Remedial Investigation Report

Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

Prepared for
Mercury Marine Division
of Brunswick Corporation

Prepared by

CH2M HILL

April 8, 1993

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Section 1

Introduction

This report presents the results of a focused soil and groundwater assessment conducted by CH2M HILL for Mercury Marine at its former Plant No. 1 location in Cedarburg, Wisconsin. This work was performed in response to a Wisconsin Department of Natural Resources (DNR) request that Mercury Marine investigate potential releases of chlorinated solvents from its former plant.

The scope of services for this work are presented in *Work Plan for Remedial Investigation* (June 15, 1992). The work plan was prepared by CH2M HILL on behalf of Mercury Marine. The work plan was approved by DNR in November 1992.

Site Background and History

Mercury Marine's Plant No. 1 was located at N49 W6337 Western Road in Cedarburg, Wisconsin (Figure 1-1). Mercury Marine manufactured outboard motors and other small engine-driven devices at the plant. The plant began operation in 1939. As part of the overall manufacturing process, metal cleaning was performed using TCE in an above ground steel vapor degreasing tank located in the northwest corner of the building (Figure 1-2). The tank was replaced in 1977 with a similar tank. Both tanks were about 3 feet by 5 feet by 6 feet. The tank had drains to allow collection and onsite distillation of TCE for reuse in degreasing operations. It is reported that the degreaser was drained and cleaned about once per year. In the late 1970s, the tank was moved to the location shown in Figure 1-2. No other uses of chlorinated solvents at the plant were reported by the former employees.

Mercury Marine sold Plant No. 1 to Scot Pump in the early 1980s. Scot is the current owner of the property.

Previous Investigations

There have been three previous DNR studies of VOC contamination at the Cedarburg municipal wells:

- The initial VOC analysis of the public water supply in 1982
- Periodic water quality monitoring by the City of Cedarburg and the DNR from 1982 to the present
- The DNR investigation in 1989/90 by Strand Associates

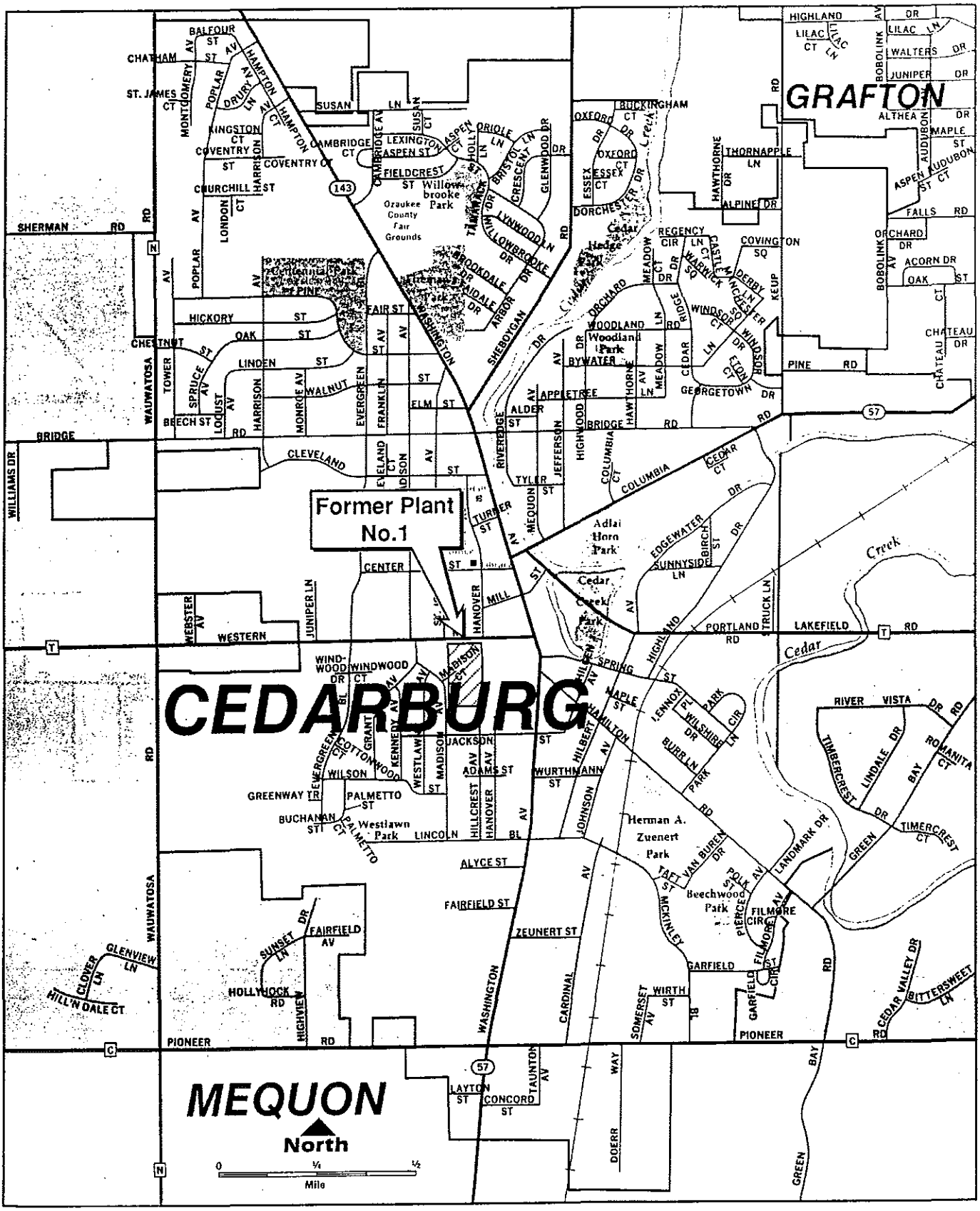

FIGURE 1-1
Vicinity Map
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

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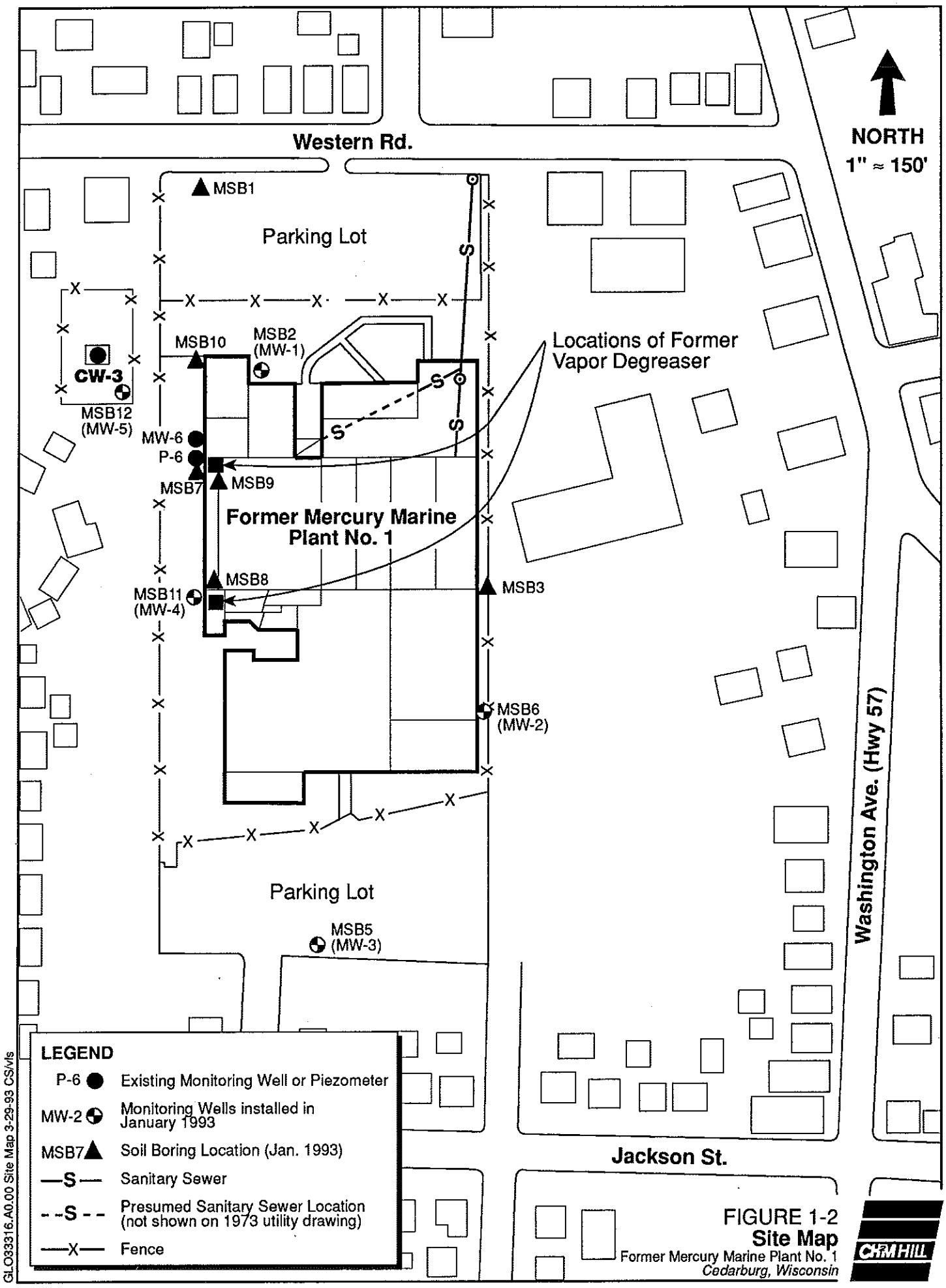
GLO33316.A0.00 Vicinity Map 2-22-93 lml



GLO33316.A0.00 Site Map 3-29-93 CS/vls

FIGURE 1-2
Site Map
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

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The 1982 DNR groundwater quality study was part of a broader survey of the overall public water supply system entitled *Report on An Investigation of the Cedarburg Public Water Supply.* The report notes that three VOCs—TCE, 1,2-dichloroethene (1,2-DCE), and p-dichlorobenzene—were detected in samples from "the four deep wells," apparently referring to City Wells No. 1, 3, 4, and 5. The report suggests that all four wells were contaminated and does not distinguish between them. The report states broadly that "contaminants appear widely dispersed in low concentration in the deep aquifers."

Since January 1982, water from City Wells No. 3 and 5 (referred to herein as CW-3 and CW-5) has been sampled by both the DNR and the City of Cedarburg. Data from those sampling events were included in the Strand report *Cedarburg Groundwater Investigation* (February 1990). Results show that TCE was detected consistently in almost every sample from CW-3 and CW-5. TCE concentrations were typically less than 10 μg/L, but some measurements were in the range of 10 to 50 μg/L. The single maximum concentration reported was 89 μg/L at CW-5. The 1,2-DCE was detected in only about 15 percent of the samples from CW-3 and 30 percent from CW-5. The reported concentration of 1,2-DCE was less than 5 μg/L in all samples.

In 1989, the DNR assigned Strand to investigate the contamination of the groundwater supply in Cedarburg. Strand's report was entitled *Cedarburg Groundwater Investigation Existing Conditions Report.* The purpose of the study was to develop information on the local hydrogeology and the sources and extent of VOC contamination at CW-3 and CW-5. The overall investigation scope consisted of a review of historic data, an assessment of historic and current land uses for potential contaminant sources, soil borings and sampling, a soil gas survey, groundwater monitoring well installation, groundwater recovery duration measurements, pump testing of CW-3, and chemical analysis of soil, gas, and groundwater for chlorinated VOCs. The report concluded with recommendations for further investigation. The Strand report contained the following conclusions:

- The water table is within the glacial till or weathered dolomite in the vicinity of CW-3.

- The Niagara aquifer (unconsolidated and dolomite bedrock) appears to have such low vertical hydraulic conductivity that the shallower unconsolidated aquifer behaves independently of the deeper Niagara aquifer.

- When the city production well pumps are off, it is possible that contaminated groundwater could cascade down the inside of the wells and enter the sandstone aquifer.

- At the former Mercury Marine Plant No. 1 site, chlorinated VOCs were measured in the shallow groundwater at concentrations ranging from 90 to 5,000 μg/L and in bedrock at a concentration of 260 μg/L of TCE. Of the compounds identified, TCE was detected at the highest concentration.

- The potential for further contamination of the Niagara aquifer was considered to be high, and the potential for contamination of the sandstone aquifer was noted.

Scope of Work Summary

As part of the work conducted by CH2M HILL, results of the previous investigations were reviewed including the Donohue Report on *Remedial Actions for VOC Control at Well No. 3 and Well No. 5, Cedarburg, Wisconsin* (March 1987) and miscellaneous correspondence. Upon completing this review, three major technical issues requiring resolution were identified:

- Because of insufficient data, hydraulic connection between Well No. 3 and Well No. 5 was not demonstrated during the pump tests conducted by Donohue.

- Reported VOC concentrations have consistently been higher at Well No. 5 than at Well No. 3 suggesting the potential for multiple VOC sources.

- It is not clear whether the presence of chlorinated VOCs in the Niagara dolomite in the vicinity of Plant No. 1 is caused by migration from the surficial aquifer or from some other migration pathway.

To address these issues, CH2M HILL designed the field investigation program with the following objectives:

- Evaluate groundwater flow direction in the upper aquifer (glacial till) under static and dynamic conditions relative to operation of City Well No. 3

- Calculate the expected range of hydraulic influence caused by Wells No. 3 and 5

- Determine the degree and extent of VOC contamination originating from the former Mercury Marine Plant No. 1

The methodology and results of the site investigation are described in the following sections.

Section 2
Site Investigation

A detailed summary of work performed during the site investigation is presented in Appendix A, Technical Memorandums No. 1 and 2. A brief summary of the work performed is presented below.

Soil Borings

Twelve borings were drilled to provide stratigraphic and hydrogeologic information as well as physical and chemical soil characteristics. The borings were advanced to bedrock using 4.25-inch hollow stem augers and were continuously sampled at 2-foot intervals using 3-inch split spoon samplers. Figure 2-1 shows the locations of the borings. Soil samples were logged by the onsite CH2M HILL hydrogeologist. Cuttings were placed in U.S. DOT-approved 55-gallon drums and stored onsite pending disposal.

At 4 of the 12 borings (MSB6, MSB7, MSB10, and MSB11), drilling continued into competent bedrock using air rotary drilling methods. A 10-foot long rock core was obtained from the bedrock surface at borings MSB7, MSB10, and MSB11. At boring MSB6, 10-foot long rock cores were collected from 20 to 60 feet below ground surface. The cores were logged by a CH2M HILL hydrogeologist.

Two of the 12 borings (MSB8 and MSB9) were advanced to the weathered dolomite in the areas of the former vapor degreaser inside the building. Borings MSB7 and MSB11 were advanced 10 feet into bedrock along the western perimeter of the building adjacent to the two former locations of the degreaser.

Soil Sampling

Soil samples were collected for chemical analyses from 6 of the 12 borings: MSB8, MSB9, MSB10, MSB11, and MSB12 (see Figure 2-1). A 3-inch split spoon sampler was driven at 2-foot intervals. A minimum of one soil sample was collected from each stratigraphic unit present in the unconsolidated formation. Samples were submitted for VOC and TOC analyses based on field screening results and/or visual appearance. Samples not submitted for analyses were disposed of in a 55-gallon drum and stored onsite pending disposal.

For those boreholes not chemically sampled, HNu screenings were done on the split-spoon sample immediately following opening of the spoon. Readings were recorded on the soil boring logs.

It was proposed in the work plan that a total of 4 soil samples would be collected from the inside borings for physical characterization. Because of the stiff, often gravelly, till encountered in the subsurface and due to the size of the electric rig used for drilling, it was not possible to push a shelby tube to collect soil samples for physical analyses. However, a total of 3 Shelby tube samples were obtained from two borings (MSB7 and MSB11) just outside the west side of the building. Physical samples were submitted to PAL for grain size, moisture content, and porosity analyses. The boring location and depth interval of the samples submitted are listed in Table TM1-1 in Appendix A.

For those borings in which monitoring wells were not installed, the borehole was abandoned using either bentonite chips or bentonite-cement grout. Bentonite-cement grout was used for the abandonment of the borings inside the plant building.

Monitoring Well Installation

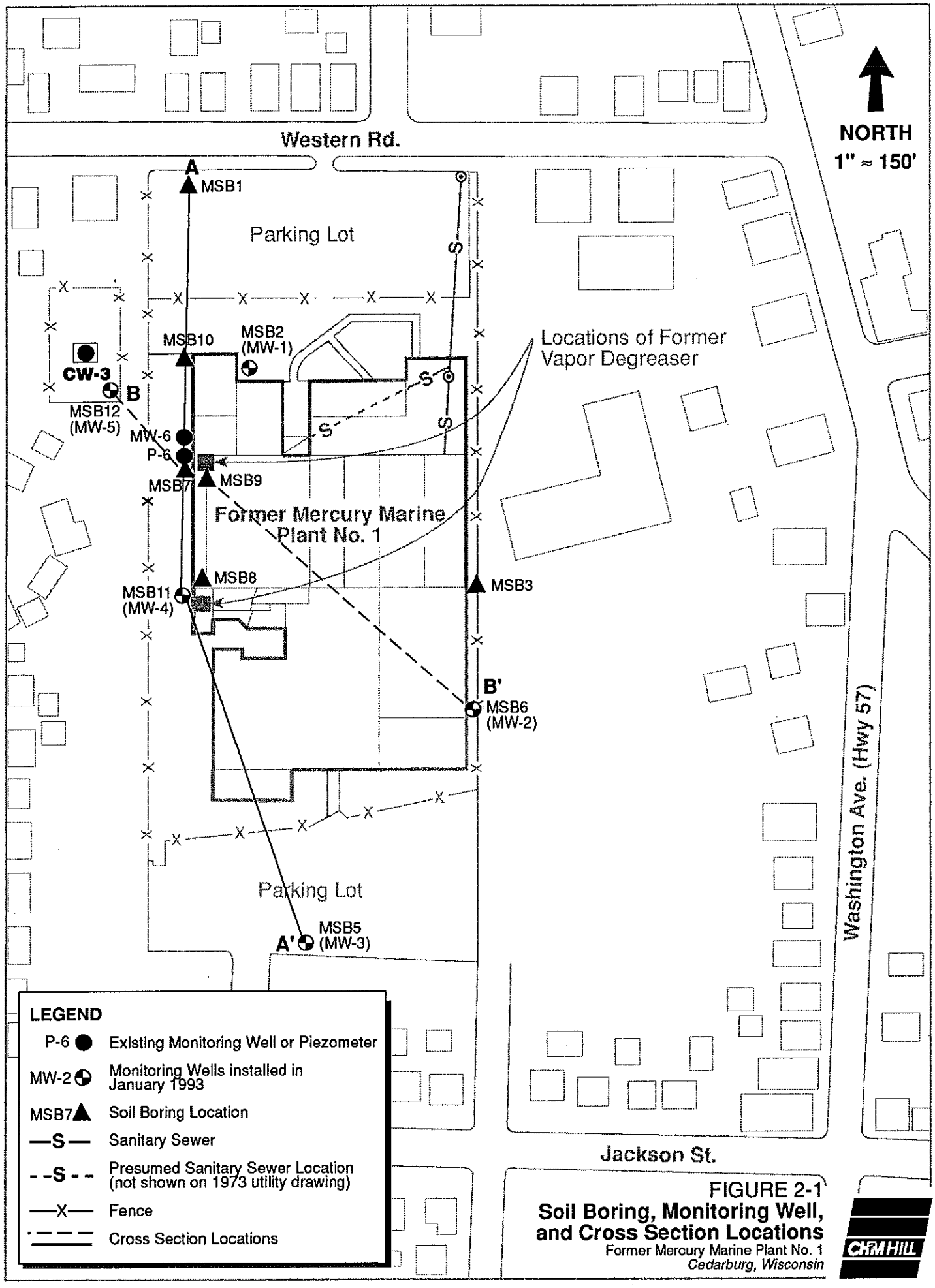
Five monitoring wells were installed at the locations depicted in Figure 2-1. The wells were installed to provide information on the groundwater flow direction in both the glacial till and bedrock.

In the *Work Plan for Remedial Investigation*, CH2M HILL had proposed that piezometers be installed at 7 of the 12 borings (MSB1, MSB2, MSB3, MSB4, MSB5, MSB6, and MSB12). Nested piezometers were to have been installed at borings MSB4 and MSB6. Water was not encountered in the glacial till at MSB4 and MSB6; therefore, drilling at MSB6 continued into bedrock to 60 feet below ground surface and a monitoring well was installed with a 15-foot screen to insure the screening of a productive water-bearing zone. Water was also not encountered in borings MSB1 and MSB3. A monitoring well was installed in MSB11 on the western perimeter of the building to provide a monitoring point at that location. The well was constructed with a 10-foot screen to intercept several sand lenses. Wells were constructed with 2-inch Schedule 40 PVC riser and 0.010-inch factory-slotted screen. Specific monitoring well construction details are presented in Technical Memorandum No. 1 in Appendix A.

The soil borings and monitoring wells were located by CH2M HILL personnel. Horizontal locations were surveyed to the nearest foot. Ground elevations for the borings and the top of well casings were surveyed to the nearest 0.01 foot.

Groundwater Grab Sampling

To characterize groundwater quality in the immediate vicinity of Plant No. 1, groundwater grab samples were collected from the glacial till from 6 of the 12 borings: MSB2, MSB5, MSB7, MSB9, MSB11, and MSB12. In addition, grab samples were collected from the dolomite at 4 borings: MSB6, MSB7, MSB10, and MSB11. See Figure 2-1 for boring locations. Grab samples were to have been collected from all 12



GLO33316.A0.00 Cross Section Location 3-29-93 CS/vls

FIGURE 2-1
Soil Boring, Monitoring Well, and Cross Section Locations
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

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borings; however, water was not encountered in the glacial till at 6 of the borings. After a boring was advanced to the top of bedrock, the augers were pulled back about 3 feet and a PVC screen and riser were dropped down inside the augers to the bottom of the borehole. Where drilling continued into the dolomite, the water sample was collected from within the borehole casing.

A stainless-steel bailer was used to purge a minimum of 3 well volumes. Several boreholes went dry after a limited amount of purging and were allowed to recover before sampling began. Purge water was collected in 5-gallon buckets and emptied into 55-gallon drums. The drums were stored onsite pending disposal.

After purging the well, water samples were collected with a stainless steel bailer. Specific sampling details are presented in Technical Memorandum No. 2. Samples were submitted for analysis of VOCs, alkalinity, hardness, TOC, COD, and iron. The bailers were decontaminated between sampling locations.

City Well No. 3 Pump Test

Following installation of the monitoring wells, CH2M HILL coordinated with City of Cedarburg Water Department to monitor water levels in both the glacial till and the dolomite during periods when City Well No. 3 was idle and when it was operating. The purpose of the test was to evaluate the effect of Well No. 3 on groundwater flow direction in the glacial till and to estimate the radius of influence of Well No. 3 in the dolomite.

The city well was shut down for 14 days beginning on February 10, 1993. Water levels were measured 4 times during that period to confirm steadiness of the elevations prior to turning the well pump back on. An electric tape was used to measure water levels. On February 24, CW-3 was turned back on and ran periodically for 7 days at a rate of 960 gpm. CW-3 (along with CW-5) pumps groundwater to booster pumps which feed to the air stripper at CW-5. Both city wells cycle off and on in response to the water levels in the booster pumps, and may pump for as short a period as 20 minutes before shutting off.

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Section 3

Investigation Results

Site Physical Characteristics

Information obtained during this investigation and supplemented with work done by others in and around the Cedarburg area was used to develop a conceptual model that describes the physical conditions underlying the Plant No. 1 site. Understanding the physical system is fundamental to understanding the movement and behavior of constituents potentially released as a result of past plant operations. As described in the following sections, the local geology in the vicinity of Plant No. 1 is particularly complex, which complicates the interpretation of analytical data generated by this and previous investigations.

Soils and Geology

Boring logs compiled during the site investigation supplemented with information from previous investigative work (Strand, 1990) were used to prepare cross sections of the geology beneath former Plant No. 1. Cross section locations are presented in Figure 2-1. The cross sections are presented as Figures 3-1 and 3-2.

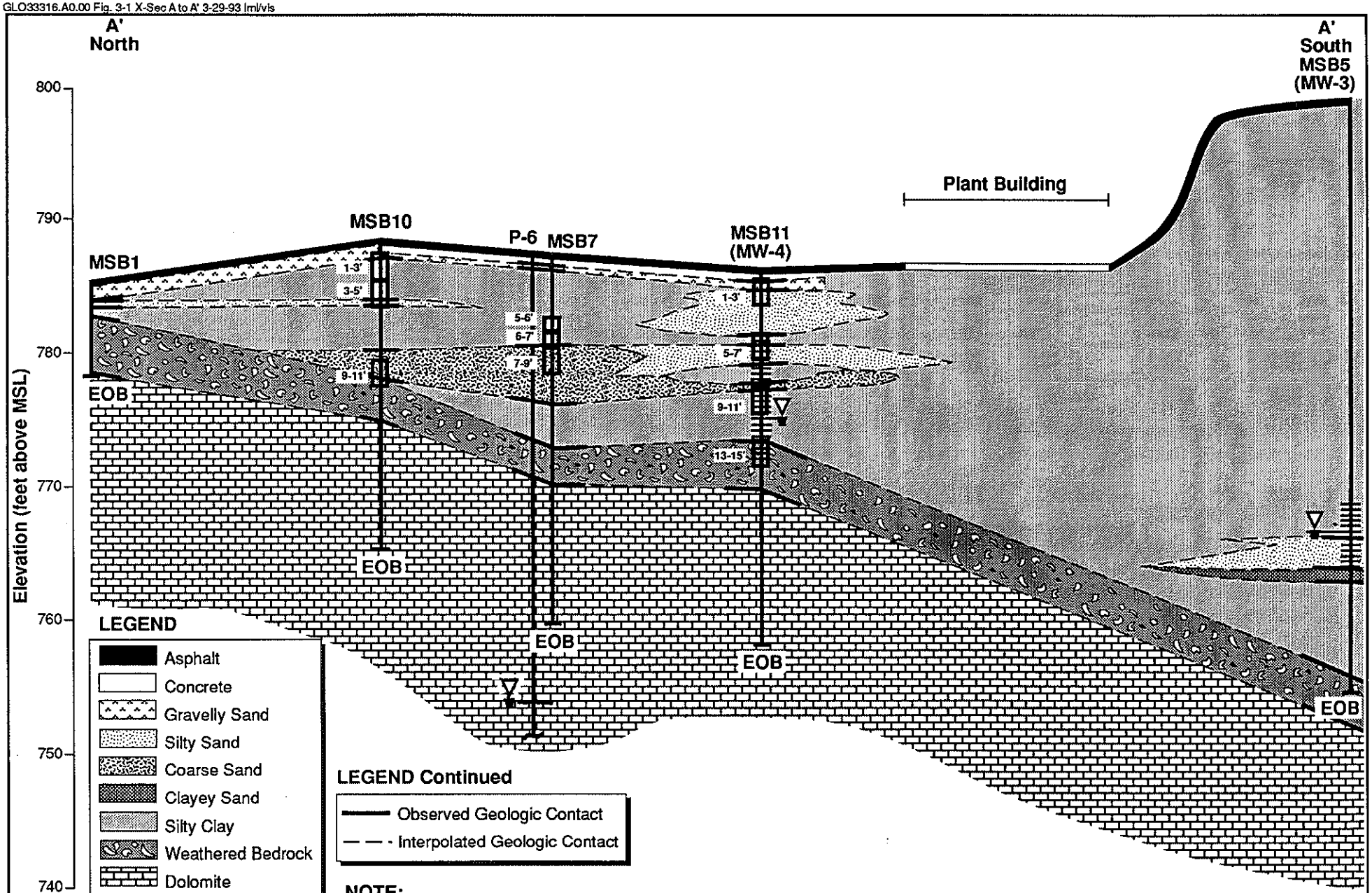
Examining the cross sections shows that the site is generally underlain by reddish-brown, silty-clay soil of variable thickness interspersed with discontinuous lenses of silty and course sand. This sequence has been interpreted to be glacial till. Figure 3-1 shows that the till ranges in thickness from about 3 feet at the northwest corner of the site (MSB01) to 44 feet at the southern property boundary (MSB05).

Some black cinders and bits of coal were detected in the upper 2 to 3 feet at borings MSB07, MSB10, and MSB11, and some thin copper wires were also detected within the upper 3 feet at MSB10 indicating that filling may have taken place along the western side of the building.

A well-graded sand lens is present beneath the western edge of the main plant building as determined from observations and samples collected from borings MSB07, MSBS08, MSB09, MSB10, and MSB11. The top of the lens occurs at a depth of about 7 feet below grade and ranges in thickness from 2 feet at MSB10 to the north to greater than 4 feet at MSB07 and then grades to a silty sand interbedded with silty clay at MSB11. The presence of a sand lens is typical of glacial till.

The till soils are underlain by highly weathered dolomite bedrock that in places is filled with a silt or silty clay matrix. The weathered unit is generally about 5 feet thick and appears to become more competent with depth. Rock cores collected at borings MSB06, MSB07, MSB10, and MSB11 indicate the more competent dolomite is buff to grey, fine-grained, massively bedded and only slightly weathered. Rock quality designators (RQDs)

GLO33316.A0.00 Fig. 3-1 X-Sec A to A' 3-29-93 lml/vls



NOTE:

The depth and thickness of the subsurface strata indicated on the section were generalized from and interpolated between test borings. Information on actual subsurface conditions exists only at the specific locations and dates indicated. Soil (rock) conditions and water levels at other locations may differ from conditions occurring at the boring locations.

SCALE
1" = 100' Horizontal
1" = 10' Vertical

FIGURE 3-1
Geologic Cross Section A to A'
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

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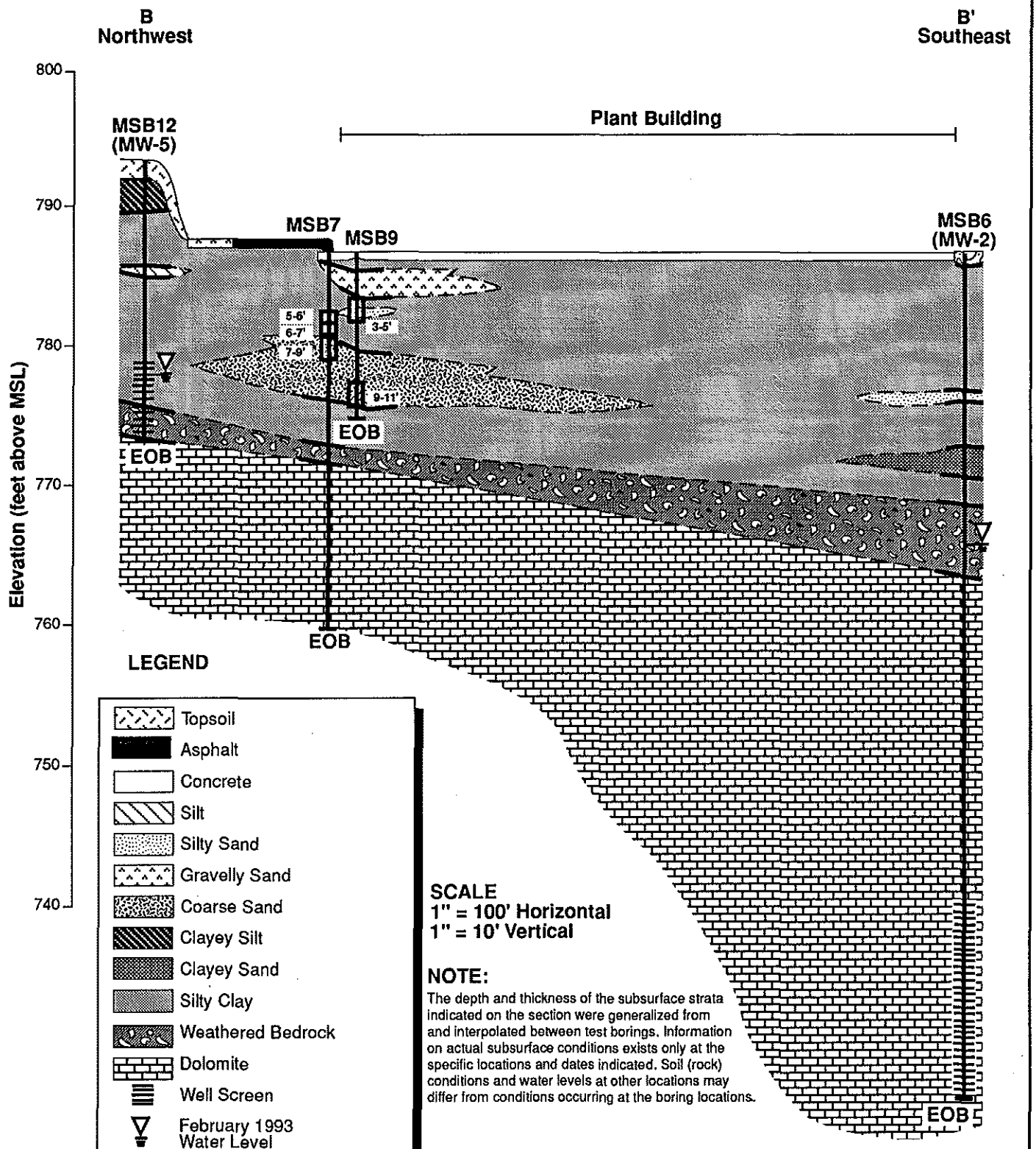

FIGURE 3-2
Geologic Cross Section B to B'
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

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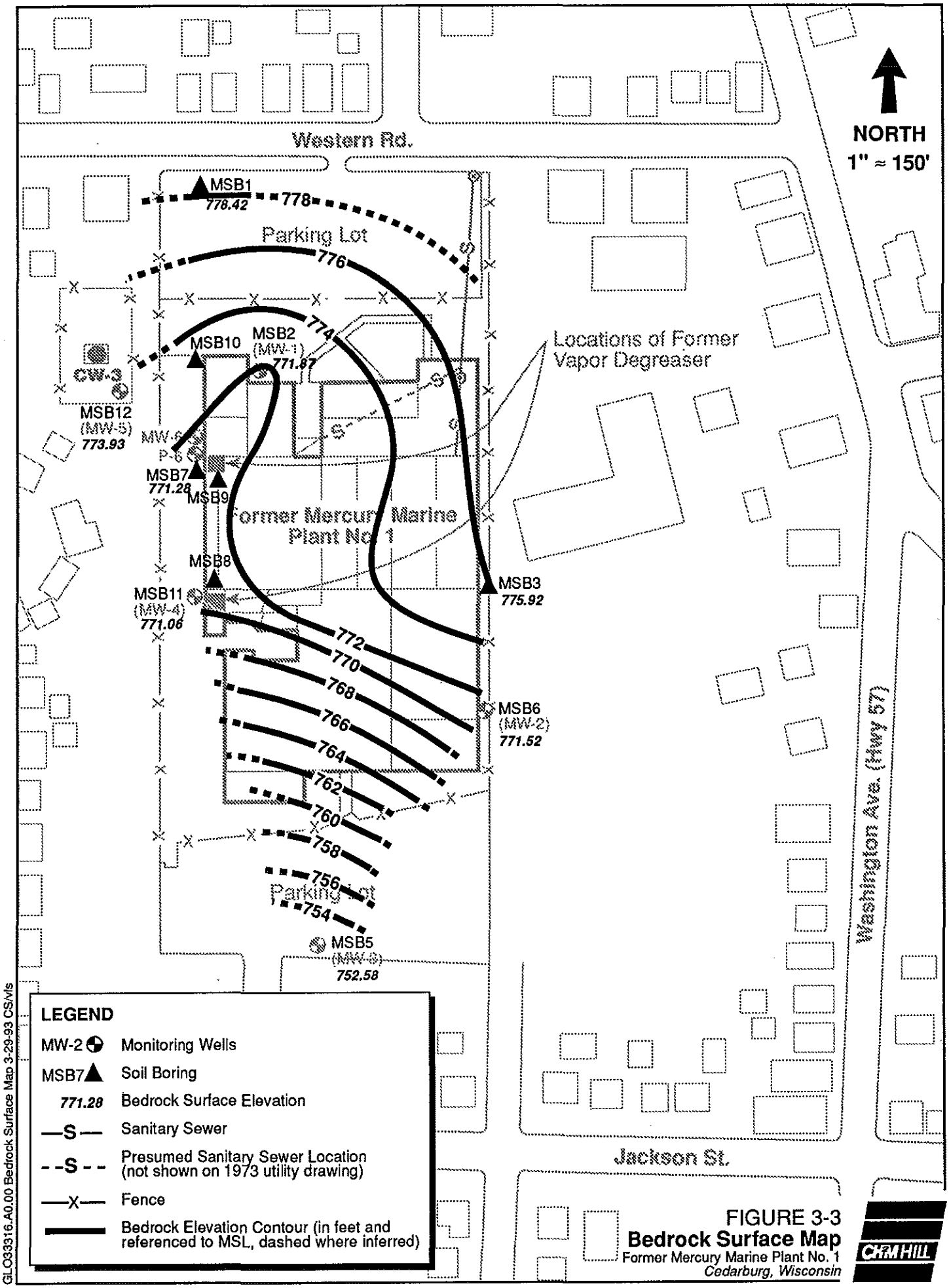
are greater than 50 percent for the upper 10 feet cored indicating only moderate fracturing and increase to greater than 80 percent with depth indicating proportionally less fracturing. Some vertical and horizontal hairline fracturing of the cores was observed at angles of 0°, 45°, and 90°. Many of the larger fractures exhibited calcite infilling.

