BY: (Signature) <u>Kevin M. Andrews</u>

DATE/TIME  
1-26-99 10:00