



George E. Meyer
Secretary

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

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September 19, 1994

Ronald Peterson
Fraser Shipyards, Inc.
Third Street and Clough Avenue
Superior, Wisconsin 54880

FID# 816047210
HW/LIC
Douglas County
WID#046706453

RE: Review of Fraser Shipyard Site Investigation and Closure Plan.

Dear Mr. Peterson:

Short Elliott Hendrickson, Inc. submitted a Site Investigation Report and Closure Plan for Fraser Shipyards, Inc., On May 31, 1994. On July 19, 1994, the report was resubmitted with the review fees and a modified cover sheet with the changes required in a Department letter from a June 1994 letter. The report was not intended to be a true closure plan but was looking for interim decisions from the Department on goals of various areas of concern.

The following are some general comments regarding the Investigative report.

1. SEH should submit all the QA/QC data along with the sample results.
2. It was understood that if contamination were encountered at the water table a ground water monitoring system will be installed and ground water would be sampled to determine the degree of impact. Review of information submitted in the closure plan, shows that contamination does occur at the water table, therefore plans for placement of wells should be submitted to the Department for review.
3. In the work plan, informally approved by the Department in of 1993, procedures to define the degree and extent of contamination were described. The degree and extent of contamination must be defined before a site can be closed.
4. NR 685.05, Wis. Adm. Code Requires that all tanks used to treat or store hazardous waste be cleaned of all residue.
5. If contamination is to be left in place, an explanation of why it is not practical to remove it should be given. It is not acceptable to use values in the table of proposed NR 720, Wis Adm. Codes for simple sites. Fraser Shipyard facility is a complex site, and maximum allowable contamination left in place should be calculated using the formula in proposed NR 720 for complex sites.



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6. All site must be closed under hazardous waste authority. It is acceptable to use LUST guidance on AOCs which look to be petroleum contamination only and do not exhibit any characteristic of a hazardous waste.
7. Five copies of future submittal will be sent to the Department. Three to the Bureau of Solid and Hazardous Waste, and two to the area specialist Steve LaValley.

The following are Departments comments on specific parts of the report.

Section 1.0 SITE HISTORY:

There is no information provided which would indicate how long, possible violations of Wisconsin's Hazardous waste laws have occurred.

Section 2.0 SITE GEOLOGY:

The report states "Shallow groundwater was encountered in several borings at depths ranging from 2.5 to 6.0 feet. The boring were ground water was encountered should be clearly identified.

Section 2.1

Fraser Shipyards is located on Howards Bay, which is part of the St. Louis River and located within a half mile of Lake Superior. s. 29.015(n)(o)(p), Wis. Stats.

Section 3.0 SITE INVESTIGATION:

SEH carried out the minimum approved sampling on all but one of the 14 AOC identified. Samples for AOC #11 which is the base of Dry dock one were collected and should have been submitted in August. It is recommended that Fraser halt further construction of Dry dock one until these results are submitted and a review can take place.

3.1/4.1 AOC#1: Waste Oil Storage Area

The site was investigated by advancing 6 borings. Two of the borings were conducted for VOC analysis. The analytical results state that "The chromatogram also contained significant peaks outside window", and "The Chromatogram is not distinct for diesel." A mass spectrometer should be run which would identify the peaks outside the DRO analysis. Fraser shipyards must identify the peaks outside the DRO range.

The investigation failed to identify the extent of contamination. Two of the 4 borings have DRO levels in excess of maximum allowable for soils at simple sites. Fraser will have to

take action to remediate this site if it can not present reasonable justification that it is not practical to do so. Further the extent of contamination must be identified.

3.2/4.2 AOC#2: Grit Waste Stockpile Area

The investigation of this site consisted of collecting one grab sample. This sample was analyzed for total metals and showed elevated lead. The site was used to store spent sandblasting grit generated by removing paint and rust from ships at Fraser. Fraser mixed grit which testing showed to be hazardous waste with other spent grit to render the waste nonhazardous (This constitutes illegal treatment of a hazardous waste). Where the remaining material is probably not a hazardous waste, the plan fails to define the degree and extent of impact and fails to justify leaving contamination in place. I have seen no indication that 461ug/g would be considered background concentrations. At a minimum the closure plan should justify leaving lead contaminated soils in place. Levels in proposed NR 720.09 (1), Wis. Adm. Code are for simple sites. Fraser shipyards site is considered a complex site and site specific number must be generated using proposed NR 720.19, Wis. Adm. Code.

3.3/4.3 AOC#3: Dirty Solvent Staging Area

This area was investigated by advancing two shallow bore holes. Samples from the bore holes again showed elevated DRO levels. Because F listed waste were stored at this site a remedial action plan is proposed. The action plan should identify peaks which showed on the DRO gas chromatogram outside the DRO range. The plan shall also identify the extent of contamination.

3.4/4.4 AOC#4: Bilge Water Staging Area

Samples were collected from the soil water interface and showed low level contamination. The Department will not require any further action at this time.