The bedrock surface is fairly flat over the northern half of the site but dips to the south-southwest at a slope of about 4 percent as shown in Figures 3-1 and 3-2 and the bedrock surface contour map presented as Figure 3-3. The elevation of the bedrock surface decreases from about 770 feet above mean sea level at MSB11 to about 753 feet at MSB05, a change of 17 feet over a distance of 430 feet.

Hydrogeology

Groundwater levels were measured in both newly installed and existing till and bedrock monitoring wells on several occasions in February and March, 1993. Water levels collected on February 9 (from all wells except P-6) were used to construct the water level contour map (Figure 3-4), which is generally representative of water level conditions observed over the time frame of the study. The water levels are listed in Table TM2-1 in Appendix A. The groundwater contours indicate that the general direction of groundwater flow is to the south-southeast at a gradient of 0.023 ft/ft. These data suggest that the till, weathered bedrock, and the upper portions of the more competent bedrock (at least to a depth of 60 feet) are hydraulically connected and under water table conditions. Depending on the depth to bedrock, the water table may occur in either the till or bedrock. For example, groundwater was not encountered in the till at MSB06 where the top of weathered bedrock is at an elevation of about 769 feet and the water table occurs 3 feet below the bedrock surface at an elevation of 766 feet. In contrast, the water table was encountered in the till at MSB05 at about the same elevation as at MSB06 (766 feet) but the elevation of the bedrock surface is about 756 feet, 13 feet lower than at MSB06 and 10 feet below the water table.

Although the data are very limited, the following observations on the connection between shallow groundwater and the deep bedrock groundwater can be made. Data from piezometer P-6, which was completed (by others) at a depth of 160 feet below grade shows water levels markedly lower (on the average 13 to 23 feet lower) than those in the other wells. Figure 3-5 is a plot of water levels over time in the nested well pair MW-6/ P-6 installed previously by Strand. MW-6 is completed at the bedrock till interface at a depth of about 26 feet. P-6 is completed in competent bedrock at a depth of 160 feet. An initial explanation for the pronounced differences in water level would be a strong downward vertical gradient (0.16 ft/ft) indicating downward flow from MW-6 to P-6. Such an interpretation would also explain the presence of TCE in P-6. However, examining Figure 3-5, it is apparent that there is little correlation between the water levels in the two wells over the period record. If there is hydraulic communication between the till/upper bedrock aquifer and the lower portions of the bedrock, it would be expected that the water levels in the two wells would show similar trends, which is not the case.



GLO33316.A0.00 Bedrock Surface Map 3-29-93 CS/vls

FIGURE 3-3
Bedrock Surface Map
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

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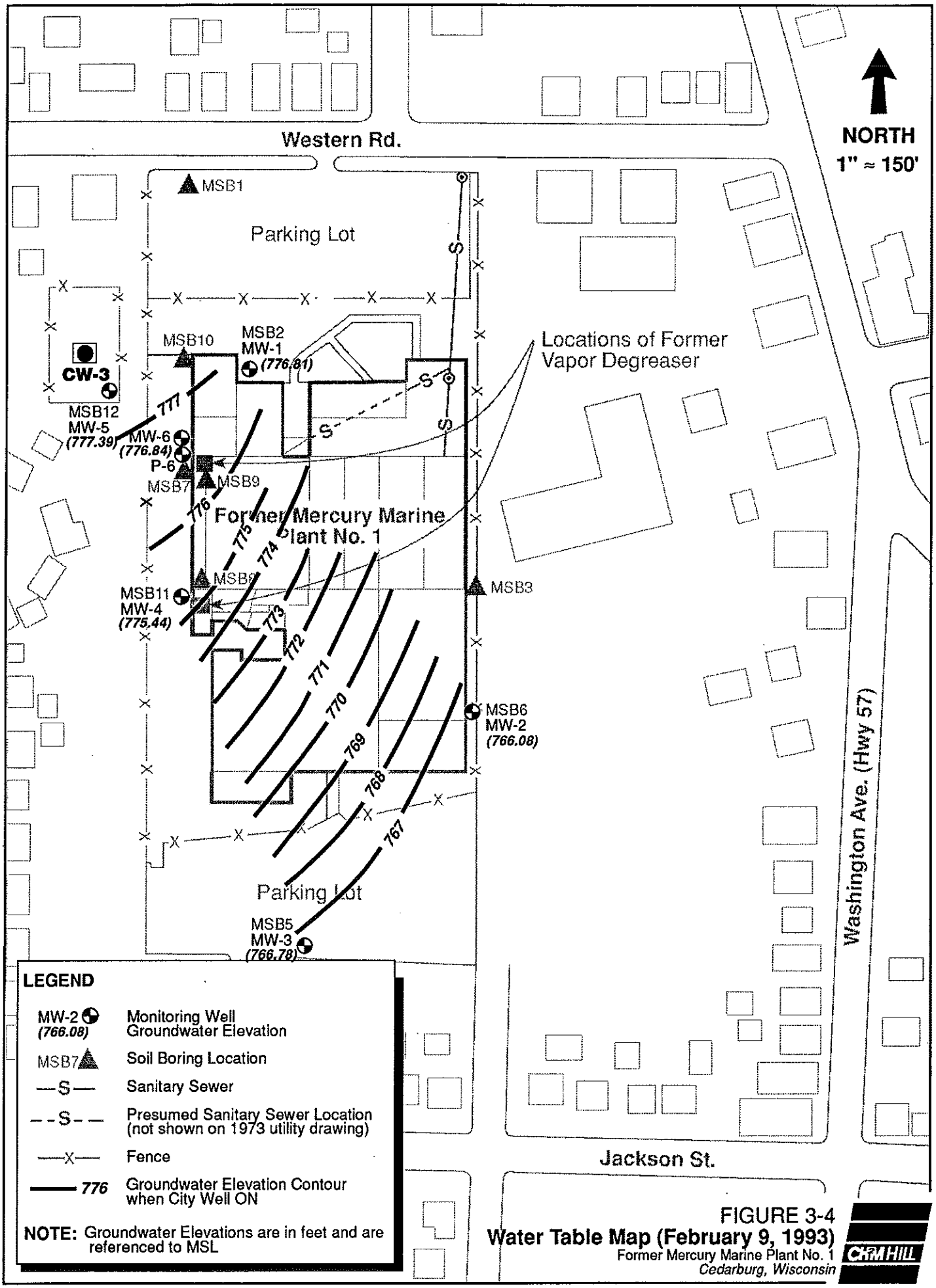

GLO33316.A0.00 Groundwater Elevations 3-29-93 CS/vls

FIGURE 3-4
Water Table Map (February 9, 1993)
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

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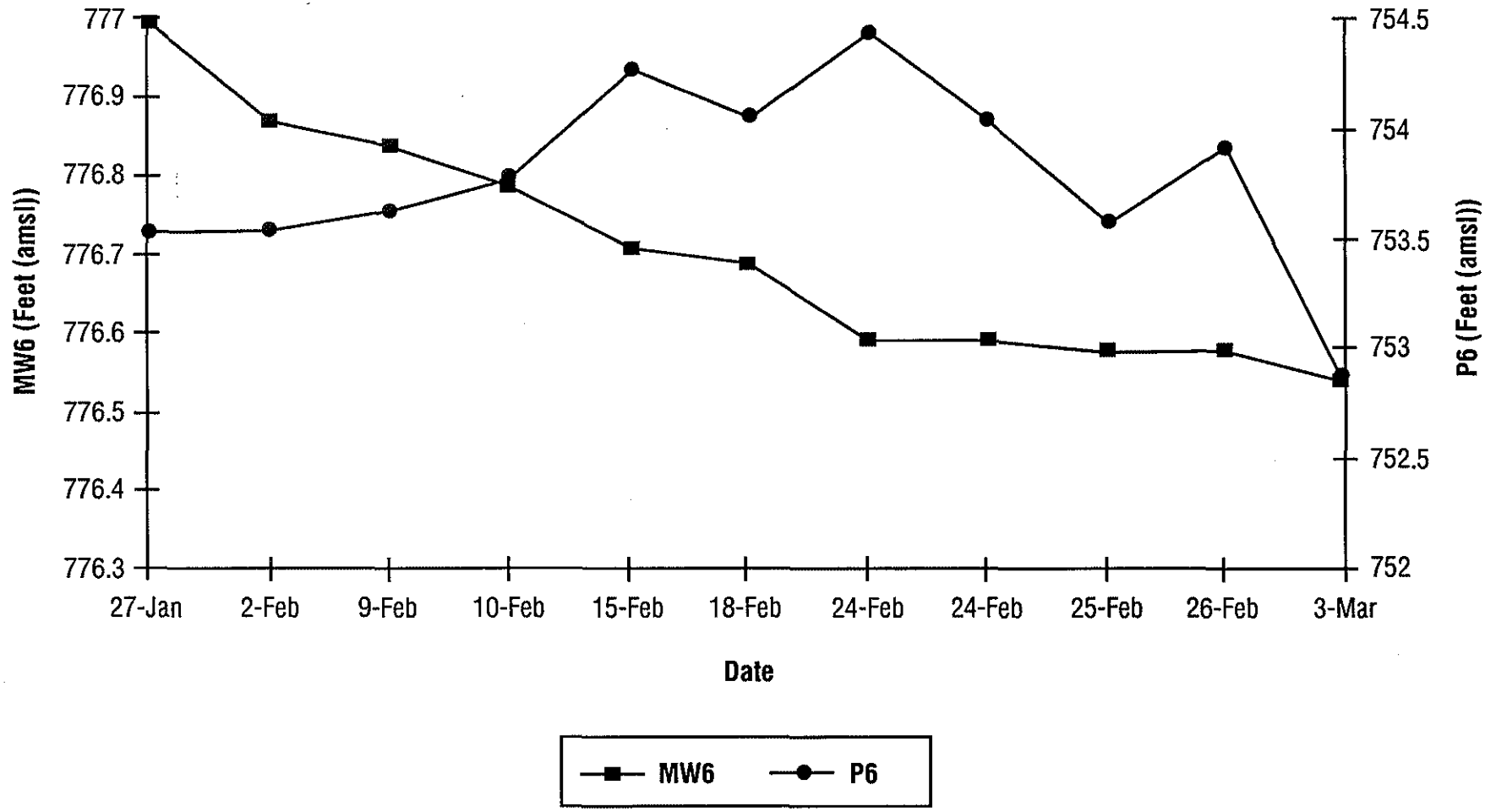

FIGURE 3-5
Water Level Relationship MW6/P6
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

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GLO33316.A9.00 Water Level Rel. 3-5 4-1-93 cs

Further evidence of the lack of communication between the two zones is the observed change (or lack thereof) in water levels in response to pumping City of Cedarburg water supply well No. 3 (CW-3). As part of this work assignment, CH2M HILL coordinated with the City of Cedarburg to alter the pumping schedule of CW-3 so that responses in the monitoring wells installed around Plant No. 1 could be observed over time. The purpose of this exercise was to determine whether pumping at CW-3 affected the direction of shallow groundwater flow in the vicinity of Plant No. 1 and thereby investigate the possibility of a migration mechanism whereby chlorinated VOCs present in the soils and shallow groundwater in the vicinity of Plant No. 1 were a source of the chlorinated VOCs present in CW-3.

CW-3 was turned off between February 10 and February 24 after which time pumping resumed. When operating, CW-3 typically pumps at a rate of 900 gpm. Water levels were periodically recorded in the monitoring wells before, during, and after CW-3 was shut down. A plot of these water levels is presented in Figure 3-5 along with the pumping schedule of CW-3. As can be seen from examining Figure 3-5, there does appear to be some response to CW-3 in piezometer P-6 (screened in the deeper bedrock unit 160 feet below grade), but there is no apparent response in MW-6. Beginning on February 10 when CW-3 was turned off, the water level in P-6 begins to rise noticeably and continues to rise through February 24 when pumping in CW-3 resumed. Beginning on February 24 water levels in P-6 begin to fall noticeably and generally continue to decline over the period of record. This pattern suggests that pumping at CW-3 affects the potentiometric levels in the deeper portions of the bedrock aquifer. No such response is observed in MW-6 or any of the other monitoring wells including MW-2, which is completed in bedrock at a depth of 60 feet. Over the period of record for this study, the direction of groundwater flow in the till/upper bedrock aquifer has remained consistently to the south-southeast.

This pattern further supports the statement made above that the till/upper bedrock aquifer behaves independently and does not appear to be hydraulically connected to lower portions of the bedrock aquifer, at least in the immediate vicinity of Plant No. 1. Such a relationship on a local scale is not that unusual in a fractured bedrock environment. While it is evident at a regional scale (Young and Batten, 1980) that saturated unconsolidated deposits overlying the Silurian dolomite behave as a single aquifer under water table conditions, locally, different portions of the bedrock may be somewhat hydraulically isolated from each other. In fractured bedrock environments, the degree of hydraulic communication between different bedrock strata is a function of the density, continuity and orientation of the various fracture sets that occur within the rock matrix. These relationships are demonstrated schematically in Figure 3-6.

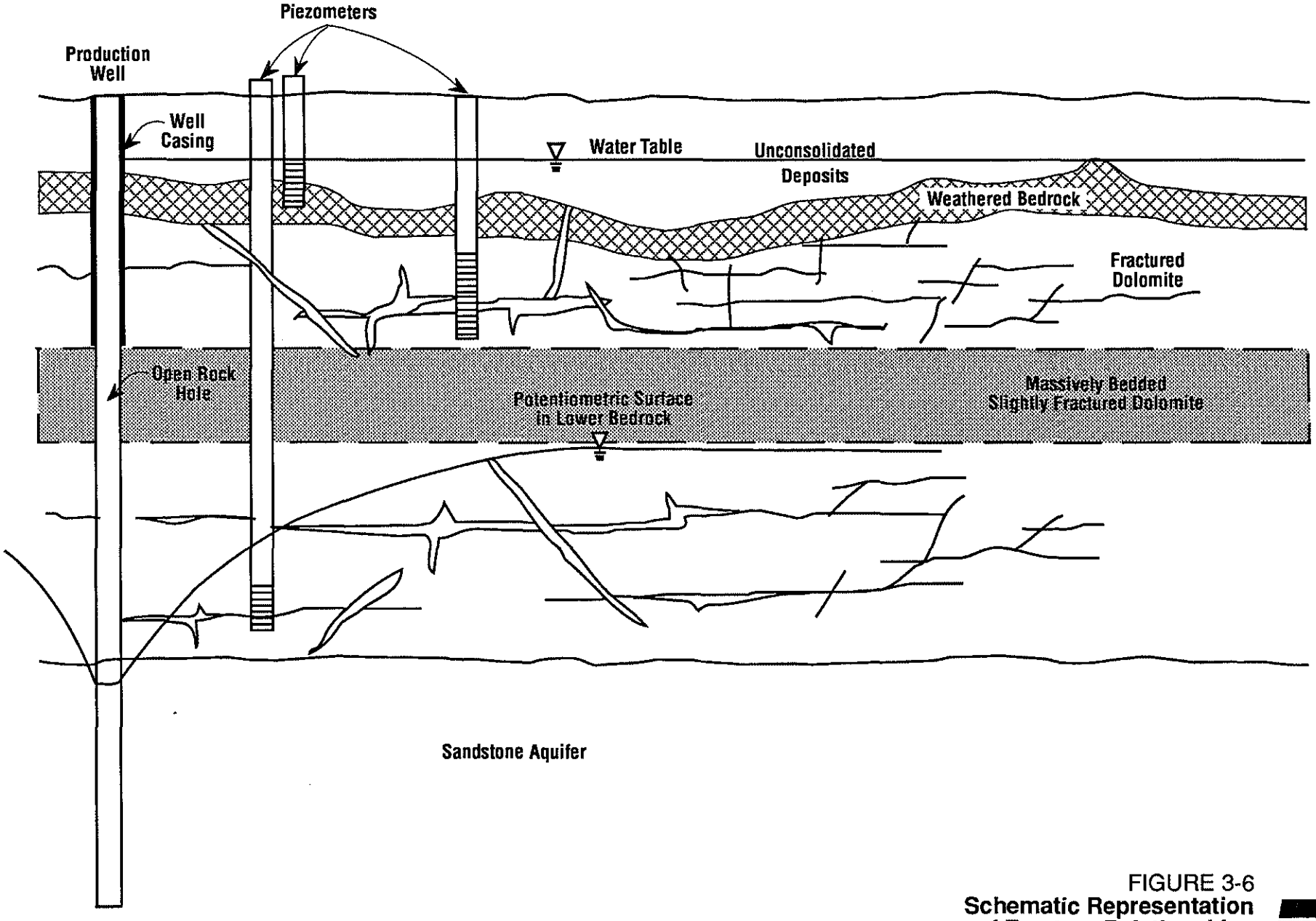


FIGURE 3-6
Schematic Representation of Fracture Relationships
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

GLO33316.A0.00 Fracture Schematic 4-1-93 cs

Analytical Results

Soil

Soil samples were collected from borings MSB07, MSB08, MSB09, MSB10, and MSB11 and were analyzed for VOCs and TOC. Several VOCs were detected in the samples. The compounds detected and their concentrations are shown in Table 3-1.

Trichloroethene (TCE) was detected in soil samples from all five borings. Concentrations ranged from 1.9 μg/kg at MSB11 (located outside the plant building to the west of where the former vapor degreaser was located after the late 1970s) to 580 μg/kg at MSB08 (located inside the building just to the north of the location where the degreaser was located after the late 1970s). The highest concentrations were found at those borings adjacent to the former locations of the vapor degreaser.

Some greenish-black discoloration of sand was observed at depths of 6 to 15 feet in borings MSB07, MSB08, MSB09, MSB10, and MSB11. The absence of odor and low readings on the HNu (2 to 6 ppm) plus the inconsistent presence of VOCs in the samples collected where this discoloration occurred suggest that the discoloration may be due to the presence of sulfide minerals rather than contamination.

The VOC concentrations with respect to depth at each boring are shown in Figure 3-7. Other VOCs detected in several of the samples were cis-1,2-dichloroethene (1,2-DCE), 1,1-dichloroethane (1,1-DCA), and 1,1,1-trichloroethane (1,1,1-TCA). The concentrations and locations where these compounds were detected are also depicted in Figure 3-8. 1,1-DCA and 1,2-DCE concentrations were highest at MSB08 at 9.8 μg/kg and 38 μg/kg, respectively. 1,2-DCE is a common degradation product of TCE while 1,1-DCA is a degradation product of 1,1,1-TCA. 1,1,1-TCA was detected at MSB08 and MSB11 at concentrations of 100 and 103 μg/kg, respectively.

Total petroleum hydrocarbon compounds (TPH) were detected at MSB07 from 5 to 6 feet below the surface. The soil at this interval was a silty clay with some black staining and had a noticeable petroleum odor. This was the only location sampled where the black staining and odor was detected.

Groundwater

Groundwater grab samples were collected from the glacial till at borings MSB02, MSB05, MSB07, MSB09, MSB11, and MSB12 (Figure 3-1). Grab samples were also collected from the bedrock at borings MSB06, MSB07, MSB10, and MSB11. The depths at which the samples were obtained and the analytical results are presented in Table 3-2.

Table 3-1
Soil Analytical Results
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

Sample Location:	MSB07	MSB07	MSB07	MSB08	MSB08	MSB09	MSB09	MSB10	MSB10	MSB10	MSB11	MSB11-FR	MSB11	MSB11	MSB11
Sample Interval:	5 to 6	6 to 7	7 to 9	8 to 10	10 to 12	3 to 5	9 to 11	1 to 3	3 to 5	9 to 11	1 to 3	1 to 3	5 to 7	9 to 11	13 to 15
Sample Date:	1/22/93	1/22/93	1/22/93	1/20/93	1/20/93	1/21/93	1/21/93	1/22/93	1/22/93	1/22/93	1/25/93	1/25/93	1/25/93	1/25/93	1/25/93
Volatiles, µg/kg															
1,1-Dichloroethane	< 1.2	< 4.9	< 4.8	< 1	**9.8**	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	**4.4**	**9.2**	< 1.1
cis-1,2-Dichloroethene	**2**	< 4.9	< 4.8	< 1	**38**	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	**8.4**	**18**	< 1.1
Tetrachloroethene	< 1.2	< 4.9	< 4.8	< 1	< 5	< 1.3	**21**	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	**8.5**	< 1.1
1,1,1-Trichloroethane	< 1.2	< 4.9	< 4.8	**100**	< 5	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	**65**	**103**	< 1.1
Trichloroethene	**57**	**92**	**180**	**130**	**580**	**100**	**150**	< 1.2	< 1.1	**7.5**	**1.9**	< 1.2	**44**	**69**	< 1.1
n-Butylbenzene	**3.9**	< 4.9	< 4.8	< 1	< 5	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	< 1.2	< 1.1
sec-Butylbenzene	**8.0**	< 4.9	< 4.8	< 1	< 5	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	< 1.2	< 1.1
tert-Butylbenzene	**8.4**	< 4.9	< 4.8	< 1	< 5	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	< 1.2	< 1.1
Isopropylbenzene	**3.1**	< 4.9	< 4.8	< 1	< 5	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	< 1.2	< 1.1
p-Isopropyltoluene	**3.7**	< 4.9	< 4.8	< 1	< 5	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	< 1.2	< 1.1
n-Propylbenzene	**3.1**	< 4.9	< 4.8	< 1	< 5	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	< 1.2	< 1.1
1,2,4-Trimethylbenzene	**6.7**	< 4.9	< 4.8	< 1	< 5	< 1.3	< 5.2	**3.8 R**	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	< 1.2	< 1.1
1,3,5-Trimethylbenzene	**1.3**	< 4.9	< 4.8	< 1	< 5	< 1.3	< 5.2	< 1.2	< 1.1	< 1.1	< 1.2	< 1.2	< 1.2	< 1.2	< 1.1
TOC (mg/kg)	7500	520	430	510	1200	430	370	1400	400	510	3900	3200	380	320	8.3

Bold type indicates compound detected above method detection limit.
R indicates deficiencies in analytical data and actual presence of compound is questionable.

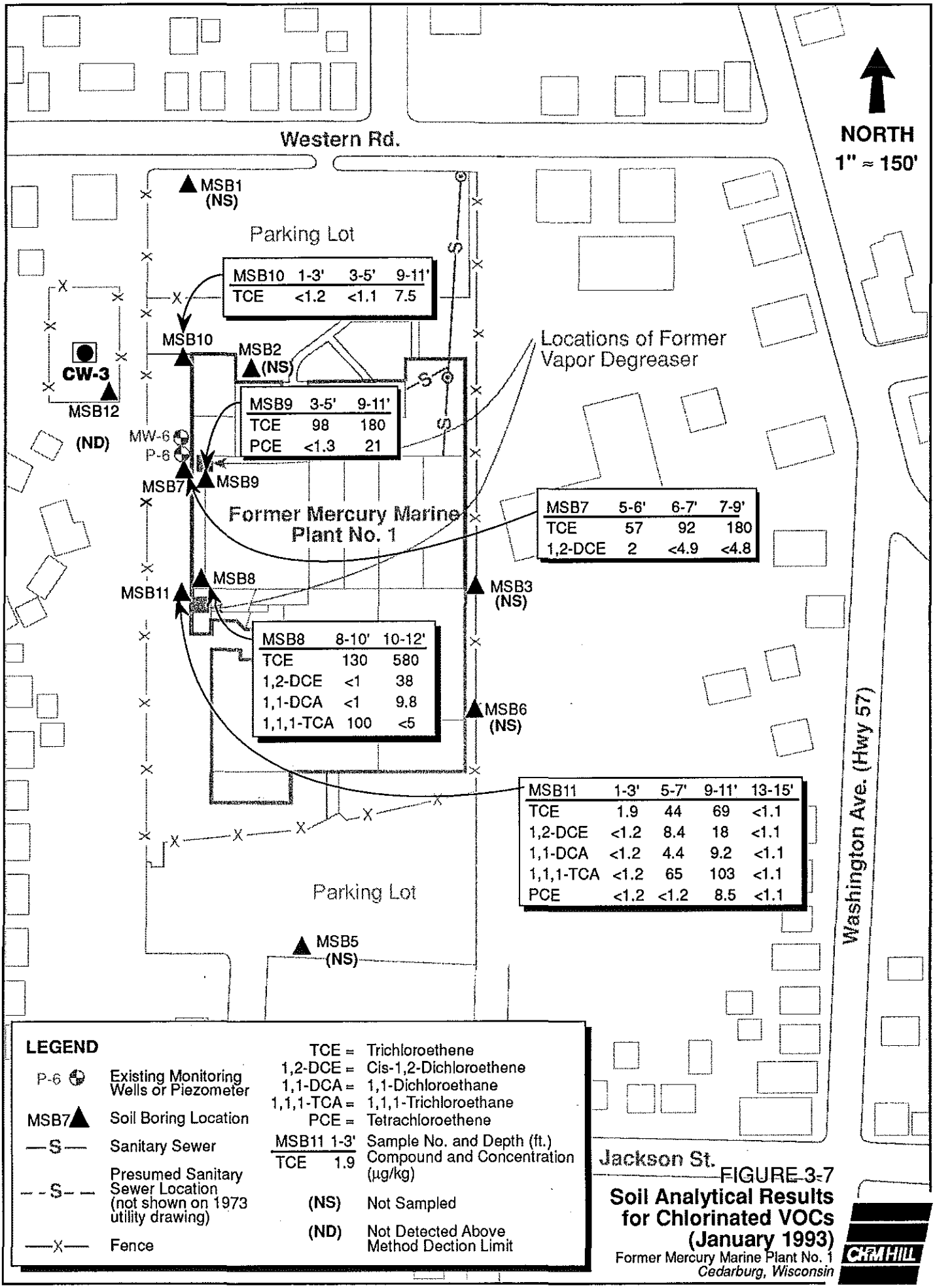


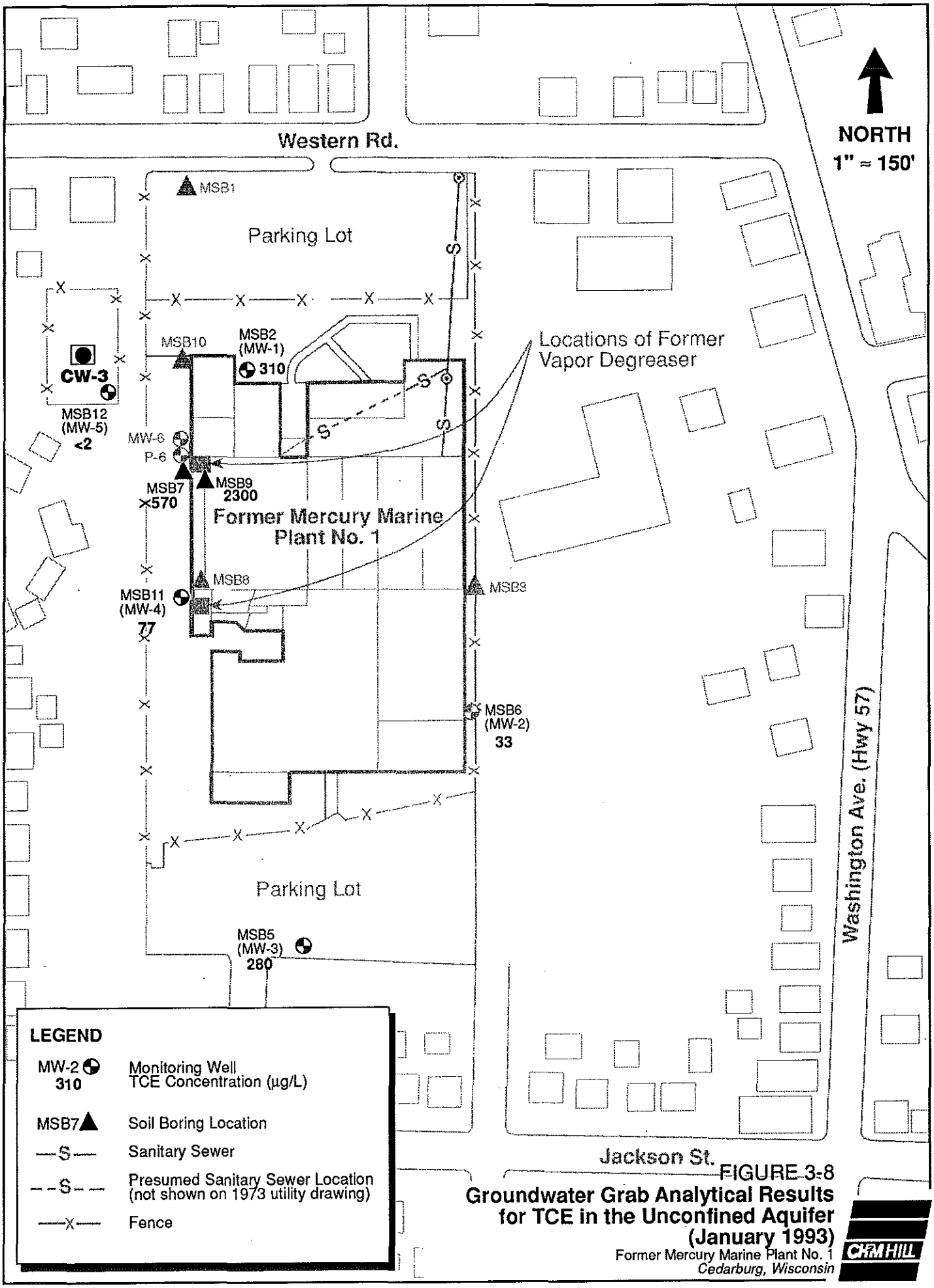
FIGURE 3-7

Soil Analytical Results for Chlorinated VOCs (January 1993)

Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

CH2M HILL

GLO33316.A0.00 Analytical Results 3-29-93 CS/vts



GLC033316.A0.00 Groundwater Concentrations 3-29-93 CS/vls

FIGURE 3-8

Groundwater Grab Analytical Results for TCE in the Unconfined Aquifer (January 1993)

Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

CH2M HILL

Table 3-2
Groundwater Analytical Results
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

Sample Location:	MSB02	MSB05	MSB05 Duplicate	MSB06	MSB07	MSB07	MSB07 Duplicate	MSB09	MSB10	MSB11	MSB11	MSB12		
Unit Sampled:	Till	Till	Till	Bedrock	Till	Bedrock	Bedrock	Till	Bedrock	Till	Bedrock	Till		
Depth Interval (ft):	11 to 15	41 to 44	41 to 44	20 to 60	12 to 15	18 to 28	18 to 28							
Sample Date:	1/13/93	1/15/93	1/15/93	1/20/93	1/22/93	1/22/93	1/22/93	1/21/93	1/25/93	1/25/93	1/25/93	1/27/93	PAL	ES
Volatiles, µg/L														
Chloroethane	< 10	< 10	< 20	< 2	< 50	< 50	< 50	< 200	< 2	**63**	**39**	< 2	--	--
1,1-Dichloroethane	< 5	**7.8**	< 10	< 1	< 25	< 25	< 25	< 100	< 1	**92**	**92**	< 1	85	850
cis-1,2-Dichloroethene	< 5	**100**	**62**	< 1	< 25	< 25	< 25	< 100	< 1	**110**	**12**	< 1	10	100
M-t-butyl-ether	< 5	**9.8**	< 10	< 1	< 25	< 25	< 25	< 100	< 1	< 10	< 5	< 1	--	--
1,1,1-Trichloroethane	**30**	< 5	< 10	**8.5**	< 25	< 25	< 25	< 100	< 1	**16**	**158**	< 1	40	200
Trichloroethene	**310**	**280**	**230**	**33**	**570**	**99**	**100**	**2300**	< 1	**77**	< 5	< 1	0.18	5
Vinyl Chloride	< 10	**11**	< 20	< 2	< 50	< 50	< 50	< 200	< 2	**130**	**90**	< 2	0.0015	0.2
Inorganics, mg/L														
Alkalinity	730	3400	4200	410	NA	3600	4800	2600	400	72000	600	480	--	--
Chemical Oxygen Demand	270	890	1100	23	NA	340	230	610	160	5600	58	22	--	--
Iron	84	2000	2400	28	NA	340	290	1700	77	2600	490	25	0.15	0.3
Hardness, Total	3800	240000	230000	1200	NA	44000	28000	34000	21000	340000	9800	3100	--	--
Total Organic Carbon	55	6300	4500	5.7	NA	330	26	480	46	2600	20	7.3	--	--

Bold type indicates compound detected above method detection limit.
PAL = Preventive Action Limit as established under Chapter NR 140 of the Wisconsin Administrative Code.
ES = Enforcement Standard as established under Chapter NR 140.

Grab Samples from Till

TCE was the VOC most frequently detected in the groundwater within the till and was detected at all locations sampled except MSB12 near City Well No. 3. Concentrations ranged from 77 μg/L at MSB11 (depth 12 to 15 feet) to 2,300 μg/L at MSB09 (depth 6 to 11 feet). TCE was also detected at MSB05 at the southern boundary of the site at a concentration of 210 μg/L (depth 41 to 44 feet). The results indicate that the highest concentrations of TCE are centered around the former locations of the vapor degreaser.

The presence of TCE at depth at location MSB05 is unexpected. MSB05 is located about 450 feet southeast of where the vapor degreaser was last located before it was removed. Current data are insufficient to support identification of source(s).

1,1-DCA, 1,2-DCE, and vinyl chloride were also detected in the grab samples at MSB05 and MSB11. Vinyl Chloride is another common degradation byproduct of TCE. Chloromethane and 1,1,1-TCA were detected at MSB11. 1,1,1-TCA was also detected at MSB02 at the north end of the main building. M-t-butyl-ether, a common gasoline additive, was detected at MSB05. No BTEX compounds, which typify gasoline or petroleum hydrocarbon products, were detected at this location making the presence of MTBE in this sample suspect.

Grab Samples From Bedrock

TCE was detected in the bedrock grab samples at MSB06 (20 to 60 feet) at a concentration of 33 μg/L and MSB07 (18 to 28 feet) at a concentration of 100 μg/L. 1,1,1-TCA was detected in the MSB06 bedrock grab sample at a concentration of 8.5 μg/L and in MSB11 (18 to 28 feet) at 158 μg/L. Chloromethane (39 μg/L), 1,1-DCA (92 μg/L), and vinyl chloride (90 μg/L) were also detected in the bedrock grab sample from MSB11.

TCE concentrations exceeded the Enforcement Standard (ES) of 5 μg/L as established under Chapter NR 140 of the Wisconsin Administrative Code. The ES for 1,2-DCE (100 μg/L) was also met or exceeded at MSB05 and MSB11. In addition, 1,1-DCA and 1,1,1-TCA concentrations at MSB11 exceeded the Preventative Action Limits (PALs) as established under NR 140. The PAL is generally 10 percent of the ES. The PALs and ESs for the detected compounds are listed in Table 3-2.

Relationship of City Wells No. 3 and No. 5

One of the objectives of the study was to determine the radius of influence of city water supply wells CW-3 and CW-5. The purpose of this exercise was to address DNR's allegation that releases from Plant No. 1 were the source of chlorinated VOCs observed in both of the city production wells. An additional objective was to determine whether

any of the other potential source areas identified in Strand's report could fall within the radius of influence of either well and represent sources of chlorinated VOCs in the City wells.

The level of effort for this portion of the study was limited to a search and interpretation of available records. No additional intrusive work was conducted. It was hoped that pump test information might exist that would provide an indication of the radius of influence of the wells. No such information was found as part of CH2M HILL's record search. While pumping rates and drawdown information for the pumping wells are available and permit estimates of specific yield to be calculated, without drawdown data from adjacent wells completed within the same aquifer zone, it is not possible to predict, with any level of confidence, the radius of influence of a pumping well. This is particularly true of the present situation where the Cedarburg wells are not only completed in fractured bedrock but also draw from two different aquifer systems (the Niagara Dolomite and the underlying sandstone aquifer).

However, one piece of information that was discovered during the investigation may provide some information on the radius of influence of the wells. As part of the effort to evaluate whether pumping CW-3 had an impact on the aquifers near Plant No. 1, CH2M HILL obtained the water level records for CW-3 during both static and dynamic (pumping) conditions. During the time CW-3 was shut down, it was noticed that fluctuations as much as 5 feet occurred in the "static" water level in CW-3. In an attempt to explain this phenomenon, pumping records and water levels were obtained for CW-5, which is located about 2,400 feet to the south-southwest of CW-3. Comparing the times when CW-5 was pumping to changes in CW-3 water levels seems to show a reasonable correlation as shown in Figure 3-9. It needs to be emphasized that the data are limited and that this information is preliminary. A more conclusive interpretation can be obtained through trying to correlate drawdowns on a larger data set.

Such a hydraulic connection, as seems to be in place between CW-3 and CW-5, can be explained by considering the interconnectedness of fracture zones in the bedrock matrix. A study performed by IT Corporation for the DNR in 1989 suggests that two major fracture sets traverse the Niagara Dolomite at orientations of North 40° East and North 40° West. It is possible that the capture zones from both of the pumping wells intercept these major fracture zones, thereby explaining the response to pumping CW-5 observed in CW-3.

What can be said based on these observations is that there appears to be hydraulic connection between CW-3 and CW-5 and that the mechanism of interconnection appears to be preferential flow along an aligned fracture. What cannot be stated is the overall radius of influence of the pumping wells. In a fractured environment groundwater flow will occur preferentially along a fracture zone but the magnitude of the flow perpendicular to this fracture may be orders of magnitude less. So, while there is evidence to suggest that the influence of CW-5 is at least 2,400 feet along a preferred fracture, no conclusions can be drawn regarding the radius of influence in other directions. To do so, it would be necessary to assume that the fractured bedrock aquifer

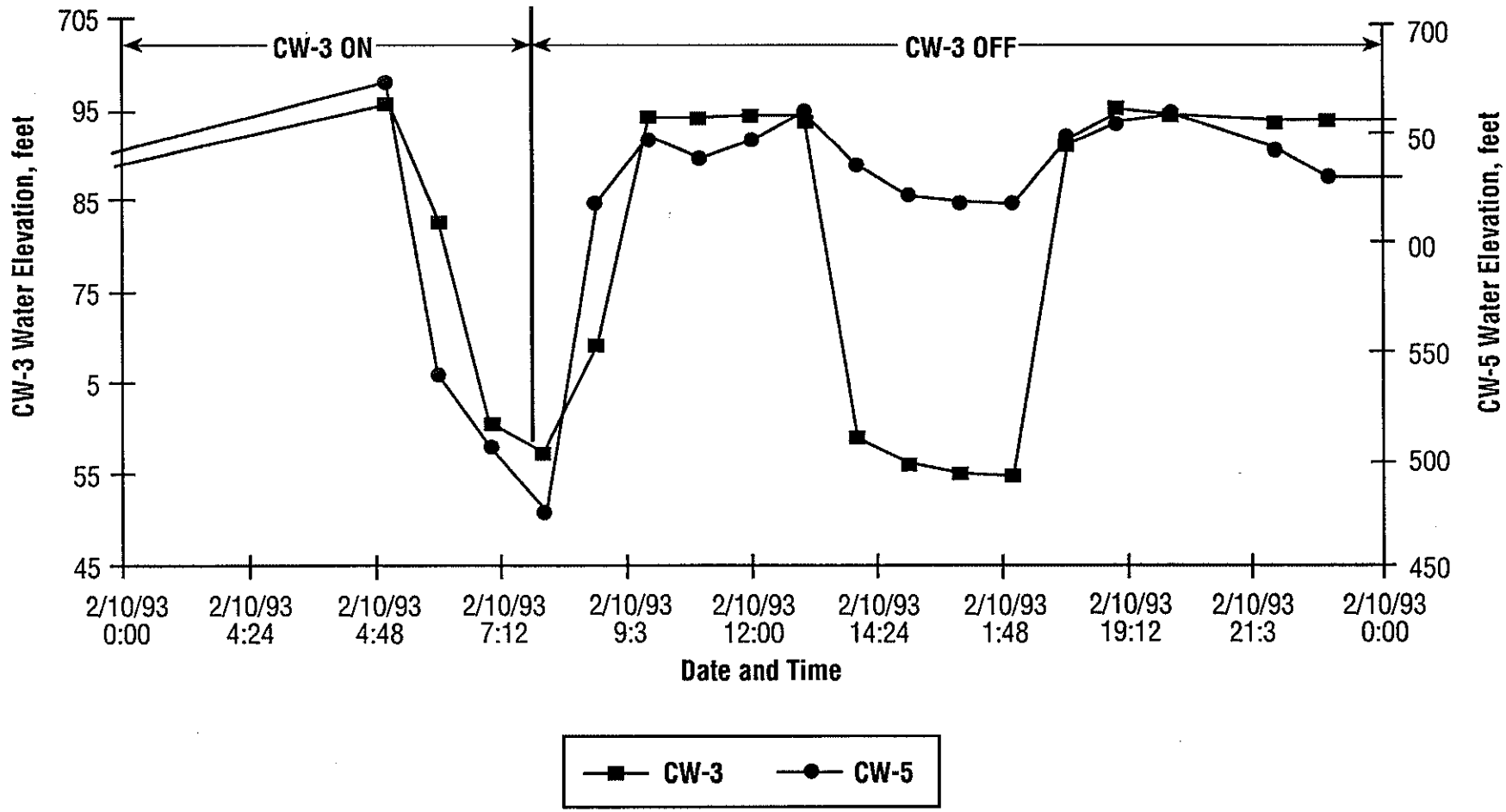


FIGURE 3-9
Water Level Relationship
CW-3/CW-5
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

G1033316.A0.00 Water Elevation Graph 4-1-93 cs

behaved as an equivalent porous medium (i.e., like sand). Such an assumption may be valid for the sandstone aquifer, but is probably not valid for the dolomite aquifer.

Summary and Conclusions

The results of the investigation conducted by CH2M HILL at the former Mercury Marine Plant No. 1 indicate the following:

- The site is underlain by glacial till that overlies weathered dolomite bedrock. The till is interbedded with silty to course sand lenses. Where saturated, the till and upper bedrock form a water table aquifer. Depth to groundwater ranges from less than 11 feet below grade at the northern end of the site to greater than 40 feet at the southern property boundary. The predominant direction of groundwater flow in this unit is to the south-southeast at a gradient of about 0.023 ft/ft.

- TCE, 1,1,1-TCA, and their degradation byproducts are present in the soils and shallow groundwater beneath and in the vicinity of former Plant No. 1.

- An unexpected occurrence of chlorinated VOCs was detected in the soils and groundwater in boring MSB05 at the southern property boundary at a depth of 44 feet below grade.

- Concentrations of TCE and several of the other chlorinated VOCs exceed the PALs and ESs established for these substances in NR 140 of the Wisconsin Administrative Code.

- Groundwater levels measured in site piezometers and monitoring wells during pumping and non-pumping conditions at city water supply well CW-3 were reviewed. Results show a response to pumping in piezometer P-6 (completed in the bedrock at a depth of 160 feet) but no response in any of the wells and piezometers completed in the upper bedrock and till units. These results suggest that lower portions of the bedrock and the upper bedrock/till aquifer at the local scale behave independently and are not hydraulically connected. From this observation it is difficult to support the allegation that the chlorinated VOCs present locally in the till/upper bedrock groundwater are the source of chlorinated VOCs observed in city well CW-3.

- Static water level measurements in CW-3 collected under non-pumping conditions appear to show a response to pumping in city well CW-5. This observation suggests a hydraulic connection between the two wells. Such a connection may be explained through the orientation and interconnectedness of regional bedrock fracture systems. These observations suggest that, at

least in a northeast-southwest direction, the radius of influence of city well CW-5 is as much as 2,400 feet from the pumping well.

This study did not develop information that would reveal other potential sources of the VOCs reported in CW-3 and CW-5. It is important to note that VOCs from elsewhere within the influence of either of these two wells could be causing or contributing to the contamination reported at these wells.

10011BCB.GLO

APPENDIX A
TECHNICAL MEMORANDUMS

PREPARED FOR: Mercury Marine

PREPARED BY: Laura Peterson/CH2M HILL

DATE: March 29, 1993

SUBJECT: Former Mercury Marine Plant No. 1 Site Investigation
Soil Boring, Well Installation, and Soil Sampling

PROJECT: GLO33316.A0.00

Introduction

This technical memorandum summarizes the soil boring, well installation, and soil sampling procedures used during the site investigation at the former Mercury Marine Plant No. 1 in Cedarburg, Wisconsin. Work commenced on January 13, 1993, and was completed on January 27, 1993.

Drilling services were provided by Layne-Northwest Co. of Pewaukee, Wisconsin. Analytical services were provided by Precision Analytical Laboratory (PAL) of Milwaukee, Wisconsin.

Personnel

The personnel onsite to perform the groundwater and soil sampling and to oversee the soil borings are listed below.

Team Member	Responsibilities
Laura Peterson	Project Hydrogeologist, Site Safety Coordinator
Aaron Petri	Sample Team Member, Surveying
Jeff Lamont	Sample Team Member, Logging Rock Cores
Dan Chatfield	Surveying

Soil Borings

Twelve borings were drilled to provide stratigraphic and hydrogeologic information as well as physical and chemical soil characteristics. The borings were advanced to bedrock using 4.25-inch hollow stem augers and were continuously sampled at 2-foot intervals

using 3-inch split spoon samplers. Soil samples were logged by the onsite CH2M HILL hydrogeologist. A USCS field classification was recorded for each soil type observed. Soil properties such as relative moisture content, color, density or consistency, soil structure, and mineralogy were also recorded. Copies of the soil boring logs are in Attachment 1. Cuttings were placed in U.S. DOT-approved 55-gallon drums. Each drum was marked with its borehole location and moved to a central location onsite pending disposal.

Soil samples were collected for chemical analyses from boring MSB8, MSB9, MSB10, MSB11, and MSB12 (see Figure 2-1). A 3-inch split-spoon sampler was driven at 2-foot intervals. Immediately after the spoon was opened, the soil sample was screened for VOCs using an HNu photoionization detector. At least one soil sample was collected from each stratigraphic unit present in the unconsolidated formation. Two 4-ounce VOA jars were filled first, followed by two 4-ounce jars for TOC analysis. The filled jars were placed on ice in a cooler pending delivery to the laboratory. Soil samples were submitted for VOC and TOC analyses based on field screening results or visual appearance. Samples not submitted for analyses were disposed of in a 55-gallon drum. Table TM1-1 lists the soil samples submitted for chemical analyses. VOC analyses was done using the U.S. EPA's SW-846 method SW-8241.

The stainless steel sampling trowel was decontaminated after each sample's collection using a TSP and water solution followed by a 10-percent methanol and water rinse and a final distilled water rinse. The rinsate was collected and stored in 55-gallon drums pending disposal.

For those boreholes not chemically sampled, HNu screenings were done on the split-spoon sample immediately following opening of the spoon. Readings were recorded on the soil boring logs.

The work plan stated that four soil samples would be collected from borings inside the building for physical characterization and that samples from the clay would be collected using Shelby tube samplers. Because of the stiff, often gravelly till encountered in the subsurface and the size of the electric rig used for drilling, it was not possible to push a Shelby tube to collect soil samples for physical analyses. However, a total of three Shelby tube samples were obtained from two borings (MSB7 and MSB11) just outside of the west side of the building. Soil samples were immediately sealed in the tubes using sealing wax provided by the drilling contractor. Physical samples were submitted to PAL for grain size, moisture content, and porosity analyses. The boring location and depth interval of the samples submitted are listed in Table TM1-1.

Table TM1-1
Soil Samples Collected for Physical and Chemical Analysis
Mercury Marine Plant No. 1
Cedarburg, Wisconsin

Boring No.	Depth, ft.	Soil	Date	Parameters
MSB07	3 to 5	Clayey Silt	1/22/93	Grain Size, Porosity, % Moisture
	5 to 6	Clay	1/22/93	VOC, TOC
	6 to 7	Clay	1/22/93	VOC, TOC
	7 to 9	Gravelly Sand	1/22/93	VOC, TOC
	9 to 11	Sandy Silt	1/22/93	Grain Size, Porosity, % Moisture
MSB08	8 to 10	Clay	1/20/93	VOC, TOC
	10 to 12	Clay	1/20/93	VOC, TOC
MSB09	3 to 5	Clay/Fine Sand	1/21/93	VOC, TOC
	9 to 11	Gravelly Sand	1/21/93	VOC, TOC
MSB10	1 to 3	Clayey Sand/Clay	1/22/93	VOC, TOC
	3 to 5	Clay	1/22/93	VOC, TOC
	9 to 11	Well-Graded Sand	1/22/93	VOC, TOC
MSB11	1 to 3	Clay/Silty Sand	1/25/93	VOC, TOC
	3 to 5	Sandy Silt	1/25/93	Grain Size, Porosity, % Moisture
	5 to 7	Silty Clay/Silty Sand	1/25/93	VOC, TOC
	9 to 11	Silty Clay	1/25/93	VOC, TOC
	13 to 15	Sandy Gravel	1/25/93	VOC, TOC

PREPARED FOR: Mercury Marine

PREPARED BY: Laura Peterson/CH2M HILL

DATE: March 29, 1993

SUBJECT: Former Mercury Marine Plant No. 1 Site Investigation
Soil Boring, Well Installation, and Soil Sampling

PROJECT: GLO33316.A0.00

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	6 to 7	Clay	1/22/93	VOC, TOC
	7 to 9	Gravelly Sand	1/22/93	VOC, TOC
	9 to 11	Sandy Silt	1/22/93	Grain Size, Porosity, % Moisture
MSB08	8 to 10	Clay	1/20/93	VOC, TOC
	10 to 12	Clay	1/20/93	VOC, TOC
MSB09	3 to 5	Clay/Fine Sand	1/21/93	VOC, TOC
	9 to 11	Gravelly Sand	1/21/93	VOC, TOC
MSB10	1 to 3	Clayey Sand/Clay	1/22/93	VOC, TOC
	3 to 5	Clay	1/22/93	VOC, TOC
	9 to 11	Well-Graded Sand	1/22/93	VOC, TOC
MSB11	1 to 3	Clay/Silty Sand	1/25/93	VOC, TOC
	3 to 5	Sandy Silt	1/25/93	Grain Size, Porosity, % Moisture
	5 to 7	Silty Clay/Silty Sand	1/25/93	VOC, TOC
	9 to 11	Silty Clay	1/25/93	VOC, TOC
	13 to 15	Sandy Gravel	1/25/93	VOC, TOC

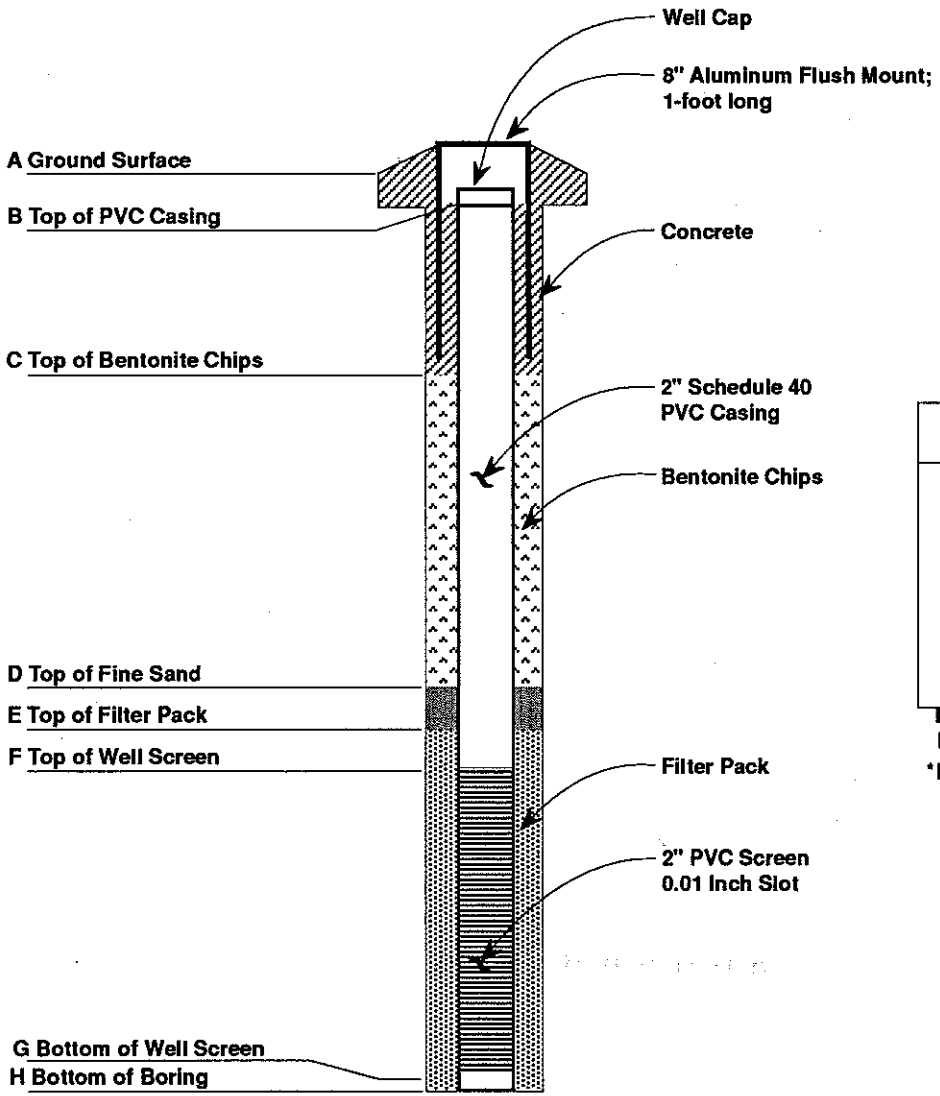
In 4 of the 12 borings, drilling continued 10 feet into competent bedrock using air rotary drilling methods. A 10-foot long rock core was obtained from the bedrock surface at borings MSB7, MSB10, and MSB11. At boring MSB6, rock cores were collected from 20 to 60 feet below grade. A 1.78-inch core barrel was used to obtain the cores. Each core was placed in a core box labeled with the site name, borehole location, sample interval, and date. The cores were logged by a CH2M HILL hydrogeologist. Copies of the rock core logs are included in Attachment 1.

For borings in which monitoring wells were not installed, the borehole was abandoned using either bentonite chips or bentonite-cement grout. Bentonite-cement grout was used abandon the borings inside the plant building.

Monitoring Well Installation

Five monitoring wells were installed to provide information about the groundwater flow direction in both the glacial till and bedrock. The wells were constructed with 2-inch Schedule 40 PVC riser and 0.010-inch factory-slotted screen. Wells MW-1, MW-3, and MW-5 were fitted with 5-foot screens and MW-4 with a 10-foot screen. The bedrock well, MW-2 was fitted with a 15-foot screen. The riser pipes and screens were steam cleaned before use. Following screen and riser installation, a medium-grained sand pack was placed in the annulus of the borehole to a height of about 2 feet above the top of the screen. A 2-foot layer of fine-grained silica sand was place above the filter pack. For the wells screened in the unconsolidated formation, bentonite chips were placed above the sand pack to a height of about 4 feet below the ground surface. For the bedrock well, a 5-foot layer of chips were placed above the fine sand. The remainder of the annulus was filled with bentonite slurry to about 4 feet below grade. The wells were completed with a concrete surface seal and 1-foot-long aluminum flush mounts. A locking, expanding well cap was placed on the riser pipes. The completed well was developed using a bailer to surge and purge the well.

Monitoring well construction details are shown in Figure TM1-1. Monitoring well construction and development forms were completed for each well and submitted to the Wisconsin DNR per Chapter NR 141 of the Wisconsin Administrative Code. Copies of those forms are in Attachment 2.



Monitoring Well	A	B	C	D	E	F	G	H
MW-1	787.37	787.02	783.37	781.37	779.37	777.37	772.37	772.37
MW-2*	786.52	786.27	750.52	745.52	743.52	741.52	726.52	726.52
MW-3	799.58	799.18	795.58	773.58	771.58	769.58	764.58	755.58
MW-4	786.06	785.84	783.56	783.06	782.06	781.06	771.06	758.06
MW-5	793.43	793.20	789.43	781.93	780.93	778.93	773.93	773.93

Elevations are in feet and are referenced to MSL.

*For MW-2, bentonite slurry was used to fill the annulus from 750.52 feet to 782.52 feet.

FIGURE TM1-1
Monitoring Well Construction Details
Former Mercury Marine Plant No. 1
Cedarburg, Wisconsin

CH2M HILL

GLO33316.A0.00 Const. Detail 2-22-93 lml

Health and Safety

Drilling, groundwater grab sampling, and soil sampling were performed in Level D personal health and safety protection. CH2M HILL personnel were responsible for ambient air monitoring during drilling and sampling activities and for enforcing the provisions outlined in CH2M HILL's Health and Safety Plan. Ambient air monitoring was conducted using either an HNu photoionizer or an OVA. There were no positive readings for ambient air throughout the field investigation. The HNu and OVA were calibrated at the start of each day.

Surveying

The soil borings and monitoring wells were located by CH2M HILL personnel. Horizontal locations were surveyed to the nearest 0.1 foot. Ground elevations for the borings and the top of well casings were surveyed to the nearest 0.01 foot. The horizontal and vertical locations for the borings and wells are listed in Table TM1-2.

Table TM1-2
Survey Results
Mercury Marine Plant No. 1
Cedarburg, Wisconsin

Boring No.	X-Coord.	Y-Coord.	Elevation
MSB01	2,535,313	477,928	785.42
MSB02	2,535,376	477,714	787.37
MSB03	2,535,671	477,464	786.42
MSB04	2,535,680	477,296	786.64
MSB05	2,535,484	477,005	799.58
MSB06	2,535,677	477,317	786.52
MSB07	2,535,312	477,586	787.28
MSB08	2,535,307	477,443	786.38
MSB09	2,535,300	477,587	786.49
MSB10	2,535,305	477,719	788.57
MSB11	2,535,318	477,433	786.06
MSB12	2,535,210	477,680	793.43

Note: X and Y coordinates are based on Wisconsin state plane coordinate system grid, South Zone

Elevations are in feet and are referenced to mean sea level, 1929 Adjustment

Documentation

Field measurements and descriptions made during the field work were recorded in the field log book (see Attachment 3).

Chain-of-custody forms (see Attachment 4) were kept from the point of sample origin to delivery to the laboratory. Specific laboratory chain-of-custody procedures as described in Section 5 of the Quality Assurance Project Plan were followed with the exception that the laboratory's own chain-of-custody form was used. In addition, the sample coolers were not locked and sealed because either the courier from the laboratory picked up the samples at the site, or the samples were delivered directly to the lab by a CH2M HILL team member.

PREPARED FOR: Mercury Marine

PREPARED BY: Laura Peterson/CH2M HILL

DATE: March 26, 1993

SUBJECT: Former Mercury Marine Plant No. 1 Site Investigation
Groundwater Grab Sampling

PROJECT: GLO33316.A0.00

Introduction

This technical memorandum summarizes the procedures and field measurements taken during groundwater grab sampling at the former Mercury Marine Plant No. 1 in Cedarburg, Wisconsin. Work commenced on January 13, 1993, and was completed on January 27, 1993. Analytical services were provided by Precision Analytical Laboratory (PAL) of Milwaukee, Wisconsin. Water level measurement activities are also documented in this memorandum.

Personnel

The personnel onsite to perform the groundwater sampling are listed below.

Team Member	Responsibilities
Laura Peterson	Project Hydrogeologist, Site Safety Coordinator
Aaron Petri	Sample Team Member
Jeff Lamont	Sample Team Member and Hydrogeologist

Field Work Activities

Soil Boring

Groundwater grab samples were collected from the glacial till at borings MSB2, MSB5, MSB7, MSB9, MSB11, and MSB12. Grab samples were also collected from the dolomite at borings MSB6, MSB7, MSB10, and MSB11. After a boring was advanced to the top of bedrock, the augers were pulled back about 3 feet and a PVC screen and riser were dropped down inside the augers to the bottom of the borehole. Where drilling

continued into the dolomite, the water sample was collected from within the borehole casing.

Water Level Measurement

Before sampling, water levels were measured with an electronic water level indicator to the nearest 0.01 foot from the northernmost point of the well riser. Water level measurements were also made from the monitoring wells during both the site investigation and the pump test. The measurements are listed in Table TM2-1.

Well Purging

After measuring the water level, the depth to the bottom of each borehole was sounded with the water level indicator to determine the total depth of the well. The volume of water in the casing was calculated using the equation

$$V_{gal} = 7.48\pi r^2 h$$

where:

h = height of the water column in feet
r = radius of the well in feet

A stainless steel bailer was used to purge at least three well volumes. Boreholes went dry after a limited amount of purging were allowed to recover before sampling began. Purge water was collected in 5-gallon buckets and emptied into 55-gallon drums at a central plant location pending disposal.

Sample Collection

After purging the well, water samples were collected with a stainless steel bailer. Samples for VOC analysis were collected first. The sample bottles were labeled with the sample designation and the date and time of collection. The filled bottles were placed in a cooler on ice pending shipment to the laboratory. Samples were submitted to PAL for analysis of VOCs, alkalinity, hardness, TOC, COD, and iron. The CH2M HILL hydrogeologist documented sample collection activities in the field log book, a copy of which is in Attachment 3.

Table TM2-1
Groundwater Elevations
Mercury Marine Plant No. 1
Cedarburg, Wisconsin

Well No.	X-Coord.	Y-Coord.	TOC Elevation	Groundwater Elevation									
				2/2/93	2/9/93	2/10/93	2/15/93	2/18/93	2/24/93	2/24/93	2/25/93	2/26/93	3/3/93
MW-1	5376.33	7713.70	787.02	776.84	776.81	776.78	776.72	776.76	776.56	776.59	--	--	776.50
MW-2	5677.22	7317.34	786.27	766.04	766.08	766.02	766.06	--	765.84	765.84	765.87	765.82	765.83
MW-3	5483.59	7004.67	799.18	766.72	766.78	766.95	--	--	--	--	--	--	766.75
MW-4	5317.50	7432.94	785.84	775.82	775.44	775.73	775.67	775.63	--	--	--	775.50	775.49
MW-5	5209.60	7679.82	793.20	777.43	777.39	777.95	--	--	777.13	777.28	777.26	777.12	777.07
MW-6	5307.01	7600.86	787.19	776.87	776.84	776.79	776.71	776.69	776.59	776.59	776.58	776.58	776.54
P-6	5307.87	7590.98	787.16	753.54	753.63	753.77	754.26	754.06	754.44	754.05	753.57	753.92	752.84

Note: Units are in feet.
Elevations referenced to mean sea level.
TOC = Top of Casing.
-- indicates water level not measured.

Decontamination Procedures

The bailers were decontaminated between sampling locations. Bailers were washed with a TSP and tap water mixture followed by a distilled water rinse, 10 percent methanol rinse, and a final distilled water rinse.

Chain of Custody

Chain-of-custody forms (Attachment 4) were kept from the point of sample origin to delivery to the laboratory. Specific laboratory chain-of-custody procedures as described in Section 5 of the Quality Assurance Project Plan were followed with the exception that the laboratory's own chain-of-custody form was used. In addition, the sample coolers were not locked and sealed because either the courier from the lab picked up the samples at the site, or the samples were delivered directly to the lab by a CH2M HILL team member.

ATTACHMENT 1
SOIL BORING AND ROCK CORE LOGS

CH2MHILL

PROJECT NUMBER	BORING NUMBER (MW-1)	
GL033316.A0.02	MSB2	SHEET 1 OF 1

SOIL BORING LOG

PROJECT Mercury Marine Plant No. 1 LOCATION In front of garage door "K"

ELEVATION _____ DRILLING CONTRACTOR Layne-NW

DRILLING METHOD AND EQUIPMENT Brat · 22R

WATER LEVELS _____ START 1/13/93 FINISH 1/13/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						OVA BG = 0ppm
1					Asphalt. Sandy Gravel Fill.	Begin drilling @ 1349
	1-3		1		Silty Clay (CL). DK brown - Black. moist stiff. Some Clay. 2'6"	OVA = BG
3					Silty Sand (SM). Lt. Brown. Moist. Med. Dense. Some black clay.	
	3-5		1		Same (SM). Dense. Trace fine gravel. Some orange mottling. Trace rock fragments	OVA = BG
5						
	5-7		2		Same (SM). Some black clay. Somewhat more clayey than above. Some gravel. Some larger gravel (2-in ϕ) in bottom 8".	OVA = BG
7						
	7-9		2		Clayey SILT (CL-ML). Brown. Moist. Very dense. Some fine sand. Some rounded gravel.	OVA = BG
9						
	9-11		0.8		Same as above (CL-ML).	OVA = BG OVA breathing zone = BG t = 1435
11						
	11-13		0.9		Silty, well-graded SAND (SW). Brown. Wet. Med. dense. Some gravel. ▽	OVA = BG
13						
	13-15		1.4		Clayey, well-graded SAND ( ). Brown. Wet. Some silt and gravel. Dense. Some gravel angular. 14'4" Silty CLAY (ML-CL). Lt gray. Moist. Hard. Some sand and gravel.	OVA = BG Hit rock @ 15.5'
15						

EOB @ 15.5'

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
GL033316.A0.00	MSB3	1	1

SOIL BORING LOG

PROJECT Mercury Marine Plant No 1 LOCATION East of bldg near Door # 4

ELEVATION _____ DRILLING CONTRACTOR Layne - NW

DRILLING METHOD AND EQUIPMENT Brat-22R, 4.25" HSA, 3" split-spoon

WATER LEVELS _____ START 1/14/93 FINISH 1/14/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG = 0.25 ppm
					Asphalt. Sand & Gravel Fill. (GW)	Begin boring @ 0931.
1	1-3		1.5		Sandy gravel (GW). Black & brown. Moist. Some silt. Trace asphalt. Trace clay. 2'	HNu = BG. HNu breathing zone = BG
					Poorly-graded fine silty Sand (SP-SM) Brown. slightly moist Med. dense.	
3	3-5		1.8		Same (SP). Grading to a silt with some clay. 3'6" Clayey SILT (ML). Brown. Moist Dense Trace fine sand. Trace orange mottling	HNu deflected slightly above BG.
5	5-7		1		Clayey silt (ML-CL). Somewhat more Clayey than above Brown. Moist. Dense. Some fine sand Trace gravel. Rock fragments 4" from tip.	HNu = BG
7	7-9		1.5		Same (ML-CL). More moist than above Some fine sand seams.	HNu = BG
9	9-11		1.8		Poorly-graded, fine, silty Sand (SM-SP) 8'10" Brown. Moist Loose. Clayey SILT (ML-CL) Brown. Moist. Dense. Trace gravel. Fine sand seams Rock fragment about 1' from tip 3 inch sand lense at tip. Clayey silt in spoon tip. 10'6"	HNu = BG. Hit bedrock @ 10.5' No water.
11					EOB @ 10.5' t = 1040	

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PROJECT NUMBER	BORING NUMBER (MW-2) MSB4 & MSB6	SHEET 1	OF 1
GLO 33316.A0.00			

SOIL BORING LOG

PROJECT Mercury Marine Plant No. 1 LOCATION East of bldg. near dock

ELEVATION _____ DRILLING CONTRACTOR Layne-NW

DRILLING METHOD AND EQUIPMENT Brat-22R, 4.25" HSA, 3" split-spoon

WATER LEVELS _____ START 1/14/93 FINISH 1/14/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG = 0.25 ppm
	Blind Drilled				Silty sand and gravel fill. Fine roots in upper 2 inches.	Start drilling @ 1150
1	1-3		1.3		Clayey SILT (CL-ML). Brown. slightly moist. Very dense. Trace gravel. Some fine sand. Much orange mottling	HNu = BG
3	3-5		1.5		SILT (ML). Brown. Slightly Moist. Very dense. Some fine sand. Trace Clay and gravel. Some fine sand seams. Much rust mottling.	HNu = BG
5	5-7		0.3		Clayey Silt (ML-CL). Brown. Moist. Dense. Some fine sand. Trace gravel. Fine rock fragments in tip.	Couldn't drive spoon past 6½'. Hit rock. Rock fragments in cuttings from 5-7 ft.
7	7-9		0		Some clayey silt in tip of spoon. Rock fragments in tip	
9	9-11		1		Silty, very fine, poorly-graded sand (SM-SP). Brown Moist Loose. Trace rock fragments. 9'4" Clayey SILT (CL-ML). Brown. Moist Very dense, some sand seams. Trace orange mottling. Bottom 3" sandier.	HNu = BG
11	11-13		0.3		Clayey Sand (SC). Brown. Very Moist. Med. dense. Some gravel. Sand is coarser than above.	HNu = BG
13	13-15		0.7		Clayey Silt (CL-ML). Brown. Very Moist Dense. Clayier than above. Trace gravel. Some fine sand seams	HNu = BG
15						

CH2MHILL

PROJECT NUMBER	BORING NUMBER		
GL033316.A2.DP	MSB5 (MW-3)	SHEET 1	OF 3

SOIL BORING LOG

PROJECT Mercury Marine Plant No. 1 LOCATION South Parking lot

ELEVATION _____ DRILLING CONTRACTOR Layne-NW

DRILLING METHOD AND EQUIPMENT Brat. 22R; 4.25" HSA; 3" split spoon

WATER LEVELS _____ START 1/14/93 FINISH 1/15/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG: 0.25 ppm
0					Asphalt Silty, sandy, clayey gravel Fill.	Start drilling @ 1500
1	1-3		1.3		Clayey SILT (CL-ML). Brown. Moist. Hard. Some fine sand.	HNu = BG
3	3-5		1.1		Same (CL-ML). Lower 6" softer Trace gravel.	HNu = BG
5	5-7		1.2		Same (CL-ML). Trace orange mottling. Bottom 8" is a lighter brown than above. Trace small gravel.	HNu = BG
7	7-9		1.4		Clayey Silt. (CL-ML). Brown. Slightly moist Very dense. Some fine sand. Trace gravel. Some orange mottling.	HNu = BG
9	9-11		1.5		Same (CL-ML). Not as clayey as above. One fine sand seam fracture.	HNu = BG
11	11-13		2		Same (CL-ML). Some 1½" gravel. Some orange mottling. Dense.	HNu = BG
13	13-15		2		Same (CL-ML). Very dense. Rock fragment 1' from bottom.	HNu = BG
15						

CH2MHILL

PROJECT NUMBER	BORING NUMBER MSB5 SHEET 2 OF 3

SOIL BORING LOG

PROJECT _____ LOCATION South Parking Lot

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVELS _____ START 1/14/93 FINISH 1/15/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION — SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS — DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	15-17		0		Rock and clayey silt in tip	
17	17-19		0.8		Same (CL-ML). Some rock fragments.	HNu = BG
19	19-21		1.8		Same (CL-ML). Dense. Some gravel and rocks.	HNu = BG
21	21-23		2		Same (CL-ML) Silty clay (CL). Gray. Moist. 22' Stiff. Trace gravel.	Stop drilling @ 1655
23	23-25		0.3		Silty Clay (CL). Brown. Wet. Soft. Trace gravel. Some fine sand.	Begin drilling @ 0720 on 1/15 HNu BG = 0.3 ppm
25	25-27		0.3		Same (CL). Wet. 2" fine-medium Clayey sand lense in tip.	
27	27-29		1.5		Same (CL). Clayey sand and rock fragments in tip	HNu = BG
29	29-31		0.7		Same (CL). 4" sandy gravel in tip. Brown. Dry Loose.	HNu: BG

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PROJECT NUMBER	BORING NUMBER MSB5 SHEET 3 OF 3

SOIL BORING LOG

PROJECT _____ LOCATION South Parking Lot

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVELS _____ START 1/14/93 FINISH 1/15/93 LOGGER L Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
31						
	31-33		1.1		Same ( ). Two inches of orange mottling about 6" from tip (right above fine sand). 32'6"	HNu = BG
33					Fine, poorly-graded Sand (SP). Brown. moist. loose, Some silt	
	33-35		1.1		Same (SM-SP). wet. Trace small rounded gravel.	HNu deflected slightly ½ ppm.
35					Clayey sand (SC). Wet. Some gravel	
	35-37		1.2		36' Silty Clay (CL). Gray-brown. Moist. Hard. Trace sand and gravel. Some rock fragments.	HNu = BG
37						
	37-39		0.7		Same (CL). Rock 6" from tip.	HNu = BG
39					No Recovery.	Spoon probably pushing rock.
	39-41		0			
41					No Recovery.	Rock in tip. cuttings are the silty clay.
	41-43		0			
43					Silty clay (CL). Same as above. Weathered bedrock in bottom inch. sandy rock fragments. Lt. brown.	
	43-45		0.3		EOB @ 44'	EOB @ 1015 Am
45						

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
G-033316.A0.00	MSB7	1	2

SOIL BORING LOG

PROJECT Mercury Marine Plant No. 1 LOCATION West of bldg.

ELEVATION _____ DRILLING CONTRACTOR Layne-NW

DRILLING METHOD AND EQUIPMENT Brat. 22R, 4.25" HSA, 3" split-spoon

WATER LEVELS _____ START 1/22/93 FINISH 1/22/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG = 0.4 ppm
					Asphalt. Concrete 1'	start boring @ 0808
1					Gravelly sand (SW). Black & Brown. Moist. Loose. Black cinders throughout. 1'6"	HNu = BG
	1-3		1.8		Clay (CL). Brown & Lt-gray. Moist Medium. Some silt. Trace fine gravel. much orange mottling.	
3						
	3-5				Pushed Shelby Tube.	Some silty clay in tip of Shelby Tube.
5						(Oily odor from 5-6')
	5-7		2		Clay (CL). Lt. Gray. Moist. Soft. Some black discoloration. Trace orange mottling. 6'	HNu deflected slightly (0.1 ppm)
					Silty Clay (CL). Brown & Lt-gray. Moist. Medium. Trace fine gravel. More gravelly in lower 4 inches.	Two fractures in lower foot (Some fine-med. grained sand in fractures. Slight discoloration greenish black)
7					Well-graded gravelly sand (SW). Orangish-brown. Moist. Loose	HNu = BG
	7-9		1			
9						
	9-11				Pushed Shelby Tube	
11						
	11-13		0.5		Same (SW). Lower 4" wet	HNu = BG ▽ Getting into weathered rock.
13						
	13-15		0.8		Silty Clay (CL). Gray. Moist. Very stiff. much gravel, large dolomite fragments.	In weathered bedrock. Tough drilling.
15						

CH2MHILL

PROJECT NUMBER	BORING NUMBER		
GLO 33316.A0.00	MSB7	SHEET 2	OF 2

SOIL BORING LOG

PROJECT Mercury Marine Plant No 1 LOCATION west side of bldg

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVELS _____ START 1/22/93 FINISH 1/22/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	15-16		0.3		Sandy, silty clay (CL). Gray. Wet. Soft. Much gravel. 2-inch rock 16'	Met refusal @ 16'
					EOB	Will collect 10' rock core. Reamed down thru weathered bedrock to 18'. Will try to core from 18-28'.