3.5/4.5 AOC#5: Paint Waste Storage Area

This area was surveyed by advancing 4 borings, analyzing them for VOCs and metals. Lead level were extremely high. It should be determined if these elevated levels of lead are impacting ground water. Again specific clean up numbers and justification for leaving contamination should be presented and the extent of contamination identified.

3.6/4.6 AOC#6: 600KVA Substation

One boring was placed at the site and a soil sample was analyzed for DRO and screened using an amino assay PCB kit. Analysis revealed no contamination. Because of the harsh condition and limitation of the PCB kits copies of the field log books showing how the test kit were used should be submitted. If the log books show that the requirements of the test kits were met then no further action is required at this AOC at this time.

3.7/4.7 AOC#7: Transformer Staging Area

Three boring were placed in AOC #7. The samples were analyzed for DRO and PCBs. The results show elevated DRO but no PCBs. Comments are the same as in AOC #1.

3.8/4.8 AOC #8: Paint Room Storage Pad

Two boring were placed to determine the degree of contamination. Analysis of the two soil samples show low level VOC's and elevated metals. The extent of contamination has not been determined nor has it been shown that it is not practicable to remove the contamination which does exist.

3.9/4.9 AOC #9: Fuel Storage Area

One boring was placed and a soil sample was collected and analyzed for DRO. The analysis showed elevated levels. Fraser's needs to identify the extent of contamination. The analysis showed 163ug/g which exceeds the 100 ppm for simple sites. Fraser will at a minimum need to define the extent and justify why it is not possible to remediate.

3.10/4.10 AOC #10: Upper Landing of Dry Dock #1

Shallow soils cover the structure which makes up the dry dock. This made it impossible to place boring so 8 grab samples were collected. The two with elevated FID readings were analyzed for VOCs and metals. The analysis reveled low level impacts. Shows low level impact justify leaving in place.

3.11 AOC #11: Dry Dock #1

The investigation was deferred until it was feasible for SEH to conduct the investigation. Fraser is in the process of repairing Dry Dock #1. The investigation should be carried out and contamination removed before this work is completed and it becomes necessary to remove parts of the concrete structure to remediate the site.

3.12/4.12 AOC #12: Northwest Fill Area

The area was investigated by digging 4 test pits with a backhoe. Three samples were collected and analyzed for VOC revealing low level Toluene contamination. The fill material is described as concrete, wood, and scrap metal. It was not determined when this material was placed but it was placed in violation of NR 500.08, and constitutes an illegal disposal of a solid waste since the site does not meet the requirements in the clean fill exemption of the solid waste regulations. Fraser should explain were the toluene contamination is coming from. Until this is explained the site is not closed and the Department may require additional work.

3.13/4.13 AOC #13: Southeast Fill Area

Four test pits were placed to investigate this area of concern. Based on FID field screening no lab analysis was conducted on soils from these test pits. Observations show that untreated wood, brick, scrap metal, and other solid waste were placed in this site illegally.

3.14/4.14 AOC #14: Howards Bay

Four cores were taken of sediment in Howards Bay to supplement the grab samples collected by the Department and SEH, Fraser's consultants. The analysis of these samples show a relatively thin layer of heavily impacted sediments.

Fraser has proposed no further action because the impacts were not intentional nor do they exhibit a hazardous characteristic. The investigation reveals concentrations of lead decrease the further you get from the dry dock implicating Fraser as the source of the contamination. Further, the release may not have been intentional and they currently may not fail TCLP for lead, but tests conducted on Drydock waste by the DNR showed it was characteristic hazardous waste for lead. The sediments non the less are impacted to the point of having a significant impact on aquatic life. Therefore Fraser should submit a plan to remediate impacted sediments in Howards Bay. I have included guidance from Lee Liebenstein.

If you have any questions regarding this letter or wish to discuss this or other hazardous waste issues please call me at 392-7831.

Sincerely,



Steven LaValley
Solid and Hazardous Waste Specialist

c: Dave Kafura/Mary Bell Pratt/Gary LeRoy- Spooner
Tim Mulholland - SW/3
Lee Liebenstein - WR/2

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: June 13, 1994

TO: Steve LaValley - SW/Superior

FROM: Lee Liebenstein - WR/2 *Tom Janisch for*

SUBJECT: Preliminary response to request for guidance on sediment remediation goals in Howards Bay

We are currently drafting a response to your April 7, 1994 memo. Your memo was delayed in reaching me. Below is some preliminary information that may be useful to you in discussions with Fraser Shipyard representatives.