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PROJECT NUMBER	BORING NUMBER		
GL033316.AØ.ØØ	MSB8	SHEET 1	OF 1

SOIL BORING LOG

PROJECT Mercury Marine Plant No. 1 LOCATION Inside bldg @ south end

ELEVATION _____ DRILLING CONTRACTOR Layne-NW

DRILLING METHOD AND EQUIPMENT Simpco Electric Rig, 4.25" HSA, 3" split-spoon

WATER LEVELS _____ START 1/20/93 FINISH 1/20/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG = 0.35 ppm
1					Concrete Gravel Concrete	Abandoned pit
2					Sand + gravel fill 2'3"	
3	2-4		1		very fine silty sand (SP-SM). Brown. Moist. med. dense Large rock 8" from tip.	HNu = BG Collect soil sample 2-4'
4						
5	4-6		0.8		Silty Clay (CL). Brown. Moist. Stiff. some fine sand. Trace gravel. Some rust mottling.	HNu = BG Collect soil sample 4-6'
6						
7	6-8		2		Silty Clay (CL). Brown. Moist. Stiff. Some sand. much gravel. Trace rust mottling. About 1 ft from tip some sand discolored - greenish black	HNu = BG
8						
9	8-10		1.3		Same (CL). Some greenish-black sand about 8" from tip where there was a fracture. Some rock fragments in lower 6".	HNu of sand fracture = 3ppm Collect soil sample 8-10'
10						Driller says it feels like we're getting into weathered bedrock
11	10-12		1.8		Silty Clay (CL). Gray-brown. Slightly moist. Very stiff Some Sand. Trace fine gravel. Two fractures in lower foot.	HNu = 2.6 ppm Collected soil sample from 10-12'
12						
	12-13		1		Clay (CL). Dk. gray. Slightly moist Hard Some silt. Trace sand and fine gravel. Trace hairline fractures. 13'3"	HNu = 2 ppm Met resistance @ 13'3". Weathered bedrock in spoon tip
					EOB	
14						

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
GLO 333116.AØ ØØ	MSB9	1	1

SOIL BORING LOG

PROJECT Mercury Marine Plant No. 1 LOCATION Inside Bldg - NW Corner

ELEVATION _____ DRILLING CONTRACTOR Layne - NW

DRILLING METHOD AND EQUIPMENT Simco Electric Rig, 4.25" HSA, 3" split-spoon

WATER LEVELS _____ START 1/21/93 FINISH 1/21/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG = 0.35 ppm
	(Blind drilled)				Concrete upper 7". Then 5" of sandy, silty clay.	Start boring @ 1200
1						
	1-3		1.8		Silty, gravelly sand (SM-SW). Brown. Slightly moist Dense. Lower foot more silty. Trace rust mottling.	Slight deflect of needle on HNu (0.1 ppm)
						Encountering much resistance while augering from 1-3 feet
						Collected sample from 1-3'
3						
	3-5		1.7		Silty clay (CL). Lt. brown. Moist. Medium, much sand. Trace small gravel. 4'	Collected sample from 3-5'
						HNu = 0.3 ppm
					Silty, fine sand (SM-SP). Brown. Moist Loose. Trace clay. 4'8"	Slight discoloration of sand Some sand greenish black
5					Silty clay (CL). Lt. brown. Moist. med. stiff. Trace fine gravel.	
	5-7		0		No Recovery.	Hitting a lot of rocks.
7						
					Gravelly sand (SW). Brown. Dry. 7'11"	Collected sample from 7-9'
	7-9		1.2		Dolomite Rock. Lt. Gray 8'4"	HNu = 0.4 ppm
					Gravelly sand (SW). Brown. Dry. Loose. Some orange coloring.	Weathered bedrock in spoon tip
9						
	9-11		1.2		Same (SW). Very moist. Some 2" subangular gravel. One dolomite rock fragment at top. Some discolored sand (greenish-black)	HNu = 6 ppm
						Collected sample from 9-11'
						HNu of cuttings = 4 ppm
11					11'6"	
					EOB	Resistance due to bedrock
13						

CH2MHILL

PROJECT NUMBER	BORING NUMBER		
GL033316.A0.00	MSB10	SHEET 1	OF 1

SOIL BORING LOG

PROJECT Mercury Marine Plant No 1 LOCATION Outside Bldg - NW Corner

ELEVATION _____ DRILLING CONTRACTOR Layne - NW

DRILLING METHOD AND EQUIPMENT Brat 22R, 4.25" HSA 3-inch split-spoon

WATER LEVELS _____ START 1/22/93 FINISH 1/22/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG = 0.3 ppm
					Asphalt. Concrete. Sand & Gravel fill.	
1	1-3		2		Clayey sand & Gravel (GC). 1'4" Blackish brown. Moist. Very stiff. Bits of coal. Some thin wires.	At about 1 ft depth, some copper wires in cuttings HNu = BG Sample collected from 1-3'
3	3-5		2		Silty Clay (CL). Brown & Lt. gray. Moist Stiff. Some bits of coal. A few thin wires. Same (CL). Some black discoloration in upper foot & 3" silty sand lense (med-coarse) about 4" from tip. Some greenish-black discoloration of sand.	Collected sample from 3.5' HNu = BG
5	5-7		1.7		Same (CL.) 2-inch rocks 1' from tip. Drier than above. Trace coarse sand. Trace stones. Trace orange mottling.	HNu = BG.
7	7-9		2		Same (CL). Trace gravel. 8'6"	HNu = BG
9	9-11		1		Well-graded sand & gravel (SW). Orangish-brown. Moist. Loose. Rock fragments in spoon tip. Same (SW). Three dk. rust horizontal bands	HNu = BG Collected sample from 9-11'
11					Pushed Shelby Tube.	Only recovered about 4". Tip of tube bent up. Wet, sand & gravel (SW) in tip. ▽
13	13-13.5		0		13.5' EOB	Hitting pretty competent bedrock at about 13.5 ft. Stop drilling @ 1610 Will rock core on Monday

CH2M HILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
GLO 33316.AØ ØØ	MSB11 (MW-4)	1	1

SOIL BORING LOG

PROJECT Mercury Marine Plant No. 1 LOCATION SW Corner of bldg

ELEVATION _____ DRILLING CONTRACTOR Layne-NW

DRILLING METHOD AND EQUIPMENT Brat-22R, 4.25" HSA, 3-inch split-spoon

WATER LEVELS _____ START 1/25/93 FINISH 1/25/93 LOGGER L Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG = 0.3 ppm
					Asphalt - 6" Concrete - 6"	Start drilling @ 1352
1			1.5		Sandy silty clay (CL). Brown-Black. Moist. Stiff. Much black ashes. Some gravel. 1'6"	HNu = BG
					Very fine silty sand (SM-SP). Brown. Moist. Trace black cinders. Some gravel much gravel in tip.	Collected sample + dupe from 1-3'
3					Pushed Shelby Tube	Silt and med-grained sand in tip.
5			1		Silty Clay. Lt. Brown. Moist. Medium. 5'6"	Collected sample from 5-7'
					Silty, med. grained sand (SM-SP). Brown. Wet. Loose. Some greenish-black discoloration.	
7			1.6		Silty Clay (CL-ML). Lt. brown. Moist. Medium. Some gravel and rock fragments. 8'6"	HNu = BG
					Med-grained sand (SP). Brown. Wet. Loose. Trace gravel. Rocks in Lower 3".	Some green discoloration of sand
9			2		Silty Clay (CL). Upper foot very moist with much sand. Same sand green. Lower foot drier and siltier. Two horizontal fractures. Some gravel throughout.	HNu = BG
						Collected sample + MS-MSD from 9-11'
11					Pushed shelby tube	Tried pushing shelby Tube from 11-13'. No recovery. Just rock in tip.
13					Rock. Lt-tan. Very Weathered. 13'4"	
			1.1		Sandy gravel (GW). Gray. Wet. Loose. Rock fragments. Some sand is green.	HNu = BG
						Collected sample from 13-15'
15					15' EOB	Resistance @ 15' t=1510

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
GL033316.A0.00	MSB12 (MW-5)	1	2

SOIL BORING LOG

PROJECT Mercury Marine Plant No. 1 LOCATION Near City Well No. 3 (inside fence)

ELEVATION _____ DRILLING CONTRACTOR Layne - NW

DRILLING METHOD AND EQUIPMENT Brat. 22R, 4.25" HSA, 3-inch spl.t spoon

WATER LEVELS _____ START 1/26/93 FINISH 1/26/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE: INTERVAL	SAMPLE: NUMBER AND TYPE	SAMPLE: RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
						HNu BG = 0.25 ppm
		Blind Drilled			Topsoil	Start drilling @ 1333
1	1-3		1.5		Clayey SILT (ML). DK. brown. Moist. very dense. Much fine sand. Some fine roots in upper 8". Lower 6" has some gravel. Some horizontal fractures.	HNu = BG
3	3-5		2		Silty Clay (CL). DK brown - Black. Moist. Stiff. 3'6" Silty Clay (CL). Lt. brown. slightly moist. Very stiff. Some gravel. Trace coarse sand. Trace orange mottling. Trace Lt. gray mottling.	HNu = BG About 8" from tip, some coarser black sand (green-black?) along side of sample.
5	5-7		1.5		Same (CL). A couple of 2" rocks in lower foot.	HNu = BG
7	7-9		1.7		Same (CL). >18" Silt (ML). Lt. Brown. Moist. Dense. 2" Coarse sand seam with 8'4" gravel at lower end - very moist Silty Clay (CL). Lt. brown. Moist.	HNu = BG 2" rock about 1.1 ft. from tip
9	9-11		1.7		Stiff Much gravel. Some coarse sand. Same (CL). slightly moist Hard. Rock in tip Much orange mottling. Some black speckles.	HNu = BG.
11	11-13		0.2		Clay (CL). Lt. Brown. Very Moist. Medium. Some silt Much gravel.	
13	13-15		2		Same (CL). Grades into a gray Clay. 13'6" Clay (CL). Gray. Dry. Hard. Some silt A couple of hairline horizontal fractures.	HNu: BG
15						

PROJECT NUMBER	BORING NUMBER MSB12 SHEET 2 OF 2

SOIL BORING LOG

PROJECT _____ LOCATION Near city well No. 3 (inside fenc

ELEVATION _____ DRILLING CONTRACTOR _____

DRILLING METHOD AND EQUIPMENT _____

WATER LEVELS _____ START 1/26/93 FINISH 1/26/93 LOGGER L-Peterson

DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL	SAMPLE NUMBER AND TYPE	SAMPLE RECOVERY (FT)	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS AND INSTRUMENTATION
	15-17		1.5		Same (CL). Some horizontal hairline fractures. Somewhat siltier than above.	
17	17-19		1		Same (CL). 17'3" Clay (CL). Gray. Moist. Very stiff. Some silt and sand. Much gravel. Some weathered rock fragments - (yellowish tan in color)	HNu = BG A well-graded sand seam about 8" from tip - WET
19	19-19.5		0.3		Sandy Clay (CL). Gray. Wet. 19.5' Medium. Some gravel. Dolomite rocks in tip. EOB @ 19.5'	HNu = BG Met resistance @ 19.5' Stop drilling @ 14:55

CH2M HILL

PROJECT NUMBER	BORING NUMBER (mw-2)	SHEET	OF
GLO 33316.A0.00	MSB6	1	3

ROCK CORE LOG

PROJECT Mercury Marine Plant No. 1 LOCATION East side of bldg.

ELEVATION _____ DRILLING CONTRACTOR Layne - NW

DRILLING METHOD AND EQUIPMENT Brat - 22R, Air Rotary ORIENTATION _____

WATER LEVEL AND DATE _____ START 1/19/93 FINISH 1/20/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES: RQD (%)	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS)	GRAPHIC LOG	LITHOLOGY (ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS)	COMMENTS (SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.)
16						Unconsolidated, Gravel (up to 3" ø) Gray clay. Fine silty sands.	
17							
18							
19							
20							
21	10'/10' = 100%	61		RQD = Fair. Fracturing - Vertical (0°) Jointing - 80° Some vugs - filled with calcite. Small solution cavities (up to ½" ø) Some secondary jointing at 90°. Jointing is moderately close (1 - 3 ft).		Dolomite. Lt. gray to Lt. tan. Fine-grained. Hard. Slightly weathered. Massive bedding.	
22							
23							
24							
25							
26							
27							
28							
29							
30							

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET
GLN 33316.A0.00	MSB6	2 OF 3

ROCK CORE LOG

PROJECT Mercury Marine Plant No. 1 LOCATION

ELEVATION DRILLING CONTRACTOR

DRILLING METHOD AND EQUIPMENT ORIENTATION

WATER LEVEL AND DATE START 1/19/93 FINISH 1/20/93 LOGGER

DEPTH BELOW SURFACE (FT)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES: RQD (%)	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS)	GRAPHIC LOG	LITHOLOGY (ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS)	COMMENTS (SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.)
31	10'/10'	80		RQD = Good Fracturing at 0° & 45°. One large solution cavity (1.5") @ 35' filled with calcite. Not as much FeOx staining, fracturing, jointing, or vugs as above.		Dolomite - Lt. gray. Fine-grained. Hard. Massive bedding.	
32							
33							
34							
35							
36							
37							
38							
39							
40							
41	10'/10'	82		RQD = Good. Fractures nearly vertical. Little Fe Ox staining. Few vugs. Little to no solution cavities. Some Secondary jointing @ 90°. Joint spacing moderately Close.		Dolomite. Lt. gray. fine-grained. Hard. Slightly weathered. Massive bedding.	
42							
43							
44							
45							

CRMHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
GLO 33316.A0.00	MSB6	3	3

ROCK CORE LOG

PROJECT Mercury Marine Plant No. 1 LOCATION

ELEVATION DRILLING CONTRACTOR

DRILLING METHOD AND EQUIPMENT ORIENTATION

WATER LEVEL AND DATE START 1/19/93 FINISH 1/20/93 LOGGER

DEPTH BELOW SURFACE (FT)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES: RQD (%)	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS)	GRAPHIC LOG	LITHOLOGY (ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS)	COMMENTS (SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.)
46							
47							
48							
49							
50							
51	10/10'	91		RQD = Excellent. No solution Cavities increase (up to 1"ϕ) Fracturing - 0°, 40°, 90°. Highly vesicular, more fractured than above. Joint spacing - close. much Fe Ox staining.		Dolomite. Lt-gray. Fine-grained Hard. Moderate weathering. Massive bedding.	
52							
53							
54							
55							
56							
57							
58							
59							
60							

EOB @ 60'

CH2MHILL

PROJECT NUMBER	BORING NUMBER	
GLO 33316.AØ.ØØ	MSB7	SHEET 1 OF 1

ROCK CORE LOG

PROJECT Mercury Marine Plant No. 1 LOCATION West side of bldg.

ELEVATION _____ DRILLING CONTRACTOR Layne-NW

DRILLING METHOD AND EQUIPMENT Brat-22R, Air Rotary ORIENTATION _____

WATER LEVEL AND DATE _____ START 1/22/93 FINISH 1/22/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES: RQD (%)	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION — DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS	GRAPHIC LOG	LITHOLOGY — ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS	COMMENTS — SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.
19	10/10' = 100%	50		RQD = Poor. Some solution cavities Fractures - 20°, 35°, Some secondary jointing @ 90°. Very little Fe Ox staining		Dolomite. Lt-gray. slightly weathered/fresh. Fine-grained. Hard. Bedding Massive	
20							
21							
22							
23							
24							
25							
26							
27							
28							

REV 7/86 FORM D2113A

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET
GLO33316.A0.00	MSB10	1 OF 1

ROCK CORE LOG

PROJECT Mercury Marine Plant No. 1 LOCATION NW Corner of bldg.

ELEVATION _____ DRILLING CONTRACTOR Layne - NW

DRILLING METHOD AND EQUIPMENT Brat - 22R, Air Rotary ORIENTATION _____

WATER LEVEL AND DATE _____ START 1/25/93 FINISH 1/25/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES: RQD (%)	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS)	GRAPHIC LOG	LITHOLOGY (ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS)	COMMENTS (SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.)
14.5	10/10 = 100%	52		RQD = Fair Jointing - Moderately Close Fractures - 0° & 90° Some solution cavities. Somewhat vesicular. Some Fe Ox staining.		Dolomite. Lt-gray Fine-grained Slightly Weathered. Hard. Bedding - Massive.	
15.5							
16.5							
17.5							
18.5							
19.5							
20.5							
21.5							
22.5							
23.5							

CH2MHILL

PROJECT NUMBER	BORING NUMBER	SHEET	OF
GL033316.A0.00	MSB11 (MW-4)	1	1

ROCK CORE LOG

PROJECT Mercury Marine Plant No. 1 LOCATION SW Corner of bldg.

ELEVATION _____ DRILLING CONTRACTOR Layne - NW

DRILLING METHOD AND EQUIPMENT Brat - 22R, Air Rotary ORIENTATION _____

WATER LEVEL AND DATE _____ START 1/26/93 FINISH 1/26/93 LOGGER L. Peterson

DEPTH BELOW SURFACE (FT)	CORE RUN, LENGTH, AND RECOVERY (%)	DISCONTINUITIES: RQD (%)	DISCONTINUITIES: FRACTURES PER FOOT	DISCONTINUITIES: DESCRIPTION (DEPTH, TYPE, ORIENTATION, ROUGHNESS, PLANARITY, INFILLING MATERIAL AND THICKNESS, SURFACE STAINING, AND TIGHTNESS)	GRAPHIC LOG	LITHOLOGY (ROCK TYPE, COLOR, MINERALOGY, TEXTURE, WEATHERING, HARDNESS, AND ROCK MASS CHARACTERISTICS)	COMMENTS (SIZE AND DEPTH OF CASING, FLUID LOSS, CORING RATE AND SMOOTHNESS, CAVING ROD DROPS, TEST RESULTS, ETC.)
19	10/10' = 100%	57		RQD = Fair Fracturing - 0°, 90° A few vugs. Some FeOx staining.		Dolomite. Lt. gray. Fine grained Hard. Slightly weathered. Bedding - Massive.	
20							
21							
22							
23							
24							
25							
26							
27							
28							

ATTACHMENT 2
MONITORING WELL CONSTRUCTION DEVELOPMENT FORMS

Facility/Project Name: Mercury Marine

Facility License, Permit or Monitoring Number: _____

Grid Location: 477,714 ft. ☒ N. ☐ S. / 2,535,376 ft. ☒ E. ☐ W.

Well Name: MW-1

Wis. Unique Well Number: _____ DNR Well Number: _____

Type of Well: ~~Water Table~~ Observation Well ☒ 11 / Piezometer ☐ 12

Section Location: NW 1/4 of SE 1/4 of Section 34, T 10 N, R 21 ☒ E ☐ W

Date Well Installed: 01/13/93 (m m / d d / y y)

Distance Well Is From Waste/Source Boundary: unknown ft.

Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☒ Not Known

Well Installed By: (Person's Name and Firm) Vince Meindel, Layne - Northwest

Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No

A. Protective pipe, top elevation 787.37 ft. MSL

B. Well casing, top elevation 782.02 ft. MSL

C. Land surface elevation 787.4 ft. MSL

D. Surface seal, bottom _____ ft. MSL or 4.0 ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☒ SW ☐ SP
☐ SM ☒ SC ☐ ML ☐ MH ☒ CL ☐ CH
☐ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ _____

15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

16. Drilling additives used? ☐ Yes ☐ No

Describe _____

17. Source of water (attach analysis): _____

E. Bentonite seal, top _____ ft. MSL or NA ft.

F. Fine sand, top _____ ft. MSL or 6.0 ft.

G. Filter pack, top _____ ft. MSL or 8.0 ft.

H. Well screen, top _____ ft. MSL or 10.0 ft.

I. Well screen, bottom _____ ft. MSL or 15.0 ft.

J. Filter pack, bottom _____ ft. MSL or 15.0 ft.

K. Borehole, bottom _____ ft. MSL or 15.0 ft.

L. Borehole, diameter 6.0 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.05 in.

1. Cap and lock? ☒ Yes ☐ No

2. ~~Protective cover pipe~~: Flush Mount
a. Inside diameter: 8.0 in.
b. Length: 1.0 ft.
c. Material: Steel ☒ 04 / Other ☐ _____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30 / Concrete ☒ 01 / Other ☐ _____

4. Material between well casing and protective pipe: Bentonite ☐ 30 / Annular space seal ☒ / Other ☐ _____

5. Annular space seal: Chipped ~~Granular~~ Bentonite ☒ 33
_____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
_____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
_____ % Bentonite .... Bentonite-cement grout ☐ 50
0.33 ft^3 volume added for any of the above
How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08

6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
None Other ☒ _____

7. Fine sand material: Manufacturer, product name and mesh size
U.S. Silica; Fine sand; 0.2 - 0.3
Volume added 0.33 ft^3

8. Filter pack material: Manufacturer, product name and mesh size
American Materials; 0.35 - 0.45
Volume added 1.16 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ _____

10. Screen material: same
Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ _____
Manufacturer Monoflex
Slot size: 0.010 in.
Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☒ / Other ☐ _____

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

Signature: Laura Peterson Firm: CH2M Hill

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Mercury Marine
Well Name: MW-1
License, Permit or Monitoring Number:
Wis. Unique Well Number:
DNR Well Number:

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☒	4 1
surged with bailer and pumped	☐	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well: 30 min.
4. Depth of well (from top of well casisng): 14.5 ft.
5. Inside diameter of well: 2.05 in.
6. Volume of water in filter pack and well casing: 2.1 gal.
7. Volume of water removed from well: 30.0 gal.
8. Volume of water added (if any): 0. gal.
9. Source of water added: _____
10. Analysis performed on water added? ☐ Yes ☐ No (If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	10.05 ft.	10.10 ft.
Date	01/26/93 (m m d d y y)	01/26/93 (m m d d y y)
Time	7:30 ☒ a.m. ☐ p.m.	4:37 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	1.5 inches	0.5 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: Mike Santas
Firm: Layne-Northwest

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

Signature: Dan Peters
Firm: Cham Hill

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

Form 4400-113A 8-89

Facility/Project Name: Mercury Marine	Grid Location: 477,317 ft. ☒ N. ☐ S. / 2,535,677 ft. ☒ E. ☐ W.	Well Name: MW-2
Facility License, Permit or Monitoring Number: _____		Wis. Unique Well Number: _____ DNR Well Number: _____
Type of Well: ~~Water Table~~ Observation Well ☒ 11 / Piezometer ☐ 12	Section Location: NW 1/4 of SE 1/4 of Section 34, T 10 N, R 21 ☒ E ☐ W	Date Well Installed: 01/21/93 (m m / d d / y y)
Distance Well Is From Waste/Source Boundary: unKnown ft.	Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☒ Not Known	Well Installed By: (Person's Name and Firm): Vince Meindel / Layne-Northwest
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

A. Protective pipe, top elevation 786.52 ft. MSL
B. Well casing, top elevation 786.27 ft. MSL
C. Land surface elevation 786.4 ft. MSL
D. Surface seal, bottom _____ ft. MSL or 4.0 ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP
☐ SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH
☒ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☒ 50; Hollow Stem Auger ☒ 41; Other ☐ _____

15. Drilling fluid used: Water ☒ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☐ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe _____

17. Source of water (attach analysis):
Water tap inside building (west side)

E. Bentonite seal, top _____ ft. MSL or 38.5 ft.
F. Fine sand, top _____ ft. MSL or 41.0 ft.
G. Filter pack, top _____ ft. MSL or 43.0 ft.
H. Well screen, top _____ ft. MSL or 45.0 ft.
I. Well screen, bottom _____ ft. MSL or 60.0 ft.
J. Filter pack, bottom _____ ft. MSL or 60.0 ft.
K. Borehole, bottom _____ ft. MSL or 60.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.05 in.

1. Cap and lock? ☒ Yes ☐ No
2. ~~Protective cover pipe~~: Flush Mount
a. Inside diameter: 8.0 in.
b. Length: 1.0 ft.
c. Material: Steel ☒ 04; Other ☐ _____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ _____

4. Material between well casing and protective pipe: Bentonite ☒ 30; Annular space seal ☐; Other ☐ _____

5. Annular space seal: Granular Bentonite ☐ 33
_____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
9.4 Lbs/gal mud weight ..... Bentonite slurry ☒ 31
_____ % Bentonite .... Bentonite-cement grout ☐ 50
5.71 Ft³ volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☒ 02; Gravity ☐ 08

6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
Bentonite Chips (¢ 3/8") Other ☒

7. Fine sand material: Manufacturer, product name and mesh size
U.S. Silica; 0.2-0.3
Volume added 0.33 ft³

8. Filter pack material: Manufacturer, product name and mesh size
American Materials; 0.35-0.45
Volume added 2.81 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ _____

10. Screen material: Same
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ _____
Manufacturer Monoflex
Slot size: 0.010 in.
Slotted length: 15.0 ft.

11. Backfill material (below filter pack): None ☒; Other ☐ _____

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

Signature: Dawn Peterson Firm: CH2M HILL

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Mercury Marine
Well Name: MW-2
License, Permit or Monitoring Number:
Wis. Unique Well Number:
DNR Well Number:

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐	41
surged with bailer and pumped	☒	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well: 45 min.

4. Depth of well (from top of well casisng): 59.8 ft.

5. Inside diameter of well: 2.05 in.

6. Volume of water in filter pack and well casing: 12.7 gal.

7. Volume of water removed from well: 115.0 gal.

8. Volume of water added (if any): 0. gal.

9. Source of water added: _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	19.87 ft.	20.60 ft.
Date	01/26/93 (m m d d y y)	01/26/93 (m m d d y y)
Time	7:44 ☒ a.m. ☐ p.m.	12:15 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	1.0 inches	0.2 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe) Lt. brown	Clear ☐ 20 Turbid ☒ 25 (Describe) Lt. brown

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

Additional comments on development:

Borehole gained water during drilling of the last 10-15 feet. Driller blew out 70 gal. water following completion of drilling and prior to development.

Well developed by: Person's Name and Firm

Name: Gene

Firm: Layne - Northwest

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

Signature: Gene Peterson

Firm: Cham Hill

NOTE: Shaded areas are for DNR use only. See instructions for more information.

e of Wisconsin
arument of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

icility/Project Name: Mercury Marine	Grid Location: 477,005 ft. ☒ N. ☐ S. / 2,535,484 ft. ☒ E. ☐ W.	Well Name: MW-3
ility License, Permit or Monitoring Number:		Wis. Unique Well Number / DNR Well Number
ype of Well: ~~Water Table~~ Observation Well ☒ 11; Piezometer ☐ 12	Section Location: NW 1/4 of SE 1/4 of Section 34, T 10 N, R 21 ☒ E ☐ W	Date Well Installed: 01/15/93 (m m d d y y)
ance Well Is From Waste/Source Boundary: unknown ft.	Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☒ Not Known	Well Installed By: (Person's Name and Firm): Vince Meindel, Layne-Northwest
Vell A Point of Enforcement Std. Application? ☐ Yes ☒ No		

. Protective pipe, top elevation 799.58 ft. MSL
Well casing, top elevation 799.18 ft. MSL
. Land surface elevation 799.5 ft. MSL
Surface seal, bottom ____ ft. MSL or 4.0 ft.

USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☒ SP
☒ SM ☒ SC ☐ ML ☐ MH ☒ CL ☐ CH
☐ Bedrock

3. Sieve analysis attached? ☐ Yes ☒ No

Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐
_____

Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

. Drilling additives used? ☐ Yes ☒ No

Describe _____

7. Source of water (attach analysis):
_____

Bentonite seal, top ____ ft. MSL or NA ft.
. Fine sand, top ____ ft. MSL or 26.0 ft.
Filter pack, top ____ ft. MSL or 28.0 ft.
Well screen, top ____ ft. MSL or 30.0 ft.
. Well screen, bottom ____ ft. MSL or 35.0 ft.
Filter pack, bottom ____ ft. MSL or 35.0 ft.
. Borehole, bottom ____ ft. MSL or 44.0 ft.
Borehole, diameter 6.0 in.
O.D. well casing 2.38 in.
. I.D. well casing 2.05 in.

1. Cap and lock? ☒ Yes ☐ No
2. ~~Protective cover pipe~~: Flush Mount
a. Inside diameter: 8.0 in.
b. Length: 1.0 ft.
c. Material: Steel ☒ 04; Other ☐ _____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ _____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☒; Other ☐ _____

5. Annular space seal: Chipped ~~Granular~~ Bentonite ☒ 33
_____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
_____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
_____ % Bentonite .... Bentonite-cement grout ☐ 50
3.64 Ft³ volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08

6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
None Other ☒

7. Fine sand material: Manufacturer, product name and mesh size
U.S. Silica; 0.2-0.3
Volume added 0.33 ft³

8. Filter pack material: Manufacturer, product name and mesh size
American Materials; 0.35-0.45
Volume added 1.16 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ _____

10. Screen material: same
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ _____
Manufacturer MonoFlex
Slot size: 0.010 in.
Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☐
Bentonite Chips Other ☒

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

ignature: Dawn Peterson Firm: Cham Hill

ease complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Mercury Marine
Well Name: MW-3
License, Permit or Monitoring Number: _____
Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☒	41
surged with bailer and pumped	☐	61
surged with block and bailed	☐	42
surged with block and pumped	☐	62
surged with block, bailed and pumped	☐	70
compressed air	☐	20
bailed only	☐	10
pumped only	☐	51
pumped slowly	☐	50
Other _____	☐	

3. Time spent developing well: 55 min.

4. Depth of well (from top of well casisng): 34.6 ft.

5. Inside diameter of well: 2.05 in.

6. Volume of water in filter pack and well casing: 1.3 gal.

7. Volume of water removed from well: 2.0 gal.

8. Volume of water added (if any): 0.5 gal.

9. Source of water added: store bought distilled water

10. Analysis performed on water added? ☐ Yes ☒ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	31.80 ft.	Purged dry ft.
Date	01/27/93 (m m d d y y)	01/27/93 (m m d d y y)
Time	9:26 ☒ a.m. ☐ p.m.	10:38 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	1.2 inches	1.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: Mike Santas

Firm: Layne-Northwest

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

Signature: Lou Peterson

Firm: CH2M Hill

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

Form 4400-113A 8-89

Facility/Project Name: Mercury Marine
Facility License, Permit or Monitoring Number: _____

Grid Location: 477,433 ft. ☒ N. ☐ S.; 2,535,317 ft. ☒ E. ☐ W.

Well Name: MW-4
Wis. Unique Well Number: DNR Well Number:

Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12

Section Location: NW 1/4 of SE 1/4 of Section 34, T 10 N, R 21 ☒ E ☐ W

Date Well Installed: 01/26/93 (m m / d d / y y)

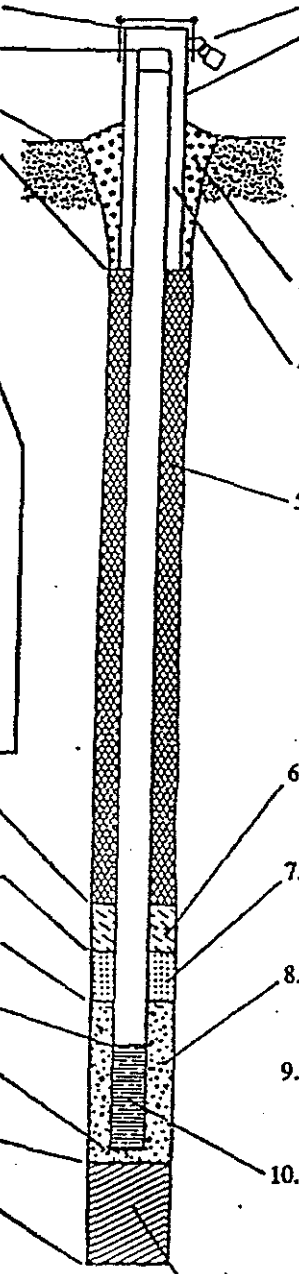
Distance Well Is From Waste/Source Boundary: unknown ft.

Well Installed By: (Person's Name and Firm)
Vince Meindel
Layne-Northwest

Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No

Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☒ Not Known

A. Protective pipe, top elevation 786.06 ft. MSL
B. Well casing, top elevation 785.84 ft. MSL
C. Land surface elevation 785.9 ft MSL
D. Surface seal, bottom _____ ft. MSL or 2.0 ft.



1. Cap and lock? ☒ Yes ☐ No
2. ~~Protective cover pipe:~~ Flush Mount
   a. Inside diameter: 8.0 in.
   b. Length: 1.0 ft.
   c. Material: Steel ☒ 04; Other ☐
   d. Additional protection? ☐ Yes ☒ No
   If yes, describe: _____
3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐
4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☒; Other ☐
5. Annular space seal: Chipped ~~Granular~~ Bentonite ☒ 33
   _____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
   _____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
   _____ % Bentonite .... Bentonite-cement grout ☐ 50
   0.17 Ft³ volume added for any of the above
   How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08
6. Bentonite seal: Bentonite granules ☐ 33; ☐1/4 in. ☐3/8 in. ☐1/2 in. Bentonite pellets ☐ 32
   None Other ☒
7. Fine sand material: Manufacturer, product name and mesh size
   U.S. Silica; 0.2-0.3
   Volume added 0.17 ft³
8. Filter pack material: Manufacturer, product name and mesh size
   American Materials; 0.35-0.45
   Volume added 1.82 ft³
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐
10. Screen material: same
    Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐
    Manufacturer Monoflex
    Slot size: 0.010 in.
    Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None ☒; Other ☐

12. USCS classification of soil near screen:
    ☐ GP ☐ GM ☐ GC ☒ GW ☐ SW ☒ SP
    ☒ SM ☐ SC ☐ ML ☐ MH ☒ CL ☐ CH
    ☐ Bedrock
13. Sieve analysis attached? ☐ Yes ☒ No
14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐
    _____
15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99
16. Drilling additives used? ☐ Yes ☒ No
    Describe _____
17. Source of water (attach analysis):
    _____

E. Bentonite seal, top _____ ft. MSL or NA ft.
F. Fine sand, top _____ ft. MSL or 3.0 ft.
G. Filter pack, top _____ ft. MSL or 4.0 ft.
H. Well screen, top _____ ft. MSL or 5.0 ft.
I. Well screen, bottom _____ ft. MSL or 15.0 ft.
J. Filter pack, bottom _____ ft. MSL or 15.0 ft.
K. Borehole, bottom _____ ft. MSL or 15.0 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.05 in.

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

Signature: Tom Peterson
Firm: Cram Hill

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with s. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT
Form 4400-113B 8-89

Facility/Project Name: Mercury Marine
Well Name: MW-4
License, Permit or Monitoring Number:
Wis. Unique Well Number:
DNR Well Number:

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☒	4 1
surged with bailer and pumped	☐	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well: 80 min.

4. Depth of well (from top of well casisng): 14.6 ft.

5. Inside diameter of well: 2.05 in.

6. Volume of water in filter pack and well casing: 3.3 gal.

7. Volume of water removed from well: 20.0 gal.

8. Volume of water added (if any): 0. gal.

9. Source of water added: _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	7.73 ft.	10.36 ft.
Date	01/27/93 (m m d d y y)	01/27/93 (m m d d y y)
Time	7:50 ☒ a.m. ☐ p.m.	9:29 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	2.0 inches	1.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: Mike Santas

Firm: Layne-Northwest

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

Signature: Dawn Peterson

Firm: CH2M Hill

NOTE: Shaded areas are for DNR use only. See instructions for more information.

State of Wisconsin
Department of Natural Resources

MONITORING WELL CONSTRUCTION
Form 4400-113A 8-89

Facility/Project Name	Grid Location	Well Name
Mercury Marine	477,680 ft. ☒ N. ☐ S.	MW-5
Facility License, Permit or Monitoring Number	2,535,210 ft. ☒ E. ☐ W.	Wis. Unique Well Number / DNR Well Number
Type of Well ~~Water Table~~ Observation Well ☒ 11 Piezometer ☐ 12	Section Location NW 1/4 of SE 1/4 of Section 34, T 10 N, R 21 ☒ E ☐ W	Date Well Installed 01/27/93 (m m / d d / y y)
Distance Well Is From Waste/Source Boundary: unKnown ft.	Location of Well Relative to Waste/Source: ☐ Upgradient ☐ Sidegradient ☐ Downgradient ☒ Not Known	Well Installed By: (Person's Name and Firm) Vince Meindel, Layne-Northwest
Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No		

A. Protective pipe, top elevation 793.43 ft. MSL
B. Well casing, top elevation 793.20 ft. MSL
C. Land surface elevation 793.2 ft. MSL
D. Surface seal, bottom _____ ft. MSL or 4.0 ft.

12. USCS classification of soil near screen:
☐ GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP
☐ SM ☐ SC ☐ ML ☐ MH ☒ CL ☐ CH
☐ Bedrock

13. Sieve analysis attached? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ____

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis):

E. Bentonite seal, top _____ ft. MSL or NA ft.
F. Fine sand, top _____ ft. MSL or 11.5 ft.
G. Filter pack, top _____ ft. MSL or 12.5 ft.
H. Well screen, top _____ ft. MSL or 14.5 ft.
I. Well screen, bottom _____ ft. MSL or 19.5 ft.
J. Filter pack, bottom _____ ft. MSL or 19.5 ft.
K. Borehole, bottom _____ ft. MSL or 19.5 ft.
L. Borehole, diameter 6.0 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.05 in.

1. Cap and lock? ☒ Yes ☐ No
2. ~~Protective cover pipe~~: Flush Mount
a. Inside diameter: 8.0 in.
b. Length: 1.0 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☐ 30; Annular space seal ☒; Other ☐ ____

5. Annular space seal: Chipped ~~Granular~~ Bentonite ☒ 33
____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
____ % Bentonite .... Bentonite-cement grout ☐ 50
1.24 Ft^3 volume added for any of the above
How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08

6. Bentonite seal: Bentonite granules ☐ 33
☐ 1/4 in. ☐ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
None Other ☒ ____

7. Fine sand material: Manufacturer, product name and mesh size
U.S. Silica; 0.2-0.3
Volume added 0.17 ft^3

8. Filter pack material: Manufacturer, product name and mesh size
American Materials; 0.35-0.45
Volume added 1.16 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ____

10. Screen material: Same
Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
Manufacturer Monoflex
Slot size: 0.010 in.
Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☒; Other ☐ ____

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

Signature: Laura Peterson Firm: CHam Hill

Please complete and return both sides of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B 8-89

Facility/Project Name: Mercury Marine

Well Name: MW-5

License, Permit or Monitoring Number: _____

Wis. Unique Well Number: _____ DNR Well Number: _____

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☒	4 1
surged with bailer and pumped	☐	6 1
surged with block and bailed	☐	4 2
surged with block and pumped	☐	6 2
surged with block, bailed and pumped	☐	7 0
compressed air	☐	2 0
bailed only	☐	1 0
pumped only	☐	5 1
pumped slowly	☐	5 0
Other _____	☐	

3. Time spent developing well: 30 min.

4. Depth of well (from top of well casisng): 19.2 ft.

5. Inside diameter of well: 2.05 in.

6. Volume of water in filter pack and well casing: 1.7 gal.

7. Volume of water removed from well: 20.0 gal.

8. Volume of water added (if any): 0. gal.

9. Source of water added: _____

10. Analysis performed on water added? ☐ Yes ☐ No
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	15.67 ft.	15.42 ft.
Date	01/27/93 (m m d d y y)	01/27/93 (m m d d y y)
Time	11:05 ☒ a.m. ☐ p.m.	11:45 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	2.1 inches	1.0 inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____.__ mg/l	_____.__ mg/l
15. COD	_____.__ mg/l	_____.__ mg/l

Additional comments on development:

Well developed by: Person's Name and Firm

Name: Mike Santas

Firm: Layne - Northwest

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

Signature: Laura Peterson

Firm: CH2M Hill

NOTE: Shaded areas are for DNR use only. See instructions for more information.

ATTACHMENT 3
FIELD NOTES

1/13/93

1040- Drillers setting up @ MSB1.
1054- Begin driving @ MSB1.
1158- Augers meeting a lot of resistance at MSB2 at depth of 5-7 ft. Cuttings look like weathered bedrock. Will try driving spoon from 7 to 9 ft.

1214 - Couldn't drive spoon more a few inches. Hit bedrock. Will break for lunch. No water in hole. May want to abandon hole.

1300- Back on site. Drillers will move over to ~~MSB1~~ MSB2. If we encounter water at ~~MSB1~~ MSB2, will abandon MSB1. If not will drill MSB1 deeper into bedrock until water encountered? Or perhaps move location of MSB1?

Drillers preparing to move over P-2 to MSB2.

1330- Drillers unloading supplies from truck.

1349- Begin boring @ MSB2.

1510- Complete augering @ MSB2.
W.T. @ 11 ft.
Bedrock @ 15.5 ft.

Drillers decanning 4-ft. well point

1536- 1.2 ft. water in auger
5 well V = 3.8 gal.

1540- Begin purging MSB2.
Purged dry 3 times.
Purged total of 1.5 gal.

1550- Sample MSB2.
Sample No: MGW11.

1/13/93

Field Parameters - MGW1

T(°C)	Cond(µmhos)	pH
10.5	900	7.0

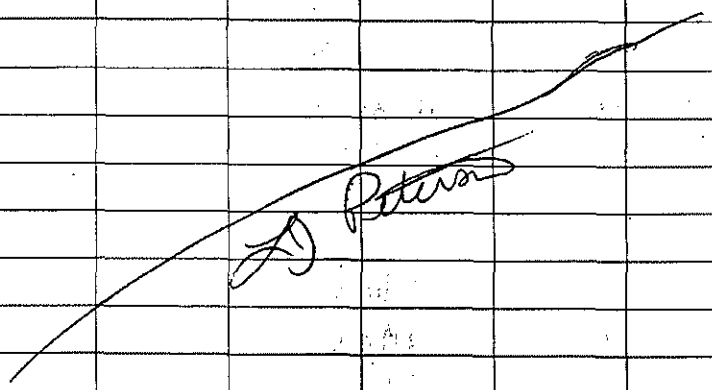
1600 - Drillers pulling augers @ MSB2.

1615 - Installing 5 ft. screen and PVC riser at MSB2. Will call well MW-1.

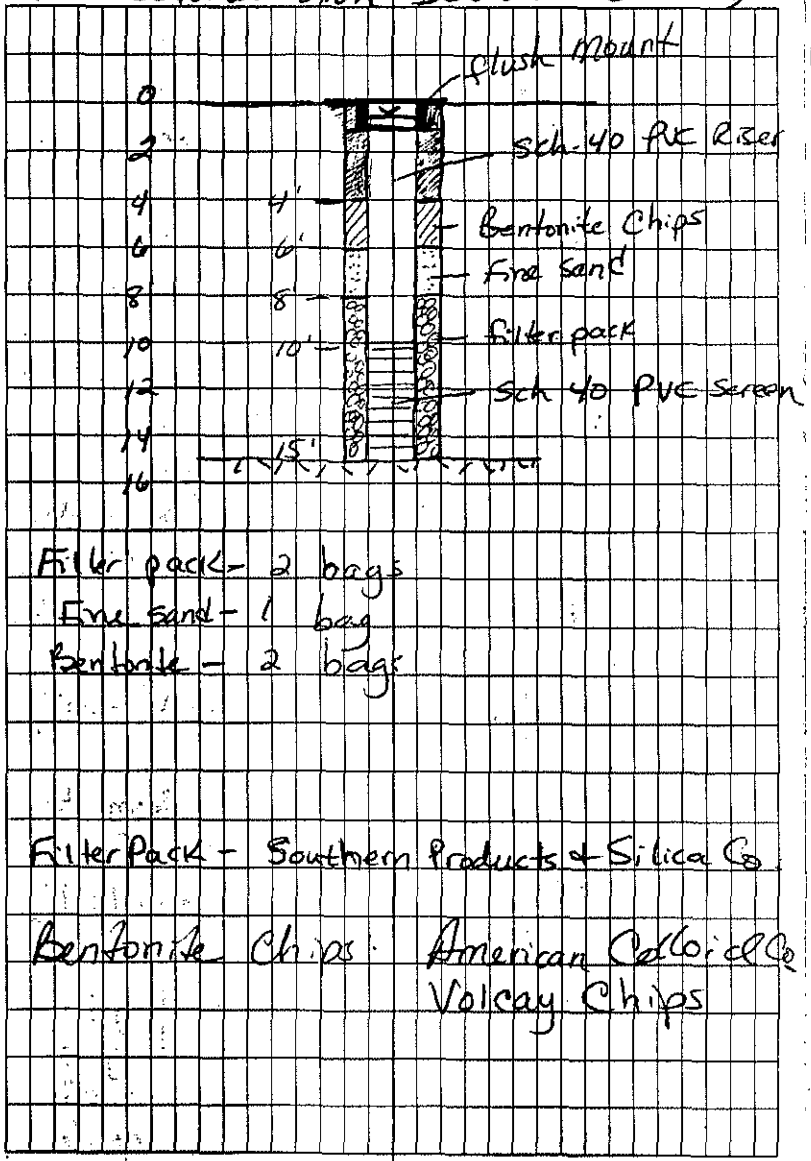
Abandon MSB1. Used 3 bags chips.

1636 - Complete installing MW-1.
Aaron Petri drops samples off @ lab.

1700 - LP & drillers leave site.



MW-1 Construction Details (MSB2)



Filter pack - 2 bags
Fine sand - 1 bag
Bentonite - 2 bags

Filter Pack - Southern Products & Silica Co.

Bentonite Chips - American Colloid Co
Volcay Chips

1/14/93

0700 - LP arrives on site. Drillers preparing to decon augers.

0718 Calibrate HNU to 100 ppm ISO BUTTLENE. 5.5 at span of 9.0.

0800 - Driller completing MW-1. Drillers deconning augers.

0912 - Drillers move over to MSB3 on east side of bldg.

0931 - Begin boring @ MSB3.

1020 - Met w/ Sharon Shaver from the WDNR showed her MW-1 completion. Although flush mount sunk into asphalt a fraction of an inch and some ponding of water is occurring, Sharon says important thing is thickness of seal - Two feet of chips is great - meets code.

1040 - Drillers hit bedrock @ depth of 10 1/2 ft. @ MSB3. Will leave hole open for now and move over to MSB4. The soil as MSB3 is moist, but no water to speak of.

1100 - Drillers move over to MSB4.

1115 - Break for lunch.

1145 - Back on site.

1150 - Begin Boring @ MSB4.

1315 - Hit bedrock @ 15' @ MSB4.

1320 - LP goes to make phone call.

1345 - LP back on site. Drillers will move over to MSB5 in south parking lot. Will leave MSB3 and MSB4 open overnight to see if they produce water.

1/14/93

1413 - Drillers moving over to decon pad to decon augers.

1448 - Move over to MSB5 in south parking lot.

1500 - Begin drilling @ MSB5.

1655 - Complete drilling @ MSB5 for the day. At depth of 23 ft. No bedrock yet.

1700 - LP + drillers leave site.

LD Peterson

1/15/93

0650 - LP arrives on site. Jeff Lamont (JL) here today.

0720 - Move over to MSB5 to complete boring.

HNu Calibration
51 ppm @ span = 8.6

1015 - Complete boring @ MSB5. Augered to 44 ft. Hit weathered bedrock

1045 - Collect GW grab from MSB5, MGW2.
Also collected duplicate - MSB2-FR

* pH = 7 Temp = 10.5°C Cond = 850 umhos

1100 - Hydraulic hose broke on rig. Downtime.

Wk. @ MW-6 is 10.54' BGS
Well depth = 26.12

* MW-6 has no flush mount cover. Well cap unlocked.
HNu well casing pegged 4 ppm.

1/15/93

1130 - LP & JL break for lunch. Make some phone calls.

1255 - Back on site. Drillers preparing to install monitoring well ~~piezometer~~ @ MSB5. ~~(MP-2)~~ (mw-3) Will screen from 30-35'.

1305 - Take W.L. @ P-6. W.L. @ 32' BGS

1410 - Precision Analytical courier picks up MGW2 samples.

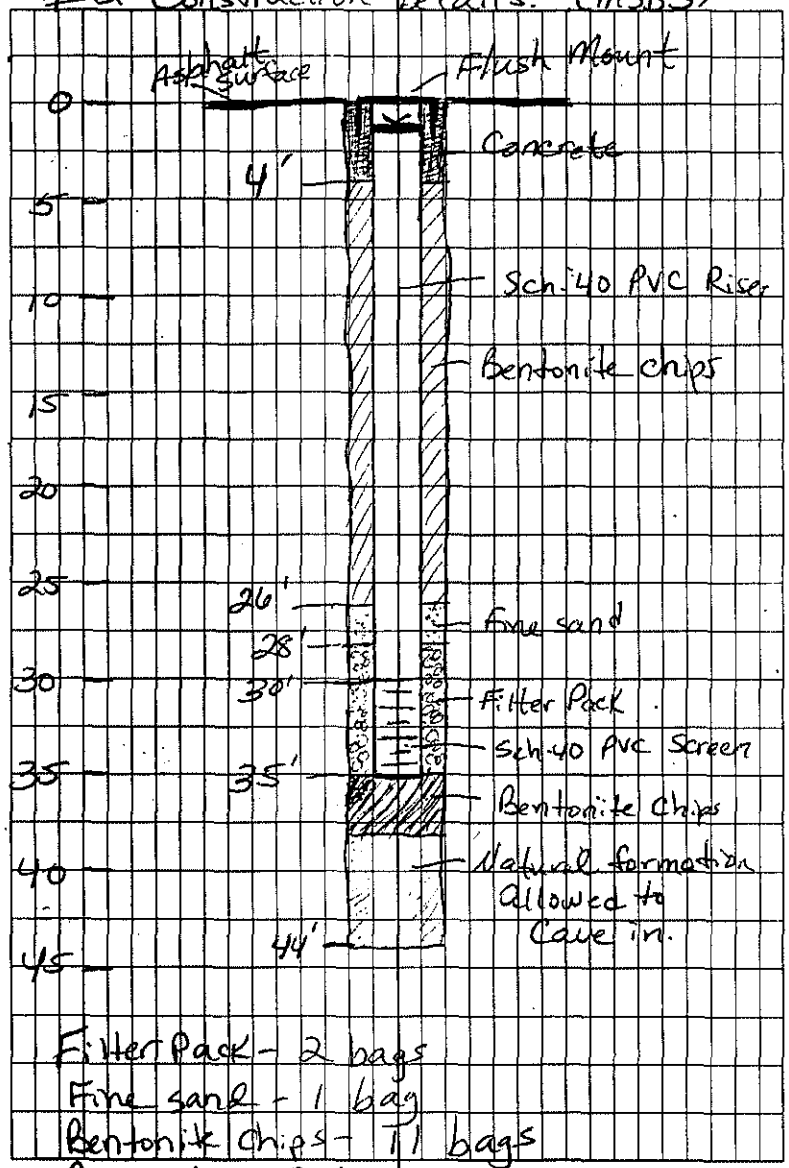
1455 - Complete installing chips @ ~~MW~~-3 Pulling away rig to decon pad. Preparing to complete ~~Pit~~ mw-3.

Clean water added to ~~MW~~ mw-3 during well installation. Added about 100 gal. water.

1510 - Jeff leaves site.

mw-3

~~MW-2~~ Construction Details. (MSB5)



Filter Pack - 2 bags
Fine sand - 1 bag
Bentonit chips - 11 bags
Concrete - 2 bags

1/15/93

1545 - Complete ~~[illegible]~~ MW-3.
Drillers deconning rig.

1633 - Drillers moving over to MSB4
to set up for rock drilling.
Will continue down hole
already started @ MSB4.

1648 - Leave site

J. J. Peters

1/18/93

0655 - AP arrives on site.
Jeff LaMont arrives shortly
after.

HNu Calibration:
HNu = 52.5 ppm @ Span = 8.1
Used 100 ppm Isobutylene

0740 - Drillers setting up @ MSB6
to drill bedrock boring.
Can't drill deeper @ MSB4
because not enough room to
manuever equipment. So
moved north of MSB4 about
20 ft.

0755 - Drillers go fill up tank with
water.

0845 - Auger down to 15 ft @
MSB6. Setting up rig
for bedrock boring.

1/18/93

1030 - Drillers having some problems getting rig changed over for bedrock drilling.

1140 - Break for lunch. Should be ready to start drilling afterwards.

1210 - Back on site.

1225 - Begin setting casing in hole @ MSB6. Will set casing a few feet into rock. Will then go back down with drill bit.

1250 - Hose is leaking.

1300 - Vince is going to call about getting new hose brought out.

1415 - "New" hose arrives.

1425 - Begin drilling @ MSB6

1540 - Still haven't reached bedrock. Casing still has some muck in it. Flushing it out.

1545 - Changing bit. Burned out other.

1605 - Bit changed. Begin drilling.

1615 - Not moving @ all through rock. At bedrock, but bit not advancing. Plugged? Chewed up?

1630 - Bit worn down. Will call it a day. Drillers will bring stronger bits from shop tomorrow.

1700 - Drillers & LP leave site.

K. D. Peterson

1/19/93

0700 - LP & drillers arrive on site.

0715 - Drillers getting water.

0830 - Setting up @ rig to continue boring @ MSB6.

0845 Begin drilling

0905 - Things still aren't working right. Pull out bit and casing.

0930 - Put bit back down hole. No casing as hole staying open. Begin drilling again.

0937 - HNu Calibration using 100 ppm Isobutylene
HNu = 53 ppm @ span = 8.5

1050 - Driller has brought up a couple of feet of weathered rock and clay.

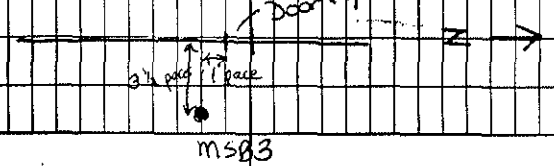
1/19/93

1040 - Sharon Shaver stops by. Says it would be a good idea to fill out borehole abandonment forms for all holes. We don't know where this investigation might go.

1110 - Took HNu reading of silty sand lense in rock core (approx. depth of 16 ft). Slight deflection of needle (0.5 - 1 ppm above BG).

1200 - Break for lunch.

1230 - Back on site.
Drillers are going to get something from the shop that can cut thru the weathered bedrock. Will spend the rest of the day developing wells & moving drums.

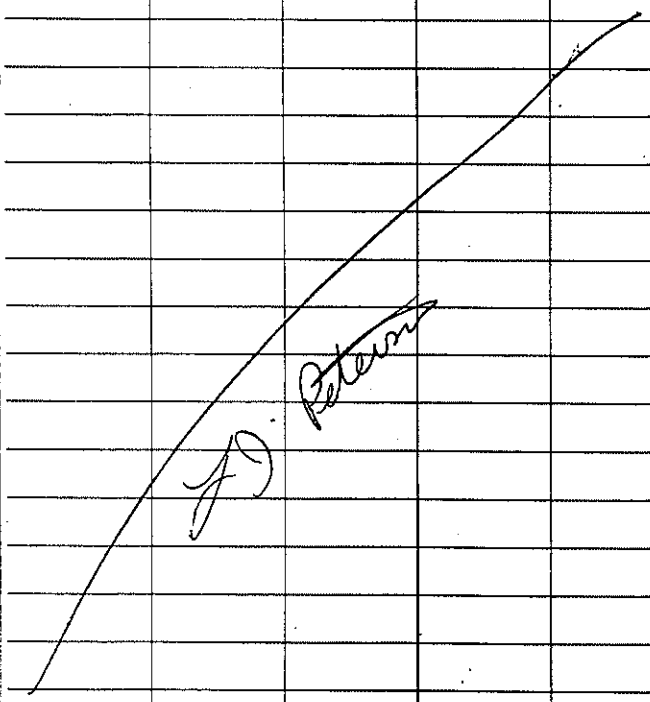


1/19/93

1430 - Drillers still moving drums.

Tried developing MW-3. Only got about 1 gal out. Will try again tomorrow.

LP leaves site. Vince thought they'd be done in about an hour.



1/20/93

0700 - LP + drillers onsite.

0745 - Drillers filling tank with water and are moving over to MSB6.

* Took W.L. @ MW-6 @ 0730.
W.L. = 10.64' BGS

0805 - W.L. @ MW-3 = 32.55' from TOC
T.D. = 34.6' from TOC

0823 - Moving water truck over to MSB6

0838 - Begin drilling @ MSB6

0845 - Drill crew arrives for inside borings. Setting up. Waiting for generator.

0925 - At MSB6, Crew advanced casing to 20 ft. to get out of weathered bedrock to competent rock

1/20/93

Drillers are now coring from 20 to 30 ft.

Note: From 15 to 20 ft, encountered weathered rock, gray clay, silt, and silty sand.

0950 - Obtained 10' core (20-30' BGS).

Other drill crew set up inside bldg. Still waiting for generator to arrive.

1018 - Have cored from 30 - ~~39.5~~ 40 ft. This 10' core not as fractured as 20 - 30 ft core.

Generator has arrived.

1135 - Bedrock Crew breaks for lunch. At depth of 60 ft. Not highly fractured. Blew out hole twice. Am Monitoring W.L.

1155 - W.L. came up about 14' in one-half hour @ MSB6.

1205 - P-le W.L. is 34.55 BGS

Mark + Scott (inside crew) go get something to eat.

1225 - Bedrock crew will blow water out of MSB6 one more time.

Inside crew drilling through 2nd layer of concrete @ MSB8. (South end of bldg)

1238 - Thru concrete @ MSB8. Begin augering.

1242 - HNu Bkgd @ MSB8 = 0.35 ppm.

At depth of 2 feet below floor surface. Drilled thru concrete, fill, then more concrete - site of former pit).

1/20/93

1305- Collected soil sample @ MSB8 from 2-4 ft. (Fine sand)

1325- HNu (headspace) of MSB8-SS-2-4 = BG

1344- Augering to 8 ft @ MSB8. Have collected soil sample from 4-6 ft. (silty clay)

(Will try to drive shelby from 8-10')

1410- HNu of MSB5S-4-6 = BG

Couldn't collect shelby from 8-10'. Too much resistance.

1415- Collected soil sample - MSB8-SS-8-10.

1500- Collect ~~Soil~~ Water sample from MSB6. Called MGWØ3. Also collected MS-MSD.

1515- Inside rig having trouble augering thru weathered bedrock. Still at 10 feet.

1540- Precision Analytical Courier picks up samples. Samples submitted:
MGWØ3
MGWØ3-MS/MSD } MSB6
MSB8-SS-8-10
MSB8-SS-10-12

1545- MSB6 GW parameters
pH = 7 (pH paper)
Cond = 850 µmhos (Cond meter may have short in cord)

1600- Driving spoon from 12-14 ft. @ MSB8.

1625- Hit bedrock @ 13'3" @ MSB8

1632- Inside crew leaves site

1655- Drillers & CP leave site

Peter

1/21/93

0710 - LP arrives on site.

0745 - Inside crew moving over to MSB9 at north end of bldg. Thought we might drill through manhole adjacent to site of degreaser, but a Scot employee thinks it's a cistern with a bottom. Used as a settling tank.

Other drill crew preparing to ream back down @ MSB6 to enlarge hole to 6" diameter before setting well.

0816 - HNu Calibration
HNu = 52 ppm Span = 7.9
Calibration gas is 100 ppm isobutylene

0824 - Start drilling @ MSB9.
HNu BG = 0.1 ppm

0851 - HNu breathing zone (BZ) and of Cuttings = BG.

0900 - Pushed shelby tube from 3-5 ft. Only recovered about 4 inches. Will drive spoon in same interval.

Other drill crew @ MSB6 has drilled down to about 31 feet below ground surface.

0905 - No recovery in 3-5' spoon. Hit rock. Will try augering through rock.

0913 - Driller not making headway. At depth of 3½ ft. Doesn't feel like rock. Another concrete floor?

0925 - Pulled augers. Drove spoon a bit. Must be a big rock. Will try again to drill through it.

0943 - Can't advance augers. Sounds like rock or concrete. Augers brought up 1-2" angular rocks.

1/21/93

1028- Will abandon MSB9 where were Currently at and move to a spot about 5 ft. south of the manhole. Crew is renting a Concrete cutter here in Cedarburg.

Crew @ MSB6 down to 50+ feet.

1100- At MSB6, Crew has reamed down to 60 ft. Are flushing out hole in preparation for setting well. Will call well MW-2.

1125- Concrete cutter arrives.

1200- Begin drilling at ~~new~~ MSB9 location.

1235- Tried pushing Shelby tube from 5-7 ft. Too much resistance.

1300- other crew preparing to decon screen & riser for MW-2.

1415- Augered to 11.5' @ MSB9. Met resistance. Bedrock.

Will Collect one grab sample — MSB9-GW-6-11.

There's about 2' water in hole

1430- Collected gw grab from MSB9

* Samples submitted to lab on 1/21/93
MSB9-GW-6-11
MSB9-SS-3-5
MSB9-SS-9-11

1500- Drillers have set well @ MSB6. Cleaning up.

Indoors crew cleaning up. Will grout holes tomorrow AM.

1545- Courier arrives from lab

1555- W.L. @ MW-6 = 10.53' BGS

1/21/93

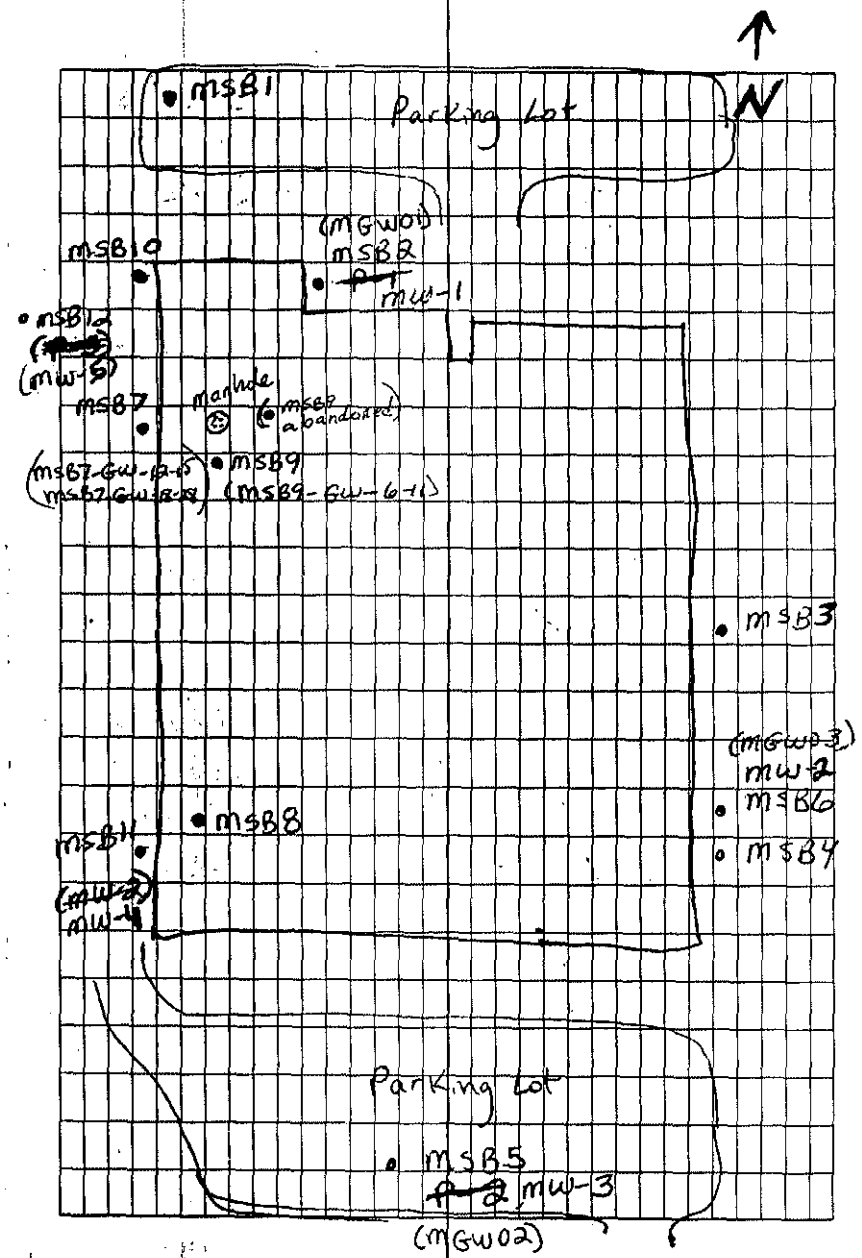
1600 - W.L. @ ~~B-3~~ mw-3 = 32.34' from TOC

1610 - W.L. at ~~B-1~~ mw-1 = 10.18' from TOC
Total well depth = 15.6' from TOC.

Driller decanning augers.

1700 - Leave site.

Peterson



1/22/93

0700 - LP & drillers arrive on site.

0710 - Drillers prepare to move rig to MSB7 alongside bldg. (west side)

0808 - Begin drilling @ MSB7

0815 - HNu Calibration
HNu = 52 ppm @ Span = 8.5
Cal. Gas is 100 ppm Isobutylene
CHem Hill equip. #2291

Other crew (Scott & Mark) arrive to grout two inside borings.
(Inside boring to 3½ ft - filled w/ chips & topped with Concrete)

0837 - Pushed shelby tube from 3-5 ft. @ MSB7. Full tube. Silty clay in tip of tube.

0905 - Pushed shelby from 9-11 ft.
(In gravel - sand unit)

0915 - Dennis Hintz from Cedarburg Water stopped out. OK to install well on their property by GW-3.

0940 - To bedrock @ MSB7 (depth 16') will drive well point and collect GW grab. - MSB7-GW-

0955 - LP goes to make phone call

1015 - Well point @ 11-13'. Only ½' water. Will drive point deeper

1028 - Well point @ 12-15'.
1.8 ft water
.3 Well ϕ = 3.5 gal

1638 - Purged 1½ gal or so from point. Purged dry. Will let sit awhile.

1100 - Only filled 3 VOA vials @ MSB7 Purged dry. Well point maybe getting plugged up w/ silt.

1/22/93

1105- Will core into bedrock @ MSB7 for 10 feet.

1130- Begin reaming down to competent bedrock @ MSB7.

Collected Field Blank (MFB01) as part of QC for western soil borings.

1205- Break for lunch.

1225- LP back on site.
Drillers still on break

1255- Begin bedrock coring @ MSB7.
Will start coring @ 18 ft.
(Driller first reamed thru weathered rock from 16-18')

1328- Collected rock core from 18-28'.

1340- About 5 ft. of water in MSB7
Will collect GW sample.

1/22/93

1400- Collected GW grab from MSB7.
(MSB7-GW-93-28).
Also collected duplicate.

*Note: W.L. about 11 ft BGS.

1437- Moving over to MSB10
(NW corner of bldg (outside))

1454- Begin drilling @ MSB10

1610- Stop @ 13.5 feet @ MSB10.
Sounds like pretty competent rock. Augers not budging.
About 0.2 ft. water in hole
Will let augers sit in hole over the weekend to see if I get more water in there.

1620- Courier from Precision Analytical picks up samples.

1640- Leave site.

Peterson

1/23/93

0700- Arrive on site.

0710- No water in borehole MSB10.
Crew preparing to core into bedrock.

Note: Samples sent on 1/22/93:
MSB7-3-5 Shelby Tube
MSB7-9-11 Shelby Tube
MSB7-SS-5-6
MSB7-SS-6-7
MSB7-SS-7-9
MSB7-GW-12-15 (VOAs only)
MSB7-GW-18-28. (also duplicate)
MSB10-SS-1-3
MSB10-SS-3-5
MSB10-SS-9-11
Field Blank- MFBØ1
Trip Blank- BLKØ5

0900- Begin setting casing @ MSB10

0957- Begin coring at MSB10-

1/25/93

1030- Thru coring. Obtained core from 13.5 - 23.5 ft.

1040- Will blow out hole 3 times before collecting grab sample.

1045- Air compressor not working.

1108- Compressor working.

1120- Blew out borehole 3 times.
Collected GW sample:
MSB10-GW-13-23.
Also collected MS-MSD.

Field parameters: pH = 7 (pH paper)

1136- Drillers break for lunch.

1150- LP breaks for lunch.

1209- Drillers begin pulling casing @ MSB10

1/25/93

1335 - Drillers setting up @ MSB11 - SW corner of bldg.

1352 - Begin boring @ MSB11.

1510 - Drilled to 15' @ MSB11. Weathered rock @ 13'.

Will collect GW grab from 12-15'.

* Note - Water gray + like a milkshake.

1600 - Collect gw grab from MSB11. (Purged approx 1.5 gal)

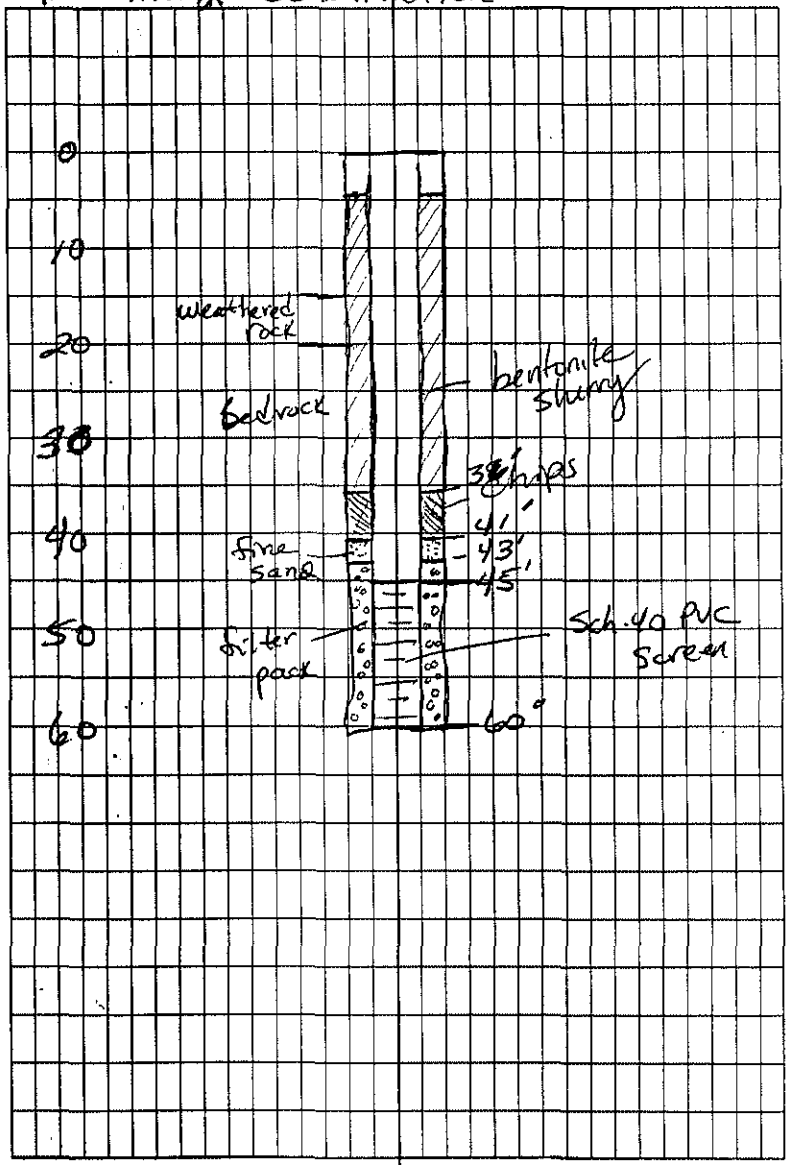
Drillers setting up for rock coring

1625 - PAL courier picks up samples:

- BLK Ø6
- MSB11-GW-12-15
- MSB11-SS-1-3
- MSB11-SSD-1-3 (duplicate)
- MSB11-SS-5-7
- MSB11-SS-9-11 (MS-MSD also)
- MSB11-SS-[redacted]13-15
- MSB10-GW-13-23 (MS-MSD also)
- MSB11-SS-3-5 (Shelby Tube)

(MSB6)

[redacted] MW-7 Construction Details



1/25/93

Field Parameters for GW grab MSB11-GW-12-15 @ 1640:

pH = 7 (pH paper)
Cond = 295 umhos *

* Cond. meter won't calibrate.

1650 - LP leaves site

J.D. Peterson

1/26/93

0700 - LP arrives on sit.

0721 - W.L. @ P-2 = 31.84 below TOC

	Well	Depth below TOC		time
(msb5)	~~P-5~~ MW-3	31.84	*	0721
	MW-6	10.20		0729
	P-6	33.63		0731
(msb2)	~~P-2~~ MW-1	10.05	*	0739
(msb6)	~~MW-2~~	~19.37 (BGS)		0744

* Wells have not yet been developed.

0800 - Vince & Gene arrive w/ part for rig.

Prepare to core @ MSB11.

0930 - Complete core @ MSB11 Interval from 18-28'

1000 - Collect GW grab from MSB11

1/26/93

1018 - LP goes to make phone call. Drillers on break.

1040 - LP back on site. Vince + Gene setting BK pump in MW-2.

Will set well @ MSB11 from 5-15 ft. (MW-4)

1109 - Plugged Core @ MSB11 w/ chips and capped with some sand. Deconned screen & riser. Now installing screen + rzer in hole.

Gene developing MW-2 (MSB6).

1145 - Thru developing MW-2 Purged 45 gal. Water turbid. Lt. brown.

Note: Bob said no fluid lost during drilling of MSB6. Vince said last 10-15 feet he had pump off — hole gaining water. Vince pumped out 50-70 gal.

1/26/93

1148 - Collected sample from MSB6 drummed water — 3 VOA vials. (DR1-MSB6)

Note - Sampled drums will be marked with a "✓".

1200 - Compete setting well @ MSB11. Pulling augers.

1220 - Drillers having lunch. Me too!

(W.L. @ MW-2 @ 1214 was ~ 20' BGS)

1245 - Drillers preparing to move over to MSB12 by City Well #3. Filling truck w/ water.

Mike Santos arrives from Layne to complete + develop wells.

1310 - Moving over to MSB12

1/26/93

1328- HNu Calibration
HNu = 51.5 ppm @ Span = 8.5
Calibration Gas = 100 ppm Isobutylene

1333. Start drilling @ MSB12.

1455- Complete drilling @ MSB12.
Depth = 19.5 ft.
About 1.8 ft. water in hole.

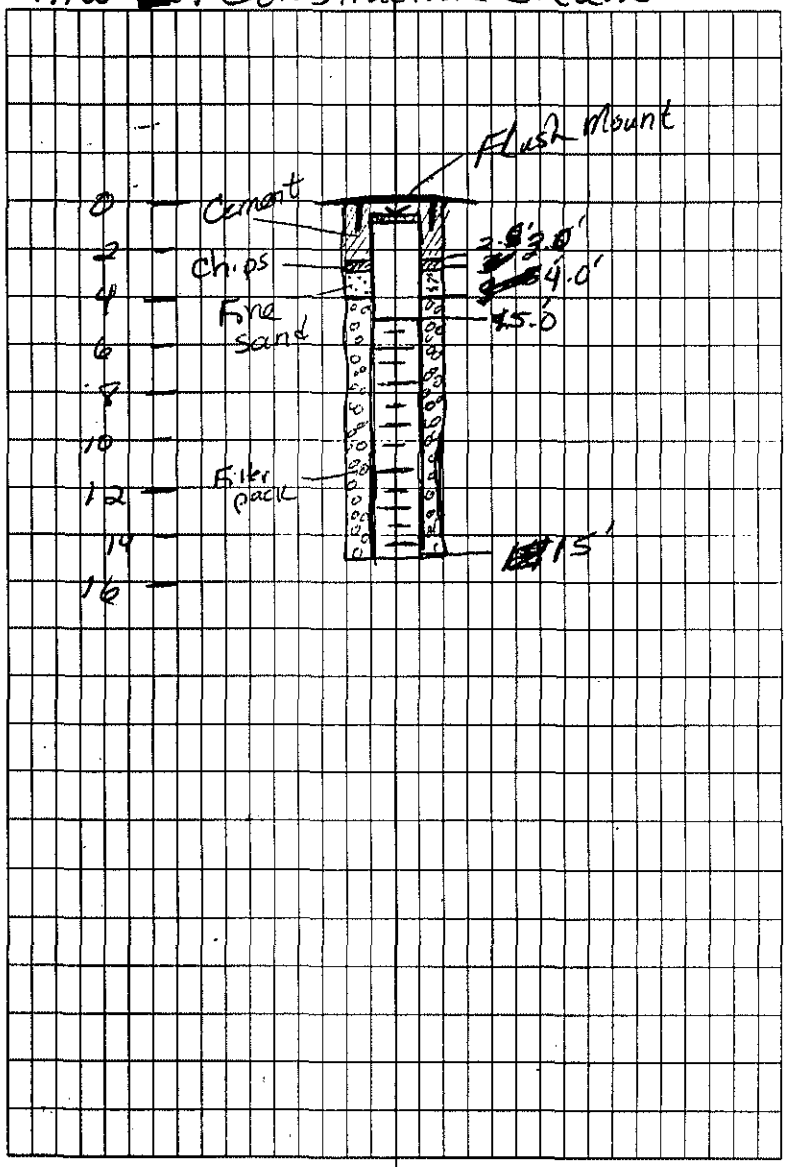
1523- Purged MSB12 dry. Letting it recover.