Based on the sediment data you provided and using benchmark sediment quality guidelines related to impacts to benthic organisms, we are in the process of doing a screening level ecological risk assessment (SLRA) for the site. The screening level ecological risk assessment makes a number of simplifying, conservative assumptions to identify the potential metals of concern and to estimate the risks. Preliminary information from the SLRA is shown in the attached table. The measured concentrations of metals at the site are compared with two sets of sediment quality guidelines - Ontario and NOAA. Each set of guidelines has an upper and lower effects level. The lower guideline number is supposed to be protective of the majority of benthic macroinvertebrate species. Generally as the concentration for a metal in sediment increases from the lower to upper value, more benthic species will be detrimentally impacted (reproduction, growth, mortality). When the upper guideline values are met or exceeded, a pronounced disturbance of the sediment dwelling community is expected.

In the table, exceedances of either set of guideline values are noted for copper, chromium, lead, mercury, and zinc. Evaluation of all available sampling data for the St. Louis River System AOC (approx. 400 sediment samples) would appear to indicate that reference or background site sediment concentrations for Cu and Cr exceed the Lowest Effect Levels from the Ontario guidelines. For reasons to be discussed in the completed SLRA, Cu and Cr levels are not believed to be impacting benthic organisms. The levels of lead, mercury, and zinc are believed to pose a risk to benthic organisms. In the case of lead, a significant risk is believed to exist.

Hazard Quotients (HQ) were calculated and are shown in the attached table. The HQ shows the relative risk posed by each of the metals to benthic organisms. The range of HQ in the table for each metal are based on dividing the minimum and maximum metal concentrations in site surface sediments by the Lowest Effect Level value from the Ontario guidelines. HQs based on average metal concentrations in site sediments for lead, mercury, and zinc are 6.9, 2.2, and 1.3 respectively.

The lead concentration in Howard's Bay sediments are some of the highest found for the St. Louis River AOC based on available data. The only higher value was one hit of 720 mg/kg we found in the Newton Creek impoundment. Other sites with high lead values in sediments were found at the two Superfund sites on the Minnesota side of the river (230-368 mg/kg upper range values) and in the sediment at the WLSSD POTW outfall (334 mg/kg). All of these latter sites have been identified in the RAP as sites of concern needing further assessment and remediation as necessary.

Preliminarily from available data, it appears that lead contamination in sediment from clean unimpacted sites in the system ranges from 10-25 mg/kg. The average lead concentration in 379 sediment samples taken historically is 33 mg/kg. The samples were taken at a number of locations all over the AOC from sites variously influenced by anthropogenic sources.

RECOMMENDATIONS:

Our recommendations based on the identified potential risks posed by the metals, especially lead, in site sediments is to move to a second tier which includes completing a more comprehensive risk assessment process to define the site specific magnitude and circumstances of risk. This would involve the collection of additional site-specific chemical and biological data. The data would be collected under what is called the Sediment Quality Triad Assessment Approach. This approach integrates measures of sediment chemistry, toxicity and bioaccumulation testing, and in-field studies such as benthic community structure. The Triad approach can be used to attempt to demonstrate if metals at elevated levels are causing pollution-induced degradation of sediments and to establish at what levels various detrimental effects are occurring.

Please contact me at (608) 266-0164 if you have any questions or want to arrange to discuss details of the Triad components.

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cc: T. Mulholland/E. Lynch - SW/3
T. Janisch - WR/2
T. Smith - NWD

Table ____ Screening Level Ecological Risk Assessment for Impact to Benthic Organisms

	Howard's Bay Sediment mg/kg		Ontario Sediment Quality Guidelines				NOAA Sediment Quality Guidelines				
	Ave	Range	Lowest Effect Level mg/kg	No. of Exceedances	Severe Effect Level mg/kg	No. of Exceedances	Effect Range Low mg/kg	No. of Exceedances	Effect Range Median mg/kg	No. of Exceedances	Hazard Quotient
Arsenic	4.4	3.8-5.2	6	0/6	33	0/6	33	0/6	85	0/6	0
Cadmium	1	1	1.1*	0/6	10	0/6	5	0/6	9	0/6	0
Chromium	38	36-41	31*	6/6	110	0/6	80	0/6	145	0/6	*
Copper	51	34-72	25*	6/6	110	0/6	70	0/6	390	0/6	*
Lead	215	39-503	31	6/6	250	4/14	35	6/6	110	10/14	1.9-16.2
Mercury	0.44	0.23-1.2	0.2	8/8	2	0	0.15	8/8	1.3	0	1.2-6
Nickel	No Data		31	—	75	—	30	—	50	—	0
Zinc	153	110-180	120	5/6	820	0/6	120	5/6	270	0/6	0.9-1.4

$$\text{Hazard Quotient} = \frac{\text{Concentration in Site Surface Sediments (Min - Max)}}{\text{Lowest Effect Level in Ontario Sediment Quality Guidelines}}$$

Guidelines for the Protection and Management of Aquatic Sediment Quality in Ontario. Ontario Ministry of Environment. August 1993.

NOAA (National Oceanic and Atmospheric Administration) The Potential for Biological Effects of Sediment - Sorbed Contaminants Tested in the National Status and Trends Program. August 1991.

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1.4