1600- Not getting water out of screen @ MSB12 (although bailer is wet)
Will let sit overnight.

1605- PAL courier picks up samples:
MSB11-GW-18-28
DR1- MSB6 (VOAs only)
BLKB7.

1610- Begin developing ~~MW-1~~ (MSB2)

(MSB11)
MW-4 Construction Details



1/24/93

1637 - Complete developing ~~MW-4~~ MW-1.
Purged 30 gal.
Turbid - Lt. brown
W.L. = 10.10' below TOC
following development.

1/27/93

0700 - Arrive on site

0715 - Sample MSB12.
Collected Field Blank after decanning bailer.

*Note: About 4-5 feet water in screen this AM. Turbid Lt. gray in color.

0750 - MW-4 (MSB11) W.L. is 7.73' below TOC prior to development.

Total depth of well is 14.4'
2 inches sediment on bottom.

0810 - Begin developing MW-4.

0820 - Installing screen and riser at MSB12. ~~RR/BD~~ (MW-5)

0900 - Thru installing well @ MW-5 RR/BD.
Cleaning up area.

1/27/93

0910 - Still developing MW-4. Letting it recover now + then as the W.L. drops down. Have purged about 12 gal so far.

0926 - W.L. @ MW-3 = 31.8' below TOC. Well depth = 34.6' from TOC. This is prior to development.

0929 - Complete developing MW-4. W.L = 10.36' from TOC. Purged about 20 gal.

0945 - Begin developing MW-3 (MSB5).

1000 - Completing MW-3 (MSB12)

1014 - Only purged about 0.5 gal from MW-3 so far. Added ½ gal DI water to help surge well.

1038 - Thru developing MW-3. Only purged about 1.5 gal. Purged dry.

1105 - W.L. @ MW-5 prior to development is 15.67' Below TOC. Well depth is 19.2'.

1110 - Begin developing MW-5. (Surge + bail)

1140 - Complete developing MW-5. Purged 20 gal.

1145 - W.L following development is 15.42'

Drillers loading up and cleaning up area.

1210 - Scot employee moving drums inside to thaw out.

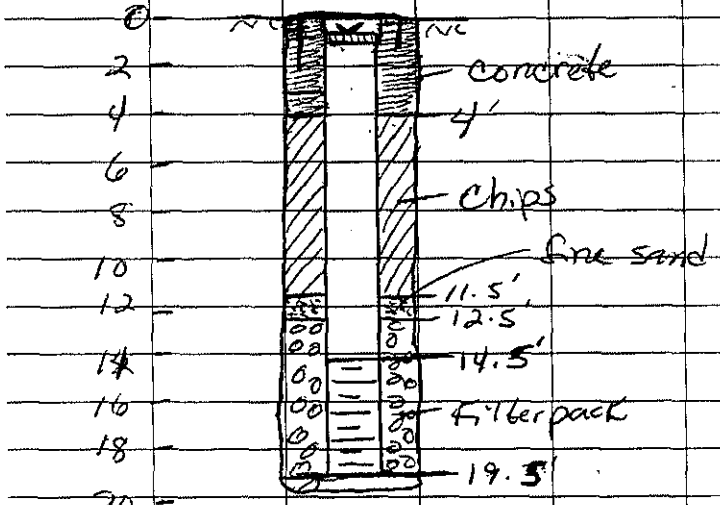
1245 - LP leaves site to bring samples to PAL.

1410 - Deliver samples to PAL.
MSB12-GW-14-19
MFB02 (field blank).

J.D. Peter

(MSB12)

MW-3 ~~(MSB6)~~ Construction Details



2/2/93

0710 - AP and AP (Aaron Petri) arrive on site to sample drummed cuttings + water.

0740 - Collect composite soil sample from suspected "dirty" drums:

MSB7
MSB8
MSB9
MSB10
MSB11

} 6 drums total
Sample Nos. MDR1-5S

0900 - Complete sampling drummed water. Sampled 10 drums — Sample Nos: MDR2-GW to MDR11-GW. (Incl. 2 drums that are soil + water mixed)

0945 - Waiting for Dan Chatfield/Chem Hill to return with tripod for surveying. Dan & Aaron will survey in wells and borings.

2/2/93

Water Levels:

Well No.	Depth (from TOC)	Time
MW-1 (MSB2)	10.18	1046
MW-3 (MSB5)	32.46	1024
MW-5 (MSB12)	15.77	1052
MW-2 (MSB10)	20.23	1037
MW-4 (MSB11)	10.02	1013
MW-6	10.32	1007
P-6	33.62	1009

1100 - LP leaves site.
Dan + Aaron Surveying.

1130 - LP drops samples off at PAL.

LD Peterson

Pump Test - Feb. 1993

Water Levels: Pump Test

City Well #3 turned off @ 8 AM on Feb. 10, 1993 - per Dennis Hintz.

WL's before pump off:

Date	Well No.	Depth to Water	Time
2/9/93	MW-1	10.21	1606
2/9/93	MW-2	20.19	1544
2/9/93	MW-3	32.4	1520
2/9/93	MW-4	10.40	1558
2/9/93	MW-5	15.81	1537
2/9/93	MW-6	10.35	1553
2/9/93	P-6	33.53	1555

2/10/93 - City Well No. 3 off

Date	Well No.	Depth	Time
2/10/93	MW-1	10.24	1538
	MW-2	20.25	1554
	MW-3	32.23	1535
	MW-4	10.11	1541
	MW-5	15.25	1601
	MW-6	10.40	1544
	P-6	33.39	1546

2/15/93

Water Levels:

Well No.	Depth	Time
mw-1	10.30	1614
mw-2	20.21	1618
mw-3	~~*~~	
mw-4	10.17	1603
mw-5	—	
mw-6	10.48	1606
P-6	32.90	1607

* Couldn't find mw3 & mw5 beneath the ice and snow.

2/18/93 - Water Levels

Well No.	Depth	Time	
mw-1	10.26	1555	
mw-2	* —		Didn't measure
mw-3	—		Couldn't find
mw-4	10.21	1539	
mw-5	—		Couldn't find
mw-6	10.50	1543	
P-6	33.10	1544	

Drum Count - Soil

MSB1	1	- clean
MSB2	1	- clean
MSB3	1	- clean
MSB4	11	- clean
MSB5	111	- clean
MSB6		
MSB7	1	
MSB8	1	
MSB9	1	
MSB10	1	
MSB11	11	
MSB12	11	- clean
Decon	1	

Drummed Water = 9

2 drum soil + water

Total = 28 drums

2/24/93

Water Levels

Well No	Depth	Time
mw-1	10.46	0923
mw-2	20.43	0907
mw-3	—	
mw-4	—	
mw-5	16.07	0930
mw-6	10.60	0942
P-6	32.72	0944

1000 - City Well No. 3 turned on.

Water Levels

Well No	Depth	Time
mw-1	10.43	1052
mw-2	20.43	1057
mw-3	—	
mw-4	—	
mw-5	15.92	1045
mw-6	10.60	1048
P-6	33.11	1049

2/25/93

0750 - LP arrives @ site to Sample drums for disposal purposes

1000 - Complete drum sampling. Collected 1 gt. Composite of Soil drums and 2 - 1 gt. Composite of drummed water.

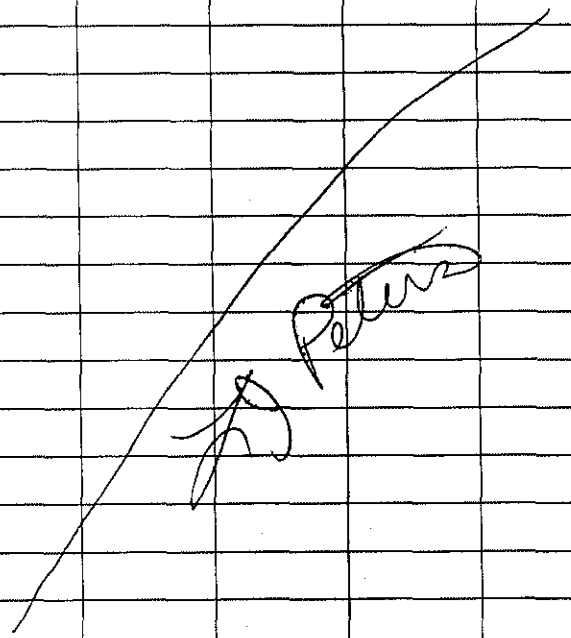
Water Levels

Well No	Depth	Time
mw-1	—	
mw-2	20.40	1016
mw-3	—	
mw-4	—	
mw-5	15.94	1023
mw-6	10.61	1006
P-6	33.59	1007

1100 - Delivered water sample to Precision Analytical. Fed Ex'd Soil sample to Mary Murphy at E+K.

2/26/93

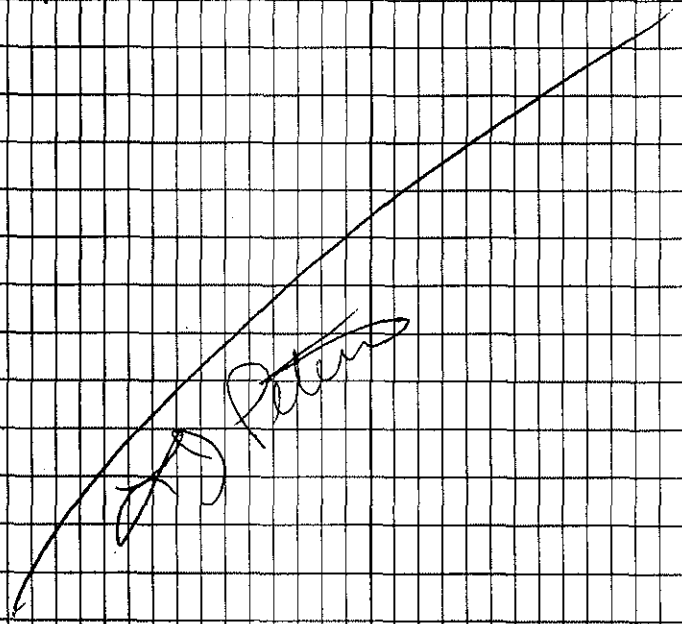
Water Levels	Depth	Time
MW-1	—	
MW-2	20.45	1553
MW-3	—	
MW-4	10.34	1602
MW-5	16.08	1546
MW-6	10.61	1558
P-6	33.24	1557



3/3/93

Water Levels

Well No.	Depth	Time
MW-1	10.52	1551
MW-2	20.44	1556
MW-3	32.43	1541
MW-4	10.35	1544
MW-5	16.13	1602
MW-6	10.65	1548
P-6	34.32	1549



ATTACHMENT 4
CHAIN-OF-CUSTODY FORMS

Precision Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212
Phone: (414) 272-5222
Fax: (414) 272-6949

CLIENT INFORMATION

Project Manager: Chris Jo Eisenhauer
Company: CH2M HILL
Address: 310 W. Wisconsin Ave Ste 700
Milwaukee WI 53203
Phone: (414) 272-2426 Fax: (414) 272-4408
Project: Mercury, Maine
Quote/Reference:
Reports to be sent to: Chris Ollard

Chain of Custody

Page 1 of 2 No. 7539

SPECIAL INSTRUCTIONS:
Call for Bottles w/ questions

Property Owner:
Property Address:
Telephone Number:

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: ____ C
Ice/Ice

SAMPLE HANDLING
___ Nonhazardous ___ Reactive
___ Flammable ___ Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify)

Turnaround Time
X Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: ____
** WAS LAB NOTIFIED (Y/N) ____

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: Fill in spaces with bottles per test	FILTERED (YES/NO)	PRESERVED (CODE)	REFRIGERATED (YES/NO)	REMARKS
									TCE 1,1,1-TCA 1,2-DCE VOC		A	A	
	2/2	0815		✓	3	2	MDR2-GW	MSB6	3				
		0815		✓	3	2	MDR3-GW	Decon	3				
		0830		✓	3	2	MDR4-GW	MSB10	3				
		0830		✓	3	2	MDR5-GW	MSB7	3				
		0830		✓	3	2	MDR6-GW	MSB10	3				
		0840		✓	3	2	MDR7-GW	Decon	3				
		0856		✓	3	2	MDR8-GW	MSB11	3				
		0850		✓	3	2	MDR9-GW	MSB11	3				
		0900		✓	3	2	MDR10-GW	MSB12	3				
	↓	0900		✓	3	2	MDR11-GW	MSB6	3				

Preservation Code
A-None B-HNO3
C-H2SO4 D-NAOH
E-HCL F-____
M-MEOH

REMARKS:

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ___ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
[signature]	2/2/93 11:20am	[signature]
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

PAL Precis Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

Project Manager: John Fies
Company: CH2M Hill
Address:
Phone: (414 222 2426 Fax: ( )
Project: Mercury Marine
Quote/Reference:
Reports to be sent to: Chris Ohland

Chain of Custody

Page 2 of 2 No 7542

SPECIAL INSTRUCTIONS:
Call Lor: Bootz
w/ Questions

Property Owner:
Property Address:
Telephone Number:

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig. ? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature
Blank: ____ C
Up. Lab

SAMPLE HANDLING
___Nonhazardous ___Reactive
___Flammable X Work in Hood
___Skin Irritant X Wear Gloves
___Highly Toxic ___Infectious
___Other (specify)

Turnaround Time
X Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: ____
** WAS LAB NOTIFIED (Y/N) ____

FILTERED (YES/NO)
PRESERVED (CODE)
REFRIGERATED (YES/NO)

Preservation Code
A-None B-HN03
C-H2SO4 D-NAOH
E-HCL F-____
M-MEOH

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: VOC	Protocol A	TCLP Metals	Fuel Fuel Solvent Scan	TOX	TOC	REMARKS: Fill in spaces with bottles per test
	2/2						BLK09		1						Trip Blank
	2/2		X		3	3	MDR1-55	Drum (MSB7, 8, 9, 10, 11)		X	X	X	X	X	Call Lor. Bootz for clarification of analyses needed.

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ___ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date / Time	Received By (Signature)
A Peterson	2/2/93 11:30am	Kath Kell
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

PAL Preci. Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

CLIENT INFORMATION

Project Manager: John Fleiner
Company: Cham Hill
Address: 310 W. Wisconsin Ave. Suite 700
Milwaukee, WI 53203
Phone: (414) 272-2426 Fax: (414) 272-4408
Project: Mercury Marine
Quote/Reference:
Reports to be sent to: Chris Ohland

Chain of Custody

Page 1 of 1 № 7538

SPECIAL INSTRUCTIONS:
Call Lori Bootz w/ questions

Property Owner:
Property Address:
Telephone Number:

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: ____ C

SAMPLE HANDLING
___ Nonhazardous ___ Reactive
___ Flammable ___ Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify) ____

Turnaround Time
___ Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: ____
** WAS LAB NOTIFIED (Y/N) ____

FILTERED (YES/NO)
PRESERVED (CODE) A C A B
REFRIGERATED (YES/NO)

Preservation Code
A-None B-HN03
C-H_2SO_4 D-NAOH
E-HCL F-____
M-MEOH

REMARKS:

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: VOC	COD, TOC	Alkalinity	Iron, Hardness			Fill in spaces with bottles per test
	1-27	0730		X	6	2	MSB12-GW-14-19	MSB12	3	1	1	1			
	1-27	0800			6		MFB02		3	1	1	1			Field Blank
	1-27	0800			1		BLK08		1						Trip Blank

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ___ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

PAL Preci. Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

Project Manager: John Fleck cr
Company: CH2M Hill
Address: 310 W. Wisconsin Ave, Suite 700
Milwaukee, WI 53203
Phone: (414) 272-2426 Fax: (414) 272-4408
Project: Mercury Marine
Quote/Reference:
Reports to be sent to: Chris Ohland

Chain of Custody

Page 1 of 1 № 8772

SPECIAL INSTRUCTIONS:
Call Lori Bootz w/ questions

Property Owner:
Property Address:
Telephone Number:

Del'v.: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: _____ C

SAMPLE HANDLING
___ Nonhazardous ___ Reactive
___ Flammable ___ Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify) _____

Turnaround Time
___ Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: _____
** WAS LAB NOTIFIED (Y/N) ____

FILTERED (YES/NO)
PRESERVED (CODE) A C A B
REFRIGERATED (YES/NO)

Preservation Code
A-None B-HN03
C-H_2SO_4 D-NAOH
E-HCL F-____
M-MEOH

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: Fill in spaces with bottles per test: VOC	COD, TOC	Alkalinity	Iron hardness			REMARKS
	1-26	0945		X	5	2	MSB11 GW 18-28	MSB11	3	1	1	1			
	1-26				1		BLK07		1						Trip Blank
	1-26	1145		X		2	DR1-MSB6	MSB6 DRUM	3						TCE; 1,1,1-TCA; 1,2-DC
	~~1-26~~	~~1515~~		~~X~~			~~MSB12-18-28 GW~~	~~MSB12~~							

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ____ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
Dawn Peterson	1/26 1400	K Lesh
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

Precision Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

CLIENT INFORMATION

Project Manager: John Fleis
Company: CH2M Hill
Address: 310 W. Wisconsin Ave. Suite 700
Milwaukee, WI 53280
Phone: (414) 272-2426 Fax: (414) 272-4408
Project: Mercury Marine
Quote/Reference:
Reports to be sent to: Chris Ohland

Chain of Custody

Page 1 of 2 № 7545

SPECIAL INSTRUCTIONS:
Call Lori Bootz with questions

Property Owner:
Property Address:
Telephone Number:

Del'y: Hand Comm. Ship Cont. OK? Y N N/A Rec'd Refrig.? Y N N/A Seals OK? Y N N/A Samples leaking? Y N N/A Comments:

Temperature Blank: ____ C

SAMPLE HANDLING
___ Nonhazardous ___ Reactive
___ Flammable ___ Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify)

Turnaround Time
___ Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed:
** WAS LAB NOTIFIED (Y/N) ____

FILTERED (YES/NO)
PRESERVED (CODE): A C B B A A
REFRIGERATED (YES/NO)

Preservation Code: A-None B-HN03 C-H_2SO_4 D-NAOH E-HCL F-____ M-MEOH

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: VOC	COD, TOC	Alkalinity	Iron, Hardness	TOC	Alkalinity	REMARKS: Fill in spaces with bottles per test
	1-25				1		BLK06		1						Trip Blank
	1-25	1120		X	6	2	MSB10-GW-13-23	MSB10	3	1	1	1			
	1-25	1120		X	6	2	MSB10-GW-13-23	MSB10	6						MS-MSD
	1-25				4	3	MSB11-SS-1-3	MSB11	2				2		
					4	3	MSB11-SSD-1-3	MSB11	2				2		Duplicate
					4	3	MSB11-SS-5-7	MSB11	2				2		
					4	3	MSB11-SS-9-11	MSB11	2				2		
					4	3	MSB11-SS-9-11	MS-MSD (MSB11)	4						MS-MSD
					4	3	MSB11-SS-13-15	MSB11	2				2		
	1-25	1530		X	6	2	MSB11-GW-12-15	MSB11	3	1		1		1	

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ____ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
[signature]	1/25/ 1125	[signature]
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

PAL Precis... Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

Project Manager: John Fleiner
Company: Cham Hill
Address: Milwaukee, WI
Phone: (414) 272-2926 Fax: (414) 272-1408
Project: Mercury Maine
Quote/Reference:
Reports to be sent to: Chris Ohland

Chain of Custody

Page 2 of 2 No 8767

SPECIAL INSTRUCTIONS:
Call for Boats w/ questions

Property Owner:
Property Address:
Telephone Number:

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature
Blank: ____ C

SAMPLE HANDLING
___ Nonhazardous ___ Reactive
___ Flammable ___ Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify) ____

Turnaround Time
___ Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: ____
** WAS LAB NOTIFIED (Y/N) ____

ANALYSIS: Geotechnical Analysis

FILTERED (YES/NO)
PRESERVED (CODE)
REFRIGERATED (YES/NO)

Preservation Code
A-None B-HN03
C-H_2SO_4 D-NAOH
E-HCL F-____
M-MEOH

REMARKS:

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	Fill in spaces with bottles per test						
	1-25				1	3	MSB11-SS-3-5	MSB11	1						Shelby Tube
1															

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ____ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date / Time	Received By (Signature)
[signature]	1/25 4/25	[signature]
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

PAL Preci. Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

Project Manager: John Fleis
Company: CHam Hill
Address: 310 W. Wisconsin Ave, Suite 700
Milwaukee, WI 53203
Phone: (414) 272-2426 Fax: (414) 272-4408
Project: Mercury Marine
Quote/Reference:
Reports to be sent to: Chris Ohland

Chain of Custody

Page 1 of 2 № 8770

SPECIAL INSTRUCTIONS:
Call Lori Bootz with questions

Property Owner:
Property Address:
Telephone Number:

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N* N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: ____ C

SAMPLE HANDLING
___ Nonhazardous ___ Reactive
___ Flammable ___ Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify)

Turnaround Time
___ Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: _____
** WAS LAB NOTIFIED (Y/N) ____

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2), Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: VOC	[redacted]	TOC	Alkalinity	COD, TOC	Iron, Hardness	FILTERED (YES/NO)	PRESERVED (CODE)	REFRIGERATED (YES/NO)	REMARKS
									N	N	N	N	N	N				
									A	[redacted]	A	A	C	B				
	1-22	1100					BLK05		1									Trip Blank
	1-22	1010		X		2	MSB7-GW-12-15	MSB7	3									
	1-22					3	MSB7-SS-5-6	MSB7	1		1							
	1-22					3	MSB7-SS-6-7	MSB7	2		2							
	1-22					3	MSB7-SS-7-9	MSB7	2		2							
	1-22	1130					MFB01 [redacted]		3			1	1	1				Equipment Blank
	1-22	1400				2	MSB7-GW-18-28	MSB7	3			1	1	1				
	1-22	1400				2	MSB7-GWD-18-28	MSB7	3			1	1	1				Duplicate
	1-22	1530				3	MSB10-SS-1-3	MSB10	2		2							
	1-22	1530				3	MSB10-SS-3-5	MSB10	1		1							

Preservation Code
A-None B-HN03
C-H_2SO_4 D-NAOH
E-HCL F-____
M-MEOH

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ___ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
Tom J. Peterson	1/22/93 4:20 PM	
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

PAL Preci. Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

Project Manager: John Fleis er
Company: Cham Hill
Address: Milwaukee, WI
Phone: (414) 272-2426 Fax: (414) 272-4408
Project: Mercury Maine
Quote/Reference:
Reports to be sent to: Chris Ontland

Chain of Custody

Page 2 of 2 No. 8771

SPECIAL INSTRUCTIONS:
Call Lori Bootz with questions

Property Owner:
Property Address:
Telephone Number:

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig. ? Y N N/A
Seals OK ? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: ____ C

SAMPLE HANDLING
___ Nonhazardous ___ Reactive
___ Flammable ___ Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify)

Turnaround Time
___ Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed:
** WAS LAB NOTIFIED (Y/N) ____

Preservation Code: A-None B-HNO3 C-H2SO4 D-NAOH E-HCL F-____ M-MEOH

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: Geotechnical Analyses	VOC	TOC	FILTERED (YES/NO)	PRESERVED (CODE)	REFRIGERATED (YES/NO)	REMARKS: Fill in spaces with bottles per test
	1-22	0830			1	3	MSB7-3-5	MSB7	1				A	A	Shelby Tube
	1-22	0915			1	3	MSB7-9-11	MSB7	1						Shelby Tube
	1-22	1600				3	MSB10-55-9-11	MSB10		2	2				

Disposition of unused portion of sample
Laboratory Should:
___ Dispose * ___ Retain for ___ days
___ Return ___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
Thomas J. Peters	1/22/93 4:20 P	Richard Lukey
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

PAL Precision Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

CLIENT INFORMATION

Project Manager: John Fleis PE
Company: Cham Hill
Address: 310 W. Wisconsin Ave. Suite 700
Milwaukee, WI 53203
Phone: (414) 272-2426 Fax: (414) 272-4408
Project: Mercury Marine Plant No. 1
Quote/Reference:
Reports to be sent to: Chris Ohland

Chain of Custody

Page 1 of 1 № 8769

SPECIAL INSTRUCTIONS:
Contact Lori Boote with questions

Property Owner:
Property Address:
Telephone Number:

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: ____ C

SAMPLE HANDLING

- ___ Nonhazardous
- ___ Flammable
- ___ Skin Irritant
- ___ Highly Toxic
- ___ Other (specify)
- ___ Reactive
- ___ Work in Hood
- X Wear Gloves
- ___ Infectious

Turnaround Time

- ___ Normal
- ___ Rush ** (Please refer to Quote/Reference Number)

Date Needed: _____

** WAS LAB NOTIFIED (Y/N) ____

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: VOC	Alkalinity	COD TOC	Iron Hardness	TOC	Fill in spaces with bottles per test	REMARKS
	1-21						BLK04		1						Trip Blank
	1-21	1430		X		2	MSB9-GW-611	MSB9	3	1	1	1			
	1-21					3	MSB9-SS-9-11	MSB9	2				2		
	1-21					3	MSB9-SS-3-5	MSB9	2				2		

FILTERED (YES/NO): N N N N N
PRESERVED (CODE): A A C B A
REFRIGERATED (YES/NO)

Preservation Code
A-None B-HNO3
C-H2SO4 D-NAOH
E-HCL F-____
M-MEOH

REMARKS:

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ___ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
Dawn Peterson	1/21/93 345 PM	Richard Lobring
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

Precision Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

Project Manager: John Fless
Company: CH2M HILL
Address: 310 W. Wisconsin Ave Suite 700
Milwaukee WI 53203
Phone: (414) 272-2426 Fax: (414) 272-4408
Project: Mercury Marine Plant No. 1
Quote/Reference:
Reports to be sent to: Chris Ohland

Chain of Custody

Page ____ of ____ № 8768

SPECIAL INSTRUCTIONS:
Contact Lori Booth with questions

Property Owner:
Property Address:
Telephone Number:

Del'y: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: ______ C

SAMPLE HANDLING

___ Nonhazardous
___ Flammable
___ Skin Irritant
___ Highly Toxic
___ Other (specify) ______
___ Reactive
___ Work in Hood
X Wear Gloves
___ Infectious

Turnaround Time

___ Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: ______
** WAS LAB NOTIFIED (Y/N) ____

FILTERED (YES/NO)
PRESERVED (CODE): E, A, C, B
REFRIGERATED (YES/NO)

Preservation Code
A-None B-HN03
C-H2SO4 D-NAOH
E-HCL F-______
M-MEOH

TOTAL NUMBER OF CONTAINERS
MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)

ANALYSIS — Fill in spaces with bottles per test

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX	FIELD ID	LOCATION / DESCRIPTION	VOC	Alkalinity	COD TOC	Iron hardness	TOC		REMARKS
	1-20	1500		X		2	MGW03	MSB6	3	4	1	1			
	1-20						BLK03		1						Trip Blank
	1-20	1500		X		2	MGW03-MS-MSD	MSB6	9	2	2	2			MS-MSD
	1-20	1400				3	MSB8-SS-8-10	MSB8	2				2		
	1-20	1400				3	MSB8-SS-10-12	MSB8	2				2		

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
___ Retain for ___ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date / Time	Received By (Signature)
[signature]	1/20/93 3:10 PM	[signature]
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

Chain of Custody

Page ___ of ___ № 8775

Precision Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

CLIENT INFORMATION

Project Manager: John Fleis er
Company: CH2M HILL
Address: 310 W. Wisconsin Ave. Suite 700
Milwaukee, WI 53201
Phone: (414) 272-2426 Fax: ( )
Project:
Quote/Reference:
Reports to be sent to: CHRIS OHLAND

SPECIAL INSTRUCTIONS:
Contact Lorie Bootz with any Questions.

Property Owner:
Property Address:
Telephone Number:

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: ____ C

SAMPLE HANDLING

___ Nonhazardous ___ Reactive
___ Flammable X Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify) _____

Turnaround Time

X Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: _____
** WAS LAB NOTIFIED (Y/N) ____

Preservation Code: A-None B-HNO3 C-H2SO4 D-NAOH E-HCL F-____ M-MEOH

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	ANALYSIS: VOC	Alkalinity	COD-TOC	TKN/NH3 Hardness	FILTERED (YES/NO)	PRESERVED (CODE)	REFRIGERATED (YES/NO)	REMARKS:
	1-15	10:00		X		2	MGWØ2	MSB5	3	1	1	1				
	1-15	10:00		X	1	6	BLK-02		1							
	1-15	10:00		X		2	MGWØ2-FR	Duplicate @ MSB5	3	1	1	1				Duplicate
									1							

Fill in spaces with bottles per test

Disposition of unused portion of sample
Laboratory Should:
● Dispose *
___ Return
___ Retain for ___ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
Karen Potter	1/15/93 2:10 P.M.	Richard Lee
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

PAL Precis Analytical Laboratory
205 W. Galena
Milwaukee, WI 53212

Phone: (414) 272-5222
Fax: (414) 272-6949

Project Manager: John Tlei
Company: CH2M HILL
Address: 310 W. WISCONSIN AVE. SUITE 700
Milwaukee, WI 53201
Phone: (414) 272-2426 Fax: ( )
Project: GLO 33316.BB.00
Quote/Reference:
Reports to be sent to: CURTIS OHLAND

Chain of Custody

Page ____ of ____ 8756

SPECIAL INSTRUCTIONS:
CONTACT CURTIS OHLAND AT CH2M HILL W/ ANY QUESTIONS (414) 272-2426

Property Owner:	
Property Address:	
Telephone Number:	

Del'v: Hand Comm.
Ship Cont. OK? Y N N/A
Rec'd Refrig.? Y N N/A
Seals OK? Y N N/A
Samples leaking? Y N N/A
Comments:

Temperature Blank: ____ C
C24 FDE

SAMPLE HANDLING
___ Nonhazardous ___ Reactive
___ Flammable ___ Work in Hood
___ Skin Irritant X Wear Gloves
___ Highly Toxic ___ Infectious
___ Other (specify) _____

Turnaround Time
___ Normal
___ Rush ** (Please refer to Quote/Reference Number)
Date Needed: _____
** WAS LAB NOTIFIED (Y/N) ____

ANALYSIS: VOCs | E | C | B | IRON, MANGANESE

FILTERED (YES/NO)
PRESERVED (CODE)
REFRIGERATED (YES/NO)

Preservation Code
A-None B-HNO3
C-H_2SO_4 D-NAOH
E-HCL F-____
M-MEOH

REMARKS:

LAB USE ONLY	DATE 1993	TIME	COMP	GRAB	TOTAL NUMBER OF CONTAINERS	MATRIX: Surface Water(1), Ground Water(2) Soil(3), Solid/Liquid Waste(4/5), Other(6)	FIELD ID	LOCATION / DESCRIPTION	Fill in spaces with bottles per test						
	1-13	16:00		X	6	2	MGW01	mm	3	1	1	1			
	1-13	16:00		X	1	6	BLK01	mm	1						

Disposition of unused portion of sample
Laboratory Should:
___ Dispose *
___ Return
X Retain for ____ days
___ Other

* Disposal charges listed in fee schedule

Relinquished By (Signature)	Date /Time	Received By (Signature)
[signature]	1/13/93 16:50	[signature]
Relinquished By (Signature)	Date / Time	Received By (Signature)
Relinquished By (Signature)	Date / Time	Received For Laboratory By: (Signature)

White - Lab Canary - Report Pink - File Golden Rod - Customer

APPENDIX B
SOIL AND GROUNDWATER RAW ANALYTICAL DATA

				1,1 Dichloroethane			cis 1,2 Dichloroethene			1,1,1 Trichloroethane				TCE	
Sample #	% IS PID	% IS Hall	% Solids	Maxima	Calculated	Reported	Maxima	Calculated	Reported	Maxima	Calculated	Reported	Maxima	Calculated	Reported
2040-12	77	74	86				16.27	18.9186047	19	50.34	58.5348837	59	187.05	217.5	220
1219-04	63	59	74							1.42	1.91891892	1.9			
1219-06	78	75	89	7.51	8.43820225	8.3	3.93	4.41573034	4.3	57.63	64.752809	64	38.78	43.5730337	43
1219-07	47	74	93				18.45	19.8387097	20	57.29	61.6021505	62	85	91.3978495	91
1219-08	15	34	87	7.97	9.16091954	8.9	15.52	17.8390805	17	89.34	102.689655	99	59.74	68.6666667	66
1204-03	61	89	83	1.62	1.95180723	2							47.16	56.8192771	65
1204-04	85	73	85										77.84	91.5764706	78
1204-05	93	95	93										163.38	175.677419	160
1204-09	75	71	84												
1204-13	74	60	96										7.28	7.58333333	7.6
1194-03	32	57	95										138.35	145.631579	180
1194-04	30	56	78										78.17	100.217949	98
1175-04	36	41	88							88.07	100.079545	88	113.2	128.636364	110
				Methylene Chloride			1,1 Dichloroethane			cis 1,2 Dichloroethene				TCE	
8240	Sample Wt.	Dilution	% Solids	Result	Calculated	Reported	Result	Calculated	Reported	Result	Calculated	Reported	Result	Calculated	Reported
1175-05	4.97	1.006036	88	627.18	717.006585	720	8.53	9.75169197	9.8	33.18	37.9321383	38	507.29	579.945583	580

	Isopropylbenzene			Bromobenzene			n-Propylbenzene			135 TMB			2-Chlorotoluene		
	Maxima	Calculated	Reported	Maxima	Calculated	Reported	Maxima	Calculated	Reported	Maxima	Calculated	Reported	Maxima	Calculated	Reported
1204-03	2.55	3.072289	3.1	6.69	8.06024096	8.1	2.6	3.13253012	3.2	1.12	1.34939759	1.4	4.06	4.89156627	4.9
	t-Butylbenzene			124 TMB			s-Butylbenzene			p-Isopropyltoluene					
	Maxima	Calculated	Reported	Maxima	Calculated	Reported	Maxima	Calculated	Reported	Maxima	Calculated	Reported			
	7	8.433735	8.5	5.6	6.74698795	6.8	6.67	8.03614458	8.1	3.07	3.69879518	3.7			
	n-Butylbenzene														
	Maxima	Calculated	Reported												
	3.21	3.86747	3.9												
	Naphthalene			124 TMB											
	Maxima	Calculated	Reported	Maxima	Calculated	Reported									
1204-09	1.95	2.321429	2.3	3.2	3.80952381	3.7									
	Methylene Chloride			Toluene											
	Maxima	Calculated	Reported	Maxima	Calculated	Reported									
1175-04	820.54	932.4318	820	1.84	2.09090909	1.8									
	Tetrachloroethene														
	Maxima	Calculated	Reported												
1219-08	7.42	8.528736	8.3												
1194-03	19.8	20.84211	25												

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/31/93

Analytical Report

Attn: Ms. Lori Bootz
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: GLO33316.A0.00

Date Received: 01/13/93
Date Reported: 01/28/93

PAL ORDER #: 9301101

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
MGWO1	01A	01/13/93
BLK-01	02A	01/13/93

Laboratory ID Number (Wisconsin DNR): 241369260

Certified By
Jeff Bushner, Linda Woodie

PRECISION ANALYTICAL LABORATORY

CLIENT: **CH2M Hill**

Sample ID: MGWO1 Lab ID: 9301101-01A Collected: 01/13/93

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
Benzene	BQL	5.0 #	ug/l	01/26/93		JAH	
Bromobenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
Bromochloromethane	BQL	5.0 #	ug/l	01/26/93		JAH	
Bromodichloromethane	BQL	5.0 #	ug/l	01/26/93		JAH	
Bromoform	BQL	15 #	ug/l	01/26/93		JAH	
Bromomethane	BQL	5.0 #	ug/l	01/26/93		JAH	
n-Butylbenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
sec-Butylbenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
tert-Butylbenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
Carbon tetrachloride	BQL	5.0 #	ug/l	01/26/93		JAH	
Chlorobenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
Chloroethane	BQL	10 #	ug/l	01/26/93		JAH	
Chloroform	BQL	5.0 #	ug/l	01/26/93		JAH	
Chloromethane	BQL	5.0 #	ug/l	01/26/93		JAH	
2-Chlorotoluene	BQL	5.0 #	ug/l	01/26/93		JAH	
4-Chlorotoluene	BQL	5.0 #	ug/l	01/26/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	25 #	ug/l	01/26/93		JAH	
Dibromochloromethane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,2-Dibromoethane	BQL	5.0 #	ug/l	01/26/93		JAH	
Dibromomethane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,2-Dichlorobenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
1,3-Dichlorobenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
1,4-Dichlorobenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
Dichlorodifluoromethane	BQL	10 #	ug/l	01/26/93		JAH	
1,1-Dichloroethane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,2-Dichloroethane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,1-Dichloroethene	BQL	5.0 #	ug/l	01/26/93		JAH	
cis-1,2-Dichloroethene	BQL	5.0 #	ug/l	01/26/93		JAH	
trans-1,2-Dichloroethene	BQL	5.0 #	ug/l	01/26/93		JAH	
1,2-Dichloropropane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,3-Dichloropropane	BQL	5.0 #	ug/l	01/26/93		JAH	
2,2-Dichloropropane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,1-Dichloropropene	BQL	5.0 #	ug/l	01/26/93		JAH	
Ethylbenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
Hexachlorobutadiene	BQL	5.0 #	ug/l	01/26/93		JAH	
Isopropylbenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
p-Isopropyltoluene	BQL	5.0 #	ug/l	01/26/93		JAH	
Methylene Chloride	BQL	5.0 #	ug/l	01/26/93		JAH	
M-t-butyl-ether	BQL	5.0 #	ug/l	01/26/93		JAH	
Naphthalene	BQL	5.0 #	ug/l	01/26/93		JAH	
n-Propylbenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
Styrene	BQL	5.0 #	ug/l	01/26/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	5.0 #	ug/l	01/26/93		JAH	
Tetrachloroethene	BQL	5.0 #	ug/l	01/26/93		JAH	
Toluene	BQL	5.0 #	ug/l	01/26/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
1,2,3-Trichlorobenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
1,2,4-Trichlorobenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
1,1,1-Trichloroethane	30	5.0 #	ug/l	01/26/93		JAH	
1,1,2-Trichloroethane	BQL	5.0 #	ug/l	01/26/93		JAH	
Trichloroethene	310	5.0 #	ug/l	01/26/93		JAH	
Trichlorofluoromethane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,2,3-Trichloropropane	BQL	5.0 #	ug/l	01/26/93		JAH	
1,2,4-Trimethylbenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
1,3,5-Trimethylbenzene	BQL	5.0 #	ug/l	01/26/93		JAH	
Vinyl Chloride	BQL	10 #	ug/l	01/26/93		JAH	
o-Xylene	BQL	5.0 #	ug/l	01/26/93		JAH	
m/p-Xylene	BQL	5.0 #	ug/l	01/26/93		JAH	
Alkalinity	730	5.0	ppm	01/22/93		BIK	EPA 310.1
Chemical Oxygen Demand	270	5.0	mg/l	01/22/93		MHM	EPA 410.1
Iron in Water	84		mg/l	01/23/93		LJW	6010
Hardess, Total	3800		mg/l	01/23/93		LJW	EPA 130.2
Metals Digestion	-		-	01/15/93		BHZ	
Total Organic Carbon	55		mg/l	01/28/93		MJH	EPA 415.1

Sample ID: BLK-01 Lab ID: 9301101-02A Collected: 01/13/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/25/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/25/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/25/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/25/93		JAH	
Bromoform	BQL	3.0	ug/l	01/25/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/25/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/25/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/25/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/25/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/25/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/25/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/25/93		JAH	
Chloroform	BQL	1.0	ug/l	01/25/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/25/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/25/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/25/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/25/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/25/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/25/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/25/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/25/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/25/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/25/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/25/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/25/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/25/93		JAH	

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,1-Dichloroethene	BQL	1.0	ug/l	01/25/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/25/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/25/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/25/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/25/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/25/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/25/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/25/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/25/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/25/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/25/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/25/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/25/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/25/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/25/93		JAH	
Styrene	BQL	1.0	ug/l	01/25/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/25/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/25/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/25/93		JAH	
Toluene	BQL	1.0	ug/l	01/25/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/25/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/25/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/25/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/25/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/25/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/25/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/25/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/25/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/25/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/25/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/25/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/25/93		JAH	

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

03/31/93

Report Comments

CLIENT: CH2M Hill

PAL Order #: 9301101

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

Elevated detection limit due to sample concentration.

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/31/93

Analytical Report

Attn: Ms. Lori Bootz
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: MGW02

Date Received: 01/15/93
Date Reported: 02/02/93

PAL ORDER #: 9301149

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
MGW02	01A	01/15/93
BLK-02	02A	01/15/93
MGW02-FR	03A	01/15/93

Laboratory ID Number (Wisconsin DNR): 241369260

Certified By
Jeff Bushner, Linda Woodie

PRECISION ANALYTICAL LABORATORY

CLIENT: **CH2M Hill**

Sample ID: MGW02 Lab ID: 9301149-01A Collected: 01/15/93

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
Benzene	BQL	5.0 #	ug/l	01/29/93		JAH	
Bromobenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
Bromochloromethane	BQL	5.0 #	ug/l	01/29/93		JAH	
Bromodichloromethane	BQL	5.0 #	ug/l	01/29/93		JAH	
Bromoform	BQL	15 #	ug/l	01/29/93		JAH	
Bromomethane	BQL	5.0 #	ug/l	01/29/93		JAH	
n-Butylbenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
sec-Butylbenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
tert-Butylbenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
Carbon tetrachloride	BQL	5.0 #	ug/l	01/29/93		JAH	
Chlorobenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
Chloroethane	BQL	10 #	ug/l	01/29/93		JAH	
Chloroform	BQL	5.0 #	ug/l	01/29/93		JAH	
Chloromethane	BQL	5.0 #	ug/l	01/29/93		JAH	
2-Chlorotoluene	BQL	5.0 #	ug/l	01/29/93		JAH	
4-Chlorotoluene	BQL	5.0 #	ug/l	01/29/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	25 #	ug/l	01/29/93		JAH	
Dibromochloromethane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,2-Dibromoethane	BQL	5.0 #	ug/l	01/29/93		JAH	
Dibromomethane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,2-Dichlorobenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
1,3-Dichlorobenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
1,4-Dichlorobenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
Dichlorodifluoromethane	BQL	10 #	ug/l	01/29/93		JAH	
1,1-Dichloroethane	7.8	5.0 #	ug/l	01/29/93		JAH	
1,2-Dichloroethane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,1-Dichloroethene	BQL	5.0 #	ug/l	01/29/93		JAH	
cis-1,2-Dichloroethene	100	5.0 #	ug/l	01/29/93		JAH	
trans-1,2-Dichloroethene	BQL	5.0 #	ug/l	01/29/93		JAH	
1,2-Dichloropropane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,3-Dichloropropane	BQL	5.0 #	ug/l	01/29/93		JAH	
2,2-Dichloropropane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,1-Dichloropropene	BQL	5.0 #	ug/l	01/29/93		JAH	
Ethylbenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
Hexachlorobutadiene	BQL	5.0 #	ug/l	01/29/93		JAH	
Isopropylbenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
p-Isopropyltoluene	BQL	5.0 #	ug/l	01/29/93		JAH	
Methylene Chloride	BQL	5.0 #	ug/l	01/29/93		JAH	
M-t-butyl-ether	9.8	5.0 #	ug/l	01/29/93		JAH	
Naphthalene	BQL	5.0 #	ug/l	01/29/93		JAH	
n-Propylbenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
Styrene	BQL	5.0 #	ug/l	01/29/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	5.0 #	ug/l	01/29/93		JAH	
Tetrachloroethene	BQL	5.0 #	ug/l	01/29/93		JAH	
Toluene	BQL	5.0 #	ug/l	01/29/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,2,3-Trichlorobenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
1,2,4-Trichlorobenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
1,1,1-Trichloroethane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,1,2-Trichloroethane	BQL	5.0 #	ug/l	01/29/93		JAH	
Trichloroethene	280	5.0 #	ug/l	01/29/93		JAH	
Trichlorofluoromethane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,2,3-Trichloropropane	BQL	5.0 #	ug/l	01/29/93		JAH	
1,2,4-Trimethylbenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
1,3,5-Trimethylbenzene	BQL	5.0 #	ug/l	01/29/93		JAH	
Vinyl Chloride	11	10 #	ug/l	01/29/93		JAH	
o-Xylene	BQL	5.0 #	ug/l	01/29/93		JAH	
m/p-Xylene	BQL	5.0 #	ug/l	01/29/93		JAH	
Alkalinity	3400	5.0	ppm	01/22/93		BIK	EPA 310.1
Chemical Oxygen Demand	890	5.0	mg/l	01/22/93		MHM	EPA 410.1
Iron in Water	2000		mg/l	01/27/93		LJW	6010
Hardess, Total	240000		mg/l	01/27/93		LJW	EPA 130.2
Metals Digestion	-		-	01/22/93		BHZ	
Total Organic Carbon	6300		mg/l	01/31/93		MJH	EPA 415.1

Sample ID: BLK-02 Lab ID: 9301149-02A Collected: 01/15/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/26/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/26/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/26/93		JAH	
Bromoform	BQL	3.0	ug/l	01/26/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/26/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/26/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/26/93		JAH	
Chloroform	BQL	1.0	ug/l	01/26/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/26/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/26/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/26/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/26/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/26/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/26/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
1,1-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/26/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/26/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/26/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/26/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/26/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/26/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Styrene	BQL	1.0	ug/l	01/26/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/26/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/26/93		JAH	
Toluene	BQL	1.0	ug/l	01/26/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/26/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/26/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/26/93		JAH	

Sample ID: MGW02-FR Lab ID: 9301149-03A Collected: 01/15/93

8021 - Water							8021
Benzene	BQL	10	# ug/l	02/01/93		JAH	
Bromobenzene	BQL	10	# ug/l	02/01/93		JAH	
Bromochloromethane	BQL	10	# ug/l	02/01/93		JAH	
Bromodichloromethane	BQL	10	# ug/l	02/01/93		JAH	
Bromoform	BQL	30	# ug/l	02/01/93		JAH	
Bromomethane	BQL	10	# ug/l	02/01/93		JAH	
n-Butylbenzene	BQL	10	# ug/l	02/01/93		JAH	
sec-Butylbenzene	BQL	10	# ug/l	02/01/93		JAH	
tert-Butylbenzene	BQL	10	# ug/l	02/01/93		JAH	
Carbon tetrachloride	BQL	10	# ug/l	02/01/93		JAH	
Chlorobenzene	BQL	10	# ug/l	02/01/93		JAH	
Chloroethane	BQL	20	# ug/l	02/01/93		JAH	

BQL - Below Quantification Limit

CLIENT:**CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
Chloroform	BQL	10 #	ug/l	02/01/93		JAH	
Chloromethane	BQL	10 #	ug/l	02/01/93		JAH	
2-Chlorotoluene	BQL	10 #	ug/l	02/01/93		JAH	
4-Chlorotoluene	BQL	10 #	ug/l	02/01/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	50 #	ug/l	02/01/93		JAH	
Dibromochloromethane	BQL	10 #	ug/l	02/01/93		JAH	
1,2-Dibromoethane	BQL	10 #	ug/l	02/01/93		JAH	
Dibromomethane	BQL	10 #	ug/l	02/01/93		JAH	
1,2-Dichlorobenzene	BQL	10 #	ug/l	02/01/93		JAH	
1,3-Dichlorobenzene	BQL	10 #	ug/l	02/01/93		JAH	
1,4-Dichlorobenzene	BQL	10 #	ug/l	02/01/93		JAH	
Dichlorodifluoromethane	BQL	20 #	ug/l	02/01/93		JAH	
1,1-Dichloroethane	BQL	10 #	ug/l	02/01/93		JAH	
1,2-Dichloroethane	BQL	10 #	ug/l	02/01/93		JAH	
1,1-Dichloroethene	BQL	10 #	ug/l	02/01/93		JAH	
cis-1,2-Dichloroethene	62	10 #	ug/l	02/01/93		JAH	
trans-1,2-Dichloroethene	BQL	10 #	ug/l	02/01/93		JAH	
1,2-Dichloropropane	BQL	10 #	ug/l	02/01/93		JAH	
1,3-Dichloropropane	BQL	10 #	ug/l	02/01/93		JAH	
2,2-Dichloropropane	BQL	10 #	ug/l	02/01/93		JAH	
1,1-Dichloropropene	BQL	10 #	ug/l	02/01/93		JAH	
Ethylbenzene	BQL	10 #	ug/l	02/01/93		JAH	
Hexachlorobutadiene	BQL	10 #	ug/l	02/01/93		JAH	
Isopropylbenzene	BQL	10 #	ug/l	02/01/93		JAH	
p-Isopropyltoluene	BQL	10 #	ug/l	02/01/93		JAH	
Methylene Chloride	BQL	10 #	ug/l	02/01/93		JAH	
M-t-butyl-ether	BQL	10 #	ug/l	02/01/93		JAH	
Naphthalene	BQL	10 #	ug/l	02/01/93		JAH	
n-Propylbenzene	BQL	10 #	ug/l	02/01/93		JAH	
Styrene	BQL	10 #	ug/l	02/01/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	10 #	ug/l	02/01/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	10 #	ug/l	02/01/93		JAH	
Tetrachloroethene	BQL	10 #	ug/l	02/01/93		JAH	
Toluene	BQL	10 #	ug/l	02/01/93		JAH	
1,2,3-Trichlorobenzene	BQL	10 #	ug/l	02/01/93		JAH	
1,2,4-Trichlorobenzene	BQL	10 #	ug/l	02/01/93		JAH	
1,1,1-Trichloroethane	BQL	10 #	ug/l	02/01/93		JAH	
1,1,2-Trichloroethane	BQL	10 #	ug/l	02/01/93		JAH	
Trichloroethene	230	10 #	ug/l	02/01/93		JAH	
Trichlorofluoromethane	BQL	10 #	ug/l	02/01/93		JAH	
1,2,3-Trichloropropane	BQL	10 #	ug/l	02/01/93		JAH	
1,2,4-Trimethylbenzene	BQL	10 #	ug/l	02/01/93		JAH	
1,3,5-Trimethylbenzene	BQL	10 #	ug/l	02/01/93		JAH	
Vinyl Chloride	BQL	20 #	ug/l	02/01/93		JAH	
o-Xylene	BQL	10 #	ug/l	02/01/93		JAH	
m/p-Xylene	BQL	10 #	ug/l	02/01/93		JAH	
Alkalinity	4200	5.0	ppm	01/22/93		BIK	EPA 310.1
Chemical Oxygen Demand	1100	5.0	mg/l	01/22/93		MHM	EPA 410.1
Iron in Water	2400		mg/l	01/27/93		LJW	6010
Hardess, Total	230000		mg/l	01/27/93		LJW	EPA 130.2

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
Metals Digestion	-		-	01/22/93		BHZ	
Total Organic Carbon	4500		mg/l	01/31/93		MJH	EPA 415.1

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

03/31/93

Report Comments

CLIENT: CH2M Hill

PAL Order #: 9301149

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

The samples submitted for Iron and Hardness preserved with Nitric Acid were received at pH 6-7. The samples were treated with additional 1:1 Nitric Acid (10 mL) but the pH was not altered. Additional acid was not added since the volume of acid needed would significantly change the concentrations.

The samples submitted for COD and TOC preserved with Sulfuric Acid were received at pH 6-7. The samples were treated with additional 1:1 Sulfuric Acid (10ml) but the pH was not altered. Additional acid was not added since the volume of acid needed would significantly change the concentrations.

Sample was covered air tight in approved container, shipped in cooler from the source to our lab, temperature upon arrival was 4 degrees C.

Elevated detection limit due to sample concentration.

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/31/93

Analytical Report

Attn: Ms. Lori Bootz
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: Mercury Marine Plant No. 1

Date Received: 01/20/93
Date Reported: 02/09/93

PAL ORDER #: 9301175

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
MGW03	01A	01/20/93
BLK03	02A	01/20/93
MGW03-MS-MDS	03A	01/20/93
MSB8-SS-8-10	04A	01/20/93
MSB8-SS-10-12	05A	01/20/93

Laboratory ID Number (Wisconsin DNR): 241369260

Certified By
Jeff Bushner, Linda Woodie

PRECISION ANALYTICAL LABORATORY

CLIENT: **CH2M Hill**

Sample ID: MGW03 Lab ID: 9301175-01A Collected: 01/20/93

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromoform	BQL	3.0	ug/l	01/28/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/28/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/28/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/28/93		JAH	
Chloroform	BQL	1.0	ug/l	01/28/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/28/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/28/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/28/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/28/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/28/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/28/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/28/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/28/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/28/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Styrene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Toluene	BQL	1.0	ug/l	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1-Trichloroethane	8.5	1.0	ug/l	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Trichloroethene	33	1.0	ug/l	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/28/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/28/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/28/93		JAH	
Alkalinity	410	5.0	ppm	01/22/93		BIK	EPA 310.1
Chemical Oxygen Demand	23	5.0	mg/l	01/22/93		MHM	EPA 410.1
Iron in Water	28		mg/l	01/25/93		LJW	6010
Hardess, Total	1200		mg/l	01/25/93		LJW	EPA 130.2
Metals Digestion	-		-	01/25/93		BHZ	
Total Organic Carbon	5.7		mg/l	02/03/93		MJH	EPA 415.1

Sample ID: BLK03 Lab ID: 9301175-02A Collected: 01/20/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromoform	BQL	3.0	ug/l	01/28/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/28/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/28/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/28/93		JAH	
Chloroform	BQL	1.0	ug/l	01/28/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/28/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/28/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/28/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,1-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/28/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/28/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/28/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/28/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/28/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/28/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Styrene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Toluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/28/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/28/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/28/93		JAH	

Sample ID: MGW03-MS-MDS Lab ID: 9301175-03A Collected: 01/20/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromoform	BQL	3.0	ug/l	01/28/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/28/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/28/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
Chloroform	BQL	1.0	ug/l	01/28/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/28/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/28/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/28/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/28/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/28/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/28/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/28/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/28/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/28/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Styrene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Toluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1-Trichloroethane	6.1	1.0	ug/l	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Trichloroethene	28	1.0	ug/l	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/28/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/28/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/28/93		JAH	
Alkalinity	400	5.0	ppm	01/22/93		BIK	EPA 310.1
Chemical Oxygen Demand	18	5.0	mg/l	01/22/93		MHM	EPA 410.1
Iron in Water	26		mg/l	01/25/93		LJW	6010
Hardess, Total	1100		mg/l	01/25/93		LJW	EPA 130.2

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
Metals Digestion	-		-	01/25/93		BHZ	
Total Organic Carbon	3.0		mg/l	02/03/93		MJH	EPA 415.1

Sample ID: MSB8-SS-8-10 Lab ID: 9301175-04A Collected: 01/20/93

8021 - Soil						8021
Benzene	BQL	1.0	ug/kg	02/04/93	JAH	
Bromobenzene	BQL	1.0	ug/kg	02/04/93	JAH	
Bromochloromethane	BQL	1.0	ug/kg	02/04/93	JAH	
Bromodichloromethane	BQL	1.0	ug/kg	02/04/93	JAH	
Bromoform	BQL	3.0	ug/kg	02/04/93	JAH	
Bromomethane	BQL	1.0	ug/kg	02/04/93	JAH	
n-Butylbenzene	BQL	1.0	ug/kg	02/04/93	JAH	
sec-Butylbenzene	BQL	1.0	ug/kg	02/04/93	JAH	
tert-Butylbenzene	BQL	1.0	ug/kg	02/04/93	JAH	
Carbon tetrachloride	BQL	1.0	ug/kg	02/04/93	JAH	
Chlorobenzene	BQL	1.0	ug/kg	02/04/93	JAH	
Chloroethane	BQL	2.0	ug/kg	02/04/93	JAH	
Chloroform	BQL	1.0	ug/kg	02/04/93	JAH	
Chloromethane	BQL	1.0	ug/kg	02/04/93	JAH	
2-Chlorotoluene	BQL	1.0	ug/kg	02/04/93	JAH	
4-Chlorotoluene	BQL	1.0	ug/kg	02/04/93	JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/kg	02/04/93	JAH	
Dibromochloromethane	BQL	1.0	ug/kg	02/04/93	JAH	
1,2-Dibromoethane	BQL	1.0	ug/kg	02/04/93	JAH	
Dibromomethane	BQL	1.0	ug/kg	02/04/93	JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/kg	02/04/93	JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/kg	02/04/93	JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/kg	02/04/93	JAH	
Dichlorodifluoromethane	BQL	2.0	ug/kg	02/04/93	JAH	
1,1-Dichloroethane	BQL	1.0	ug/kg	02/04/93	JAH	
1,2-Dichloroethane	BQL	1.0	ug/kg	02/04/93	JAH	
1,1-Dichloroethene	BQL	1.0	ug/kg	02/04/93	JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/kg	02/04/93	JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/kg	02/04/93	JAH	
1,2-Dichloropropane	BQL	1.0	ug/kg	02/04/93	JAH	
1,3-Dichloropropane	BQL	1.0	ug/kg	02/04/93	JAH	
2,2-Dichloropropane	BQL	1.0	ug/kg	02/04/93	JAH	
1,1-Dichloropropene	BQL	1.0	ug/kg	02/04/93	JAH	
Ethylbenzene	BQL	1.0	ug/kg	02/04/93	JAH	
Hexachlorobutadiene	BQL	1.0	ug/kg	02/04/93	JAH	
Isopropylbenzene	BQL	1.0	ug/kg	02/04/93	JAH	
p-Isopropyltoluene	BQL	1.0	ug/kg	02/04/93	JAH	
Methylene Chloride	* 930	1.0	ug/kg	02/04/93	JAH	
M-t-butyl-ether	BQL	1.0	ug/kg	02/04/93	JAH	
Naphthalene	BQL	1.0	ug/kg	02/04/93	JAH	
n-Propylbenzene	BQL	1.0	ug/kg	02/04/93	JAH	
Styrene	BQL	1.0	ug/kg	02/04/93	JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/kg	02/04/93	JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Soil							8021
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/kg	02/04/93		JAH	
Tetrachloroethene	BQL	1.0	ug/kg	02/04/93		JAH	
Toluene	2.1	1.0	ug/kg	02/04/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/kg	02/04/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/kg	02/04/93		JAH	
1,1,1-Trichloroethane	E 100	1.0	ug/kg	02/04/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/kg	02/04/93		JAH	
Trichloroethene	E 130	1.0	ug/kg	02/04/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/kg	02/04/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/kg	02/04/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/kg	02/04/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/kg	02/04/93		JAH	
Vinyl Chloride	BQL	2.0	ug/kg	02/04/93		JAH	
o-Xylene	BQL	1.0	ug/kg	02/04/93		JAH	
m/p-Xylene	BQL	1.0	ug/kg	02/04/93		JAH	
Dry Weight	88		%	02/05/93		JAH	
Total Organic Carbon	510 **		mg/kg	02/09/93		MJH	EPA 415.1

Sample ID: MSB8-SS-10-12 Lab ID: 9301175-05A Collected: 01/20/93

8021 - Soil							8021
Benzene	BQL	5.0	# ug/kg	02/05/93		LJS	
Bromobenzene	BQL	5.0	# ug/kg	02/05/93		LJS	
Bromochloromethane	BQL	5.0	# ug/kg	02/05/93		LJS	
Bromodichloromethane	BQL	5.0	# ug/kg	02/05/93		LJS	
Bromoform	BQL	15	# ug/kg	02/05/93		LJS	
Bromomethane	BQL	5.0	# ug/kg	02/05/93		LJS	
n-Butylbenzene	BQL	5.0	# ug/kg	02/05/93		LJS	
sec-Butylbenzene	BQL	5.0	# ug/kg	02/05/93		LJS	
tert-Butylbenzene	BQL	5.0	# ug/kg	02/05/93		LJS	
Carbon tetrachloride	BQL	5.0	# ug/kg	02/05/93		LJS	
Chlorobenzene	BQL	5.0	# ug/kg	02/05/93		LJS	
Chloroethane	BQL	10	# ug/kg	02/05/93		LJS	
Chloroform	BQL	5.0	# ug/kg	02/05/93		LJS	
Chloromethane	BQL	5.0	# ug/kg	02/05/93		LJS	
2-Chlorotoluene	BQL	5.0	# ug/kg	02/05/93		LJS	
4-Chlorotoluene	BQL	5.0	# ug/kg	02/05/93		LJS	
1,2-Dibromo-3-chloropropa	BQL	25	# ug/kg	02/05/93		LJS	
Dibromochloromethane	BQL	5.0	# ug/kg	02/05/93		LJS	
1,2-Dibromoethane	BQL	5.0	# ug/kg	02/05/93		LJS	
Dibromomethane	BQL	5.0	# ug/kg	02/05/93		LJS	
1,2-Dichlorobenzene	BQL	5.0	# ug/kg	02/05/93		LJS	
1,3-Dichlorobenzene	BQL	5.0	# ug/kg	02/05/93		LJS	
1,4-Dichlorobenzene	BQL	5.0	# ug/kg	02/05/93		LJS	
Dichlorodifluoromethane	BQL	10	# ug/kg	02/05/93		LJS	
1,1-Dichloroethane	9.8	5.0	# ug/kg	02/05/93		LJS	
1,2-Dichloroethane	BQL	5.0	# ug/kg	02/05/93		LJS	
1,1-Dichloroethene	BQL	5.0	# ug/kg	02/05/93		LJS	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
cis-1,2-Dichloroethene	38	5.0 #	ug/kg	02/05/93		LJS	
trans-1,2-Dichloroethene	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,2-Dichloropropane	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,3-Dichloropropane	BQL	5.0 #	ug/kg	02/05/93		LJS	
2,2-Dichloropropane	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,1-Dichloropropene	BQL	5.0 #	ug/kg	02/05/93		LJS	
Ethylbenzene	BQL	5.0 #	ug/kg	02/05/93		LJS	
Hexachlorobutadiene	BQL	5.0 #	ug/kg	02/05/93		LJS	
Isopropylbenzene	BQL	5.0 #	ug/kg	02/05/93		LJS	
p-Isopropyltoluene	BQL	5.0 #	ug/kg	02/05/93		LJS	
Methylene Chloride	8.9)E 720	5.0 #	ug/kg	02/05/93		LJS	
M-t-butyl-ether	BQL	5.0 #	ug/kg	02/05/93		LJS	
Naphthalene	BQL	5.0 #	ug/kg	02/05/93		LJS	
n-Propylbenzene	BQL	5.0 #	ug/kg	02/05/93		LJS	
Styrene	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,1,1,2-Tetrachloroethane	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,1,2,2-Tetrachloroethane	BQL	5.0 #	ug/kg	02/05/93		LJS	
Tetrachloroethene	BQL	5.0 #	ug/kg	02/05/93		LJS	
Toluene	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,2,3-Trichlorobenzene	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,2,4-Trichlorobenzene	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,1,1-Trichloroethane	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,1,2-Trichloroethane	BQL	5.0 #	ug/kg	02/05/93		LJS	
Trichloroethene	E 580	5.0 #	ug/kg	02/05/93		LJS	
Trichlorofluoromethane	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,2,3-Trichloropropane	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,2,4-Trimethylbenzene	BQL	5.0 #	ug/kg	02/05/93		LJS	
1,3,5-Trimethylbenzene	BQL	5.0 #	ug/kg	02/05/93		LJS	
Vinyl Chloride	BQL	10 #	ug/kg	02/05/93		LJS	
o-Xylene	BQL	5.0 #	ug/kg	02/05/93		LJS	
m/p-Xylene	BQL	5.0 #	ug/kg	02/05/93		LJS	
Dry Weight	84		%	02/04/93		JAH	
Total Organic Carbon	1200 **		mg/kg	02/09/93		MJH	EPA 415.1

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

03/31/93

Report Comments

CLIENT: CH2M Hill

PAL Order #: 9301175

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

The organic data is reported out on a dry-weight basis.

Sample was covered air tight in approved container, shipped in cooler from the source to our lab, temperature upon arrival was 4 degrees C.

This sample was run by method 8260 beyond the hold time due to a laboratory error. The elevated detection limits reflect this change in methodology.

(B) - Analyte found in the associated method blank. The value in parentheses is the blank value with the dilution factor taken into account. The actual value for the blank was 7.8 ug/l.

* The high value for methylene chloride is due to PAL contamination.

E - Estimated concentration, analyte was above the calibration range.

** Results based on one gram dry sample.

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/31/93

Analytical Report

Attn: Ms. Lori Bootz
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: Mercury Marine Plant No. 1

Date Received: 01/21/93
Date Reported: 02/09/93

PAL ORDER #: 9301194

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
BLK04	01A	01/21/93
MSB9-GW-6-11	02A	01/21/93
MSB9-GW-6-11	02B	01/21/93
MSB9-SS-9-11	03A	01/21/93
MSB9-SS-3-5	04A	01/21/93

Laboratory ID Number (Wisconsin DNR): 241369260

Certified By
Jeff Bushner, Linda Woodie

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
Sample ID: BLK04		Lab ID: 9301194-01A		Collected: 01/21/93			
8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/26/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/26/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/26/93		JAH	
Bromoform	BQL	3.0	ug/l	01/26/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/26/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/26/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/26/93		JAH	
Chloroform	BQL	1.0	ug/l	01/26/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/26/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/26/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/26/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/26/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/26/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/26/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/26/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/26/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/26/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/26/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/26/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Styrene	BQL	1.0	ug/l	01/26/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/26/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/26/93		JAH	
Toluene	BQL	1.0	ug/l	01/26/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/26/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/26/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/26/93		JAH	

Sample ID: MSB9-GW-6-11 Lab ID: 9301194-02A Collected: 01/21/93

8021 - Water							8021
Benzene	BQL	100	# ug/l	01/29/93		JAH	
Bromobenzene	BQL	100	# ug/l	01/29/93		JAH	
Bromochloromethane	BQL	100	# ug/l	01/29/93		JAH	
Bromodichloromethane	BQL	100	# ug/l	01/29/93		JAH	
Bromoform	BQL	300	# ug/l	01/29/93		JAH	
Bromomethane	BQL	100	# ug/l	01/29/93		JAH	
n-Butylbenzene	BQL	100	# ug/l	01/29/93		JAH	
sec-Butylbenzene	BQL	100	# ug/l	01/29/93		JAH	
tert-Butylbenzene	BQL	100	# ug/l	01/29/93		JAH	
Carbon tetrachloride	BQL	100	# ug/l	01/29/93		JAH	
Chlorobenzene	BQL	100	# ug/l	01/29/93		JAH	
Chloroethane	BQL	200	# ug/l	01/29/93		JAH	
Chloroform	BQL	100	# ug/l	01/29/93		JAH	
Chloromethane	BQL	100	# ug/l	01/29/93		JAH	
2-Chlorotoluene	BQL	100	# ug/l	01/29/93		JAH	
4-Chlorotoluene	BQL	100	# ug/l	01/29/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	500	# ug/l	01/29/93		JAH	
Dibromochloromethane	BQL	100	# ug/l	01/29/93		JAH	
1,2-Dibromoethane	BQL	100	# ug/l	01/29/93		JAH	
Dibromomethane	BQL	100	# ug/l	01/29/93		JAH	
1,2-Dichlorobenzene	BQL	100	# ug/l	01/29/93		JAH	
1,3-Dichlorobenzene	BQL	100	# ug/l	01/29/93		JAH	
1,4-Dichlorobenzene	BQL	100	# ug/l	01/29/93		JAH	
Dichlorodifluoromethane	BQL	200	# ug/l	01/29/93		JAH	
1,1-Dichloroethane	BQL	100	# ug/l	01/29/93		JAH	
1,2-Dichloroethane	BQL	100	# ug/l	01/29/93		JAH	
1,1-Dichloroethene	BQL	100	# ug/l	01/29/93		JAH	
cis-1,2-Dichloroethene	BQL	100	# ug/l	01/29/93		JAH	
trans-1,2-Dichloroethene	BQL	100	# ug/l	01/29/93		JAH	
1,2-Dichloropropane	BQL	100	# ug/l	01/29/93		JAH	
1,3-Dichloropropane	BQL	100	# ug/l	01/29/93		JAH	
2,2-Dichloropropane	BQL	100	# ug/l	01/29/93		JAH	

BQL - Below Quantification Limit

CLIENT:**CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
1,1-Dichloropropene	BQL	100 #	ug/l	01/29/93		JAH	
Ethylbenzene	BQL	100 #	ug/l	01/29/93		JAH	
Hexachlorobutadiene	BQL	100 #	ug/l	01/29/93		JAH	
Isopropylbenzene .	BQL	100 #	ug/l	01/29/93		JAH	
p-Isopropyltoluene	BQL	100 #	ug/l	01/29/93		JAH	
Methylene Chloride	BQL	100 #	ug/l	01/29/93		JAH	
M-t-butyl-ether	BQL	100 #	ug/l	01/29/93		JAH	
Naphthalene	BQL	100 #	ug/l	01/29/93		JAH	
n-Propylbenzene	BQL	100 #	ug/l	01/29/93		JAH	
Styrene	BQL	100 #	ug/l	01/29/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	100 #	ug/l	01/29/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	100 #	ug/l	01/29/93		JAH	
Tetrachloroethene	BQL	100 #	ug/l	01/29/93		JAH	
Toluene	BQL	100 #	ug/l	01/29/93		JAH	
1,2,3-Trichlorobenzene	BQL	100 #	ug/l	01/29/93		JAH	
1,2,4-Trichlorobenzene	BQL	100 #	ug/l	01/29/93		JAH	
1,1,1-Trichloroethane	BQL	100 #	ug/l	01/29/93		JAH	
1,1,2-Trichloroethane	BQL	100 #	ug/l	01/29/93		JAH	
Trichloroethene	2300	100 #	ug/l	01/29/93		JAH	
Trichlorofluoromethane	BQL	100 #	ug/l	01/29/93		JAH	
1,2,3-Trichloropropane	BQL	100 #	ug/l	01/29/93		JAH	
1,2,4-Trimethylbenzene	BQL	100 #	ug/l	01/29/93		JAH	
1,3,5-Trimethylbenzene	BQL	100 #	ug/l	01/29/93		JAH	
Vinyl Chloride	BQL	200 #	ug/l	01/29/93		JAH	
o-Xylene	BQL	100 #	ug/l	01/29/93		JAH	
m/p-Xylene	BQL	100 #	ug/l	01/29/93		JAH	

Sample ID: MSB9-GW-6-11 Lab ID: 9301194-02B Collected: 01/21/93

Alkalinity	2600	5.0	ppm	01/22/93	BIK	EPA 310.1
Chemical Oxygen Demand	610	5.0	mg/l	01/29/93	MHM	EPA 410.1
Iron in Water	1700		mg/l	01/28/93	LJW	6010
Hardess, Total	34000		mg/l	01/28/93	LJW	EPA 130.2
Metals Digestion	-		-	01/26/93	BHZ	
Total Organic Carbon	480		mg/l	02/02/93	MJH	EPA 415.1

Sample ID: MSB9-SS-9-11 Lab ID: 9301194-03A Collected: 01/21/93

8021 - Soil						8021
Benzene	BQL	5.2 #	ug/kg	02/04/93	JAH	
Bromobenzene	BQL	5.2 #	ug/kg	02/04/93	JAH	
Bromochloromethane	BQL	5.2 #	ug/kg	02/04/93	JAH	
Bromodichloromethane	BQL	5.2 #	ug/kg	02/04/93	JAH	
Bromoform	BQL	16 #	ug/kg	02/04/93	JAH	
Bromomethane	BQL	5.2 #	ug/kg	02/04/93	JAH	
n-Butylbenzene	BQL	5.2 #	ug/kg	02/04/93	JAH	
sec-Butylbenzene	BQL	5.2 #	ug/kg	02/04/93	JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
tert-Butylbenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Carbon tetrachloride	BQL	5.2 #	ug/kg	02/04/93		JAH	
Chlorobenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Chloroethane	BQL	10 #	ug/kg	02/04/93		JAH	
Chloroform	BQL	5.2 #	ug/kg	02/04/93		JAH	
Chloromethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
2-Chlorotoluene	BQL	5.2 #	ug/kg	02/04/93		JAH	
4-Chlorotoluene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	26 #	ug/kg	02/04/93		JAH	
Dibromochloromethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2-Dibromoethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
Dibromomethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2-Dichlorobenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,3-Dichlorobenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,4-Dichlorobenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Dichlorodifluoromethane	BQL	10 #	ug/kg	02/04/93		JAH	
1,1-Dichloroethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2-Dichloroethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,1-Dichloroethene	BQL	5.2 #	ug/kg	02/04/93		JAH	
cis-1,2-Dichloroethene	BQL	5.2 #	ug/kg	02/04/93		JAH	
trans-1,2-Dichloroethene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2-Dichloropropane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,3-Dichloropropane	BQL	5.2 #	ug/kg	02/04/93		JAH	
2,2-Dichloropropane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,1-Dichloropropene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Ethylbenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Hexachlorobutadiene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Isopropylbenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
p-Isopropyltoluene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Methylene Chloride	* 1000	5.2 #	ug/kg	02/04/93		JAH	
M-t-butyl-ether	BQL	5.2 #	ug/kg	02/04/93		JAH	
Naphthalene	BQL	5.2 #	ug/kg	02/04/93		JAH	
n-Propylbenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Styrene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
Tetrachloroethene	21	5.2 #	ug/kg	02/04/93		JAH	
Toluene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2,3-Trichlorobenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2,4-Trichlorobenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,1,1-Trichloroethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,1,2-Trichloroethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
Trichloroethene	150	5.2 #	ug/kg	02/04/93		JAH	
Trichlorofluoromethane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2,3-Trichloropropane	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,2,4-Trimethylbenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
1,3,5-Trimethylbenzene	BQL	5.2 #	ug/kg	02/04/93		JAH	
Vinyl Chloride	BQL	10 #	ug/kg	02/04/93		JAH	
o-Xylene	BQL	5.2 #	ug/kg	02/04/93		JAH	
m/p-Xylene	BQL	5.2 #	ug/kg	02/04/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
Total Organic Carbon	370**		mg/kg	02/09/93		MJH	EPA 415.1

Sample ID: MSB9-SS-3-5 Lab ID: 9301194-04A Collected: 01/21/93

8021 - Soil						8021
Benzene	BQL	1.3	ug/kg	02/03/93	JAH	
Bromobenzene	BQL	1.3	ug/kg	02/03/93	JAH	
Bromochloromethane	BQL	1.3	ug/kg	02/03/93	JAH	
Bromodichloromethane	BQL	1.3	ug/kg	02/03/93	JAH	
Bromoform	BQL	4.0	ug/kg	02/03/93	JAH	
Bromomethane	BQL	1.3	ug/kg	02/03/93	JAH	
n-Butylbenzene	BQL	1.3	ug/kg	02/03/93	JAH	
sec-Butylbenzene	BQL	1.3	ug/kg	02/03/93	JAH	
tert-Butylbenzene	BQL	1.3	ug/kg	02/03/93	JAH	
Carbon tetrachloride	BQL	1.3	ug/kg	02/03/93	JAH	
Chlorobenzene	BQL	1.3	ug/kg	02/03/93	JAH	
Chloroethane	BQL	2.6	ug/kg	02/03/93	JAH	
Chloroform	BQL	1.3	ug/kg	02/03/93	JAH	
Chloromethane	BQL	1.3	ug/kg	02/03/93	JAH	
2-Chlorotoluene	BQL	1.3	ug/kg	02/03/93	JAH	
4-Chlorotoluene	BQL	1.3	ug/kg	02/03/93	JAH	
1,2-Dibromo-3-chloropropa	BQL	6.6	ug/kg	02/03/93	JAH	
Dibromochloromethane	BQL	1.3	ug/kg	02/03/93	JAH	
1,2-Dibromoethane	BQL	1.3	ug/kg	02/03/93	JAH	
Dibromomethane	BQL	1.3	ug/kg	02/03/93	JAH	
1,2-Dichlorobenzene	BQL	1.3	ug/kg	02/03/93	JAH	
1,3-Dichlorobenzene	BQL	1.3	ug/kg	02/03/93	JAH	
1,4-Dichlorobenzene	BQL	1.3	ug/kg	02/03/93	JAH	
Dichlorodifluoromethane	BQL	2.6	ug/kg	02/03/93	JAH	
1,1-Dichloroethane	BQL	1.3	ug/kg	02/03/93	JAH	
1,2-Dichloroethane	BQL	1.3	ug/kg	02/03/93	JAH	
1,1-Dichloroethene	BQL	1.3	ug/kg	02/03/93	JAH	
cis-1,2-Dichloroethene	BQL	1.3	ug/kg	02/03/93	JAH	
trans-1,2-Dichloroethene	BQL	1.3	ug/kg	02/03/93	JAH	
1,2-Dichloropropane	BQL	1.3	ug/kg	02/03/93	JAH	
1,3-Dichloropropane	BQL	1.3	ug/kg	02/03/93	JAH	
2,2-Dichloropropane	BQL	1.3	ug/kg	02/03/93	JAH	
1,1-Dichloropropene	BQL	1.3	ug/kg	02/03/93	JAH	
Ethylbenzene	BQL	1.3	ug/kg	02/03/93	JAH	
Hexachlorobutadiene	BQL	1.3	ug/kg	02/03/93	JAH	
Isopropylbenzene	BQL	1.3	ug/kg	02/03/93	JAH	
p-Isopropyltoluene	BQL	1.3	ug/kg	02/03/93	JAH	
Methylene Chloride	BQL	1.3	ug/kg	02/03/93	JAH	
M-t-butyl-ether	BQL	1.3	ug/kg	02/03/93	JAH	
Naphthalene	BQL	1.3	ug/kg	02/03/93	JAH	
n-Propylbenzene	BQL	1.3	ug/kg	02/03/93	JAH	
Styrene	BQL	1.3	ug/kg	02/03/93	JAH	
1,1,1,2-Tetrachloroethane	BQL	1.3	ug/kg	02/03/93	JAH	
1,1,2,2-Tetrachloroethane	BQL	1.3	ug/kg	02/03/93	JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
Tetrachloroethene	BQL	1.3	ug/kg	02/03/93		JAH	
Toluene	BQL	1.3	ug/kg	02/03/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.3	ug/kg	02/03/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.3	ug/kg	02/03/93		JAH	
1,1,1-Trichloroethane	BQL	1.3	ug/kg	02/03/93		JAH	
1,1,2-Trichloroethane	BQL	1.3	ug/kg	02/03/93		JAH	
Trichloroethene	E 100	1.3	ug/kg	02/03/93		JAH	
Trichlorofluoromethane	BQL	1.3	ug/kg	02/03/93		JAH	
1,2,3-Trichloropropane	BQL	1.3	ug/kg	02/03/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.3	ug/kg	02/03/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.3	ug/kg	02/03/93		JAH	
Vinyl Chloride	BQL	2.6	ug/kg	02/03/93		JAH	
o-Xylene	BQL	1.3	ug/kg	02/03/93		JAH	
m/p-Xylene	BQL	1.3	ug/kg	02/03/93		JAH	
Total Organic Carbon	430**		mg/kg	02/09/93		MJH	EPA 415.1

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

Report Comments

03/31/93

CLIENT: CH2M Hill

PAL Order #: 9301194

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

Sample was covered air tight in approved container, shipped in cooler from the source to our lab, temperature upon arrival was 4 degrees C.

E - Estimated concentration, analyte was above the calibration range.

Elevated detection limit due to sample concentration.

* Contamination due to laboratory error.

** Results based on one gram dry sample.

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/26/93

Analytical Report

Attn: Ms. Lori Bootz
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: Mercury Marine

Date Received: 01/22/93
Date Reported: 02/11/93

PAL ORDER #: 9301204

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
BLK05	01A	01/22/93
MSB7-GW-12-15	02A	01/22/93
MSB7-SS-5-6	03A	01/22/93
MSB7-SS-6-7	04A	01/22/93
MSB7-SS-7-9	05A	01/22/93
MFB01	06A	01/22/93
MFB01	06B	01/22/93
MSB7-GW-18-28	07A	01/22/93
MSB7-GW-18-28	07B	01/22/93
MSB7-GWD-18-28	08A	01/22/93
MSB7-GWD-18-28	08B	01/22/93
MSB10-SS-1-3	09A	01/22/93
MSB10-SS-3-5	10A	01/22/93
MSB7-3-5	11A	01/22/93
MSB7-9-11	12A	01/22/93
MSB10-SS-9-11	13A	01/22/93

Laboratory ID Number (Wisconsin DNR): 241369260

HMR

Certified By
Jeff Bushner, Linda Woodie

PRECISION ANALYTICAL LABORATORY

CLIENT: **CH2M Hill**

Sample ID: BLK05 Lab ID: 9301204-01A Collected: 01/22/93

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/26/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/26/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/26/93		JAH	
Bromoform	BQL	3.0	ug/l	01/26/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/26/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/26/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/26/93		JAH	
Chloroform	BQL	1.0	ug/l	01/26/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/26/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/26/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/26/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/26/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/26/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/26/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/26/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/26/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/26/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/26/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/26/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Styrene	BQL	1.0	ug/l	01/26/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/26/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/26/93		JAH	
Toluene	BQL	1.0	ug/l	01/26/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/26/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/26/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/26/93		JAH	

Sample ID: MSB7-GW-12-15 Lab ID: 9301204-02A Collected: 01/22/93

8021 - Water							8021
Benzene	BQL	25 #	ug/l	01/26/93		JAH	
Bromobenzene	BQL	25 #	ug/l	01/26/93		JAH	
Bromochloromethane	BQL	25 #	ug/l	01/26/93		JAH	
Bromodichloromethane	BQL	25 #	ug/l	01/26/93		JAH	
Bromoform	BQL	75 #	ug/l	01/26/93		JAH	
Bromomethane	BQL	25 #	ug/l	01/26/93		JAH	
n-Butylbenzene	BQL	25 #	ug/l	01/26/93		JAH	
sec-Butylbenzene	BQL	25 #	ug/l	01/26/93		JAH	
tert-Butylbenzene	BQL	25 #	ug/l	01/26/93		JAH	
Carbon tetrachloride	BQL	25 #	ug/l	01/26/93		JAH	
Chlorobenzene	BQL	25 #	ug/l	01/26/93		JAH	
Chloroethane	BQL	50 #	ug/l	01/26/93		JAH	
Chloroform	BQL	25 #	ug/l	01/26/93		JAH	
Chloromethane	BQL	25 #	ug/l	01/26/93		JAH	
2-Chlorotoluene	BQL	25 #	ug/l	01/26/93		JAH	
4-Chlorotoluene	BQL	25 #	ug/l	01/26/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	120 #	ug/l	01/26/93		JAH	
Dibromochloromethane	BQL	25 #	ug/l	01/26/93		JAH	
1,2-Dibromoethane	BQL	25 #	ug/l	01/26/93		JAH	
Dibromomethane	BQL	25 #	ug/l	01/26/93		JAH	
1,2-Dichlorobenzene	BQL	25 #	ug/l	01/26/93		JAH	
1,3-Dichlorobenzene	BQL	25 #	ug/l	01/26/93		JAH	
1,4-Dichlorobenzene	BQL	25 #	ug/l	01/26/93		JAH	
Dichlorodifluoromethane	BQL	50 #	ug/l	01/26/93		JAH	
1,1-Dichloroethane	BQL	25 #	ug/l	01/26/93		JAH	
1,2-Dichloroethane	BQL	25 #	ug/l	01/26/93		JAH	
1,1-Dichloroethene	BQL	25 #	ug/l	01/26/93		JAH	
cis-1,2-Dichloroethene	BQL	25 #	ug/l	01/26/93		JAH	
trans-1,2-Dichloroethene	BQL	25 #	ug/l	01/26/93		JAH	
1,2-Dichloropropane	BQL	25 #	ug/l	01/26/93		JAH	
1,3-Dichloropropane	BQL	25 #	ug/l	01/26/93		JAH	
2,2-Dichloropropane	BQL	25 #	ug/l	01/26/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,1-Dichloropropene	BQL	25 #	ug/l	01/26/93		JAH	
Ethylbenzene	BQL	25 #	ug/l	01/26/93		JAH	
Hexachlorobutadiene	BQL	25 #	ug/l	01/26/93		JAH	
Isopropylbenzene	BQL	25 #	ug/l	01/26/93		JAH	
p-Isopropyltoluene	BQL	25 #	ug/l	01/26/93		JAH	
Methylene Chloride	BQL	25 #	ug/l	01/26/93		JAH	
M-t-butyl-ether	BQL	25 #	ug/l	01/26/93		JAH	
Naphthalene	BQL	25 #	ug/l	01/26/93		JAH	
n-Propylbenzene	BQL	25 #	ug/l	01/26/93		JAH	
Styrene	BQL	25 #	ug/l	01/26/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	25 #	ug/l	01/26/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	25 #	ug/l	01/26/93		JAH	
Tetrachloroethene	BQL	25 #	ug/l	01/26/93		JAH	
Toluene	BQL	25 #	ug/l	01/26/93		JAH	
1,2,3-Trichlorobenzene	BQL	25 #	ug/l	01/26/93		JAH	
1,2,4-Trichlorobenzene	BQL	25 #	ug/l	01/26/93		JAH	
1,1,1-Trichloroethane	BQL	25 #	ug/l	01/26/93		JAH	
1,1,2-Trichloroethane	BQL	25 #	ug/l	01/26/93		JAH	
Trichloroethene	570	25 #	ug/l	01/26/93		JAH	
Trichlorofluoromethane	BQL	25 #	ug/l	01/26/93		JAH	
1,2,3-Trichloropropane	BQL	25 #	ug/l	01/26/93		JAH	
1,2,4-Trimethylbenzene	BQL	25 #	ug/l	01/26/93		JAH	
1,3,5-Trimethylbenzene	BQL	25 #	ug/l	01/26/93		JAH	
Vinyl Chloride	BQL	50 #	ug/l	01/26/93		JAH	
o-Xylene	BQL	25 #	ug/l	01/26/93		JAH	
m/p-Xylene	BQL	25 #	ug/l	01/26/93		JAH	

Sample ID: MSB7-SS-5-6 Lab ID: 9301204-03A Collected: 01/22/93

8021 - Soil							8021
Benzene	BQL	1.2	ug/kg	01/27/93		JAH	
Bromobenzene	8.1	1.2	ug/kg	01/27/93		JAH	
Bromochloromethane	BQL	1.2	ug/kg	01/27/93		JAH	
Bromodichloromethane	BQL	1.2	ug/kg	01/27/93		JAH	
Bromoform	BQL	3.7	ug/kg	01/27/93		JAH	
Bromomethane	BQL	1.2	ug/kg	01/27/93		JAH	
n-Butylbenzene	3.9	1.2	ug/kg	01/27/93		JAH	
sec-Butylbenzene	8.0	1.2	ug/kg	01/27/93		JAH	
tert-Butylbenzene	8.4	1.2	ug/kg	01/27/93		JAH	
Carbon tetrachloride	BQL	1.2	ug/kg	01/27/93		JAH	
Chlorobenzene	BQL	1.2	ug/kg	01/27/93		JAH	
Chloroethane	BQL	2.4	ug/kg	01/27/93		JAH	
Chloroform	BQL	1.2	ug/kg	01/27/93		JAH	
Chloromethane	BQL	1.2	ug/kg	01/27/93		JAH	
2-Chlorotoluene	4.9	1.2	ug/kg	01/27/93		JAH	
4-Chlorotoluene	BQL	1.2	ug/kg	01/27/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	6.1	ug/kg	01/27/93		JAH	
Dibromochloromethane	BQL	1.2	ug/kg	01/27/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
1,2-Dibromoethane	BQL	1.2	ug/kg	01/27/93		JAH	
Dibromomethane	BQL	1.2	ug/kg	01/27/93		JAH	
1,2-Dichlorobenzene	BQL	1.2	ug/kg	01/27/93		JAH	
1,3-Dichlorobenzene	BQL	1.2	ug/kg	01/27/93		JAH	
1,4-Dichlorobenzene	BQL	1.2	ug/kg	01/27/93		JAH	
Dichlorodifluoromethane	BQL	2.4	ug/kg	01/27/93		JAH	
1,1-Dichloroethane	BQL	1.2	ug/kg	01/27/93		JAH	
1,2-Dichloroethane	BQL	1.2	ug/kg	01/27/93		JAH	
1,1-Dichloroethene	BQL	1.2	ug/kg	01/27/93		JAH	
cis-1,2-Dichloroethene	2.0	1.2	ug/kg	01/27/93		JAH	
trans-1,2-Dichloroethene	BQL	1.2	ug/kg	01/27/93		JAH	
1,2-Dichloropropane	BQL	1.2	ug/kg	01/27/93		JAH	
1,3-Dichloropropane	BQL	1.2	ug/kg	01/27/93		JAH	
2,2-Dichloropropane	BQL	1.2	ug/kg	01/27/93		JAH	
1,1-Dichloropropene	BQL	1.2	ug/kg	01/27/93		JAH	
Ethylbenzene	BQL	1.2	ug/kg	01/27/93		JAH	
Hexachlorobutadiene	BQL	1.2	ug/kg	01/27/93		JAH	
Isopropylbenzene	3.1	1.2	ug/kg	01/27/93		JAH	
p-Isopropyltoluene	3.7	1.2	ug/kg	01/27/93		JAH	
Methylene Chloride	BQL	1.2	ug/kg	01/27/93		JAH	
M-t-butyl-ether	BQL	1.2	ug/kg	01/27/93		JAH	
Naphthalene	BQL	1.2	ug/kg	01/27/93		JAH	
n-Propylbenzene	3.1	1.2	ug/kg	01/27/93		JAH	
Styrene	BQL	1.2	ug/kg	01/27/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.2	ug/kg	01/27/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.2	ug/kg	01/27/93		JAH	
Tetrachloroethene	BQL	1.2	ug/kg	01/27/93		JAH	
Toluene	BQL	1.2	ug/kg	01/27/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.2	ug/kg	01/27/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.2	ug/kg	01/27/93		JAH	
1,1,1-Trichloroethane	BQL	1.2	ug/kg	01/27/93		JAH	
1,1,2-Trichloroethane	BQL	1.2	ug/kg	01/27/93		JAH	
Trichloroethene	57	1.2	ug/kg	01/27/93		JAH	
Trichlorofluoromethane	BQL	1.2	ug/kg	01/27/93		JAH	
1,2,3-Trichloropropane	BQL	1.2	ug/kg	01/27/93		JAH	
1,2,4-Trimethylbenzene	6.7	1.2	ug/kg	01/27/93		JAH	
1,3,5-Trimethylbenzene	1.3	1.2	ug/kg	01/27/93		JAH	
Vinyl Chloride	BQL	2.4	ug/kg	01/27/93		JAH	
o-Xylene	BQL	1.2	ug/kg	01/27/93		JAH	
m/p-Xylene	BQL	1.2	ug/kg	01/27/93		JAH	
Total Organic Carbon	7500**		mg/kg	02/09/93		MJH	EPA 415.1

Sample ID: MSB7-SS-6-7 Lab ID: 9301204-04A Collected: 01/22/93

8021 - Soil							8021
Benzene	BQL	4.9	# ug/kg	02/01/93		JAH	
Bromobenzene	BQL	4.9	# ug/kg	02/01/93		JAH	
Bromochloromethane	BQL	4.9	# ug/kg	02/01/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Soil							8021
Bromodichloromethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
Bromoform	BQL	15 #	ug/kg	02/01/93		JAH	
Bromomethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
n-Butylbenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
sec-Butylbenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
tert-Butylbenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Carbon tetrachloride	BQL	4.9 #	ug/kg	02/01/93		JAH	
Chlorobenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Chloroethane	BQL	9.9 #	ug/kg	02/01/93		JAH	
Chloroform	BQL	4.9 #	ug/kg	02/01/93		JAH	
Chloromethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
2-Chlorotoluene	BQL	4.9 #	ug/kg	02/01/93		JAH	
4-Chlorotoluene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	25 #	ug/kg	02/01/93		JAH	
Dibromochloromethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,2-Dibromoethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
Dibromomethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,2-Dichlorobenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,3-Dichlorobenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,4-Dichlorobenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Dichlorodifluoromethane	BQL	9.9 #	ug/kg	02/01/93		JAH	
1,1-Dichloroethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,2-Dichloroethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,1-Dichloroethene	BQL	4.9 #	ug/kg	02/01/93		JAH	
cis-1,2-Dichloroethene	BQL	4.9 #	ug/kg	02/01/93		JAH	
trans-1,2-Dichloroethene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,2-Dichloropropane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,3-Dichloropropane	BQL	4.9 #	ug/kg	02/01/93		JAH	
2,2-Dichloropropane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,1-Dichloropropene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Ethylbenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Hexachlorobutadiene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Isopropylbenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
p-Isopropyltoluene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Methylene Chloride	BQL	4.9 #	ug/kg	02/01/93		JAH	
M-t-butyl-ether	BQL	4.9 #	ug/kg	02/01/93		JAH	
Naphthalene	BQL	4.9 #	ug/kg	02/01/93		JAH	
n-Propylbenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Styrene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
Tetrachloroethene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Toluene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,2,3-Trichlorobenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,2,4-Trichlorobenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,1,1-Trichloroethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,1,2-Trichloroethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
Trichloroethene	92	4.9 #	ug/kg	02/01/93		JAH	
Trichlorofluoromethane	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,2,3-Trichloropropane	BQL	4.9 #	ug/kg	02/01/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
1,2,4-Trimethylbenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
1,3,5-Trimethylbenzene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Vinyl Chloride	BQL	9.9 #	ug/kg	02/01/93		JAH	
o-Xylene	BQL	4.9 #	ug/kg	02/01/93		JAH	
m/p-Xylene	BQL	4.9 #	ug/kg	02/01/93		JAH	
Total Organic Carbon	520**		mg/kg	02/09/93		MJH	EPA 415.1
Sample ID: MSB7-SS-7-9		Lab ID:	9301204-05A	Collected: 01/22/93			
8021 - Soil							8021
Benzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Bromobenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Bromochloromethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
Bromodichloromethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
Bromoform	BQL	14 #	ug/kg	02/01/93		JAH	
Bromomethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
n-Butylbenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
sec-Butylbenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
tert-Butylbenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Carbon tetrachloride	BQL	4.8 #	ug/kg	02/01/93		JAH	
Chlorobenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Chloroethane	BQL	9.6 #	ug/kg	02/01/93		JAH	
Chloroform	BQL	4.8 #	ug/kg	02/01/93		JAH	
Chloromethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
2-Chlorotoluene	BQL	4.8 #	ug/kg	02/01/93		JAH	
4-Chlorotoluene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	24 #	ug/kg	02/01/93		JAH	
Dibromochloromethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2-Dibromoethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
Dibromomethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2-Dichlorobenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,3-Dichlorobenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,4-Dichlorobenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Dichlorodifluoromethane	BQL	9.6 #	ug/kg	02/01/93		JAH	
1,1-Dichloroethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2-Dichloroethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,1-Dichloroethene	BQL	4.8 #	ug/kg	02/01/93		JAH	
cis-1,2-Dichloroethene	BQL	4.8 #	ug/kg	02/01/93		JAH	
trans-1,2-Dichloroethene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2-Dichloropropane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,3-Dichloropropane	BQL	4.8 #	ug/kg	02/01/93		JAH	
2,2-Dichloropropane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,1-Dichloropropene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Ethylbenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Hexachlorobutadiene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Isopropylbenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
p-Isopropyltoluene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Methylene Chloride	BQL	4.8 #	ug/kg	02/01/93		JAH	

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Soil							8021
M-t-butyl-ether	BQL	4.8 #	ug/kg	02/01/93		JAH	
Naphthalene	BQL	4.8 #	ug/kg	02/01/93		JAH	
n-Propylbenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Styrene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
Tetrachloroethene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Toluene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2,3-Trichlorobenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2,4-Trichlorobenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,1,1-Trichloroethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,1,2-Trichloroethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
Trichloroethene	180	4.8 #	ug/kg	02/01/93		JAH	
Trichlorofluoromethane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2,3-Trichloropropane	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,2,4-Trimethylbenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
1,3,5-Trimethylbenzene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Vinyl Chloride	BQL	9.6 #	ug/kg	02/01/93		JAH	
o-Xylene	BQL	4.8 #	ug/kg	02/01/93		JAH	
m/p-Xylene	BQL	4.8 #	ug/kg	02/01/93		JAH	
Total Organic Carbon	430**		mg/l	02/09/93		MJH	EPA 415.1

Sample ID: MFB01 Lab ID: 9301204-06A Collected: 01/22/93

Alkalinity	4.1	5.0	ppm	01/29/93		BIK	EPA 310.1
Chemical Oxygen Demand	BQL	5.0	mg/l	01/29/93		MHM	EPA 410.1
Iron in Water	0.86		mg/l	01/28/93		LJW	6010
Hardess, Total	17		mg/l	01/28/93		LJW	EPA 130.2
Metals Digestion	-		-	01/26/93		BHZ	
Total Organic Carbon	BQL	1.0	mg/l	02/09/93		MJH	EPA 415.1

Sample ID: MFB01 Lab ID: 9301204-06B Collected: 01/22/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/26/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/26/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/26/93		JAH	
Bromoform	BQL	3.0	ug/l	01/26/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/26/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/26/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/26/93		JAH	
Chloroform	BQL	1.0	ug/l	01/26/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
Chloromethane	BQL	1.0	ug/l	01/26/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/26/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/26/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/26/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/26/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/26/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/26/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/26/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/26/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/26/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/26/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Styrene	BQL	1.0	ug/l	01/26/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/26/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/26/93		JAH	
Toluene	BQL	1.0	ug/l	01/26/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/26/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/26/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/26/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/26/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/26/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/26/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/26/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/26/93		JAH	

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
Sample ID: MSB7-GW-18-28		Lab ID:	9301204-07A	Collected: 01/22/93			
Alkalinity	3600	5.0	ppm	01/29/93		BIK	EPA 310.1
Chemical Oxygen Demand	340	5.0	mg/l	01/29/93		MHM	EPA 410.1
Iron in Water	340		mg/l	01/28/93		LJW	6010
Hardess, Total	44000		mg/l	01/29/93		LJW	EPA 130.2
Metals Digestion	-		-	01/27/93		BHZ	
Total Organic Carbon	330		mg/l	02/09/93		MJH	EPA 415.1
Sample ID: MSB7-GW-18-28		Lab ID:	9301204-07B	Collected: 01/22/93			
8021 - Water							8021
Benzene	BQL	25	*# ug/l	02/05/93		LJS	
Bromobenzene	BQL	25	*# ug/l	02/05/93		LJS	
Bromochloromethane	BQL	25	*# ug/l	02/05/93		LJS	
Bromodichloromethane	BQL	25	*# ug/l	02/05/93		LJS	
Bromoform	BQL	75	*# ug/l	02/05/93		LJS	
Bromomethane	BQL	25	*# ug/l	02/05/93		LJS	
n-Butylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
sec-Butylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
tert-Butylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
Carbon tetrachloride	BQL	25	*# ug/l	02/05/93		LJS	
Chlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
Chloroethane	BQL	50	*# ug/l	02/05/93		LJS	
Chloroform	BQL	25	*# ug/l	02/05/93		LJS	
Chloromethane	BQL	25	*# ug/l	02/05/93		LJS	
2-Chlorotoluene	BQL	25	*# ug/l	02/05/93		LJS	
4-Chlorotoluene	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dibromo-3-chloropropa	BQL	120	*# ug/l	02/05/93		LJS	
Dibromochloromethane	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dibromoethane	BQL	25	*# ug/l	02/05/93		LJS	
Dibromomethane	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dichlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
1,3-Dichlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
1,4-Dichlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
Dichlorodifluoromethane	BQL	50	*# ug/l	02/05/93		LJS	
1,1-Dichloroethane	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dichloroethane	BQL	25	*# ug/l	02/05/93		LJS	
1,1-Dichloroethene	BQL	25	*# ug/l	02/05/93		LJS	
cis-1,2-Dichloroethene	BQL	25	*# ug/l	02/05/93		LJS	
trans-1,2-Dichloroethene	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dichloropropane	BQL	25	*# ug/l	02/05/93		LJS	
1,3-Dichloropropane	BQL	25	*# ug/l	02/05/93		LJS	
2,2-Dichloropropane	BQL	25	*# ug/l	02/05/93		LJS	
1,1-Dichloropropene	BQL	25	*# ug/l	02/05/93		LJS	
Ethylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
Hexachlorobutadiene	BQL	25	*# ug/l	02/05/93		LJS	
Isopropylbenzene	BQL	25	*# ug/l	02/05/93		LJS	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
p-Isopropyltoluene	BQL	25 *#	ug/l	02/05/93		LJS	
Methylene Chloride	(7.8) 35	25 *#	ug/l	02/05/93		LJS	
M-t-butyl-ether	BQL	25 *#	ug/l	02/05/93		LJS	
Naphthalene	BQL	25 *#	ug/l	02/05/93		LJS	
n-Propylbenzene	BQL	25 *#	ug/l	02/05/93		LJS	
Styrene	BQL	25 *#	ug/l	02/05/93		LJS	
1,1,1,2-Tetrachloroethane	BQL	25 *#	ug/l	02/05/93		LJS	
1,1,2,2-Tetrachloroethane	BQL	25 *#	ug/l	02/05/93		LJS	
Tetrachloroethene	BQL	25 *#	ug/l	02/05/93		LJS	
Toluene	BQL	25 *#	ug/l	02/05/93		LJS	
1,2,3-Trichlorobenzene	BQL	25 *#	ug/l	02/05/93		LJS	
1,2,4-Trichlorobenzene	BQL	25 *#	ug/l	02/05/93		LJS	
1,1,1-Trichloroethane	BQL	25 *#	ug/l	02/05/93		LJS	
1,1,2-Trichloroethane	BQL	25 *#	ug/l	02/05/93		LJS	
Trichloroethene	99	25 *#	ug/l	02/05/93		LJS	
Trichlorofluoromethane	BQL	25 *#	ug/l	02/05/93		LJS	
1,2,3-Trichloropropane	BQL	25 *#	ug/l	02/05/93		LJS	
1,2,4-Trimethylbenzene	BQL	25 *#	ug/l	02/05/93		LJS	
1,3,5-Trimethylbenzene	BQL	25 *#	ug/l	02/05/93		LJS	
Vinyl Chloride	BQL	50 *#	ug/l	02/05/93		LJS	
o-Xylene	BQL	25 *#	ug/l	02/05/93		LJS	
m/p-Xylene	BQL	25 *#	ug/l	02/05/93		LJS	

Sample ID: MSB7-GWD-18-28 Lab ID: 9301204-08A Collected: 01/22/93

Alkalinity	4800	5.0	ppm	01/29/93		BIK	EPA 310.1
Chemical Oxygen Demand	230	5.0	mg/l	01/29/93		MHM	EPA 410.1
Iron in Water	290		mg/l	01/28/93		LJW	6010
Hardess, Total	28000		mg/l	01/29/93		LJW	EPA 130.2
Metals Digestion	-		-	01/27/93		BHZ	
Total Organic Carbon	26		mg/l	02/09/93		MJH	EPA 415.1

Sample ID: MSB7-GWD-18-28 Lab ID: 9301204-08B Collected: 01/22/93

8021 - Water							8021
Benzene	BQL	25 *#	ug/l	02/05/93		LJS	
Bromobenzene	BQL	25 *#	ug/l	02/05/93		LJS	
Bromochloromethane	BQL	25 *#	ug/l	02/05/93		LJS	
Bromodichloromethane	BQL	25 *#	ug/l	02/05/93		LJS	
Bromoform	BQL	75 *#	ug/l	02/05/93		LJS	
Bromomethane	BQL	25 *#	ug/l	02/05/93		LJS	
n-Butylbenzene	BQL	25 *#	ug/l	02/05/93		LJS	
sec-Butylbenzene	BQL	25 *#	ug/l	02/05/93		LJS	
tert-Butylbenzene	BQL	25 *#	ug/l	02/05/93		LJS	
Carbon tetrachloride	BQL	25 *#	ug/l	02/05/93		LJS	
Chlorobenzene	BQL	25 *#	ug/l	02/05/93		LJS	
Chloroethane	BQL	50 *#	ug/l	02/05/93		LJS	

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
Chloroform	BQL	25	*# ug/l	02/05/93		LJS	
Chloromethane	BQL	25	*# ug/l	02/05/93		LJS	
2-Chlorotoluene	BQL	25	*# ug/l	02/05/93		LJS	
4-Chlorotoluene	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dibromo-3-chloropropa	BQL	120	*# ug/l	02/05/93		LJS	
Dibromochloromethane	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dibromoethane	BQL	25	*# ug/l	02/05/93		LJS	
Dibromomethane	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dichlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
1,3-Dichlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
1,4-Dichlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
Dichlorodifluoromethane	BQL	50	*# ug/l	02/05/93		LJS	
1,1-Dichloroethane	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dichloroethane	BQL	25	*# ug/l	02/05/93		LJS	
1,1-Dichloroethene	BQL	25	*# ug/l	02/05/93		LJS	
cis-1,2-Dichloroethene	BQL	25	*# ug/l	02/05/93		LJS	
trans-1,2-Dichloroethene	BQL	25	*# ug/l	02/05/93		LJS	
1,2-Dichloropropane	BQL	25	*# ug/l	02/05/93		LJS	
1,3-Dichloropropane	BQL	25	*# ug/l	02/05/93		LJS	
2,2-Dichloropropane	BQL	25	*# ug/l	02/05/93		LJS	
1,1-Dichloropropene	BQL	25	*# ug/l	02/05/93		LJS	
Ethylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
Hexachlorobutadiene	BQL	25	*# ug/l	02/05/93		LJS	
Isopropylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
p-Isopropyltoluene	BQL	25	*# ug/l	02/05/93		LJS	
Methylene Chloride	(7.8) 33	25	*# ug/l	02/05/93		LJS	
M-t-butyl-ether	BQL	25	*# ug/l	02/05/93		LJS	
Naphthalene	BQL	25	*# ug/l	02/05/93		LJS	
n-Propylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
Styrene	BQL	25	*# ug/l	02/05/93		LJS	
1,1,1,2-Tetrachloroethane	BQL	25	*# ug/l	02/05/93		LJS	
1,1,2,2-Tetrachloroethane	BQL	25	*# ug/l	02/05/93		LJS	
Tetrachloroethene	BQL	25	*# ug/l	02/05/93		LJS	
Toluene	BQL	25	*# ug/l	02/05/93		LJS	
1,2,3-Trichlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
1,2,4-Trichlorobenzene	BQL	25	*# ug/l	02/05/93		LJS	
1,1,1-Trichloroethane	BQL	25	*# ug/l	02/05/93		LJS	
1,1,2-Trichloroethane	BQL	25	*# ug/l	02/05/93		LJS	
Trichloroethene	100	25	*# ug/l	02/05/93		LJS	
Trichlorofluoromethane	BQL	25	*# ug/l	02/05/93		LJS	
1,2,3-Trichloropropane	BQL	25	*# ug/l	02/05/93		LJS	
1,2,4-Trimethylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
1,3,5-Trimethylbenzene	BQL	25	*# ug/l	02/05/93		LJS	
Vinyl Chloride	BQL	50	*# ug/l	02/05/93		LJS	
o-Xylene	BQL	25	*# ug/l	02/05/93		LJS	
m/p-Xylene	BQL	25	*# ug/l	02/05/93		LJS	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
Sample ID: MSB10-SS-1-3		Lab ID:	9301204-09A	Collected: 01/22/93			
8021 - Soil							8021
Benzene	BQL	1.2	ug/kg	01/29/93		JAH	
Bromobenzene	BQL	1.2	ug/kg	01/29/93		JAH	
Bromochloromethane	BQL	1.2	ug/kg	01/29/93		JAH	
Bromodichloromethane	BQL	1.2	ug/kg	01/29/93		JAH	
Bromoform	BQL	3.6	ug/kg	01/29/93		JAH	
Bromomethane	BQL	1.2	ug/kg	01/29/93		JAH	
n-Butylbenzene	BQL	1.2	ug/kg	01/29/93		JAH	
sec-Butylbenzene	BQL	1.2	ug/kg	01/29/93		JAH	
tert-Butylbenzene	BQL	1.2	ug/kg	01/29/93		JAH	
Carbon tetrachloride	BQL	1.2	ug/kg	01/29/93		JAH	
Chlorobenzene	BQL	1.2	ug/kg	01/29/93		JAH	
Chloroethane	BQL	2.4	ug/kg	01/29/93		JAH	
Chloroform	BQL	1.2	ug/kg	01/29/93		JAH	
Chloromethane	BQL	1.2	ug/kg	01/29/93		JAH	
2-Chlorotoluene	BQL	1.2	ug/kg	01/29/93		JAH	
4-Chlorotoluene	BQL	1.2	ug/kg	01/29/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	6.0	ug/kg	01/29/93		JAH	
Dibromochloromethane	BQL	1.2	ug/kg	01/29/93		JAH	
1,2-Dibromoethane	BQL	1.2	ug/kg	01/29/93		JAH	
Dibromomethane	BQL	1.2	ug/kg	01/29/93		JAH	
1,2-Dichlorobenzene	BQL	1.2	ug/kg	01/29/93		JAH	
1,3-Dichlorobenzene	BQL	1.2	ug/kg	01/29/93		JAH	
1,4-Dichlorobenzene	BQL	1.2	ug/kg	01/29/93		JAH	
Dichlorodifluoromethane	BQL	2.4	ug/kg	01/29/93		JAH	
1,1-Dichloroethane	BQL	1.2	ug/kg	01/29/93		JAH	
1,2-Dichloroethane	BQL	1.2	ug/kg	01/29/93		JAH	
1,1-Dichloroethene	BQL	1.2	ug/kg	01/29/93		JAH	
cis-1,2-Dichloroethene	BQL	1.2	ug/kg	01/29/93		JAH	
trans-1,2-Dichloroethene	BQL	1.2	ug/kg	01/29/93		JAH	
1,2-Dichloropropane	BQL	1.2	ug/kg	01/29/93		JAH	
1,3-Dichloropropane	BQL	1.2	ug/kg	01/29/93		JAH	
2,2-Dichloropropane	BQL	1.2	ug/kg	01/29/93		JAH	
1,1-Dichloropropene	BQL	1.2	ug/kg	01/29/93		JAH	
Ethylbenzene	BQL	1.2	ug/kg	01/29/93		JAH	
Hexachlorobutadiene	BQL	1.2	ug/kg	01/29/93		JAH	
Isopropylbenzene	BQL	1.2	ug/kg	01/29/93		JAH	
p-Isopropyltoluene	BQL	1.2	ug/kg	01/29/93		JAH	
Methylene Chloride	BQL	1.2	ug/kg	01/29/93		JAH	
M-t-butyl-ether	BQL	1.2	ug/kg	01/29/93		JAH	
Naphthalene	2.3	1.2	ug/kg	01/29/93		JAH	
n-Propylbenzene	BQL	1.2	ug/kg	01/29/93		JAH	
Styrene	BQL	1.2	ug/kg	01/29/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.2	ug/kg	01/29/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.2	ug/kg	01/29/93		JAH	
Tetrachloroethene	BQL	1.2	ug/kg	01/29/93		JAH	
Toluene	BQL	1.2	ug/kg	01/29/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Soil							8021
1,2,3-Trichlorobenzene	BQL	1.2	ug/kg	01/29/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.2	ug/kg	01/29/93		JAH	
1,1,1-Trichloroethane	BQL	1.2	ug/kg	01/29/93		JAH	
1,1,2-Trichloroethane	BQL	1.2	ug/kg	01/29/93		JAH	
Trichloroethene	BQL	1.2	ug/kg	01/29/93		JAH	
Trichlorofluoromethane	BQL	1.2	ug/kg	01/29/93		JAH	
1,2,3-Trichloropropane	BQL	1.2	ug/kg	01/29/93		JAH	
1,2,4-Trimethylbenzene	3.8	1.2	ug/kg	01/29/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.2	ug/kg	01/29/93		JAH	
Vinyl Chloride	BQL	2.4	ug/kg	01/29/93		JAH	
o-Xylene	BQL	1.2	ug/kg	01/29/93		JAH	
m/p-Xylene	BQL	1.2	ug/kg	01/29/93		JAH	
Total Organic Carbon	1400**		mg/kg	02/09/93		MJH	EPA 415.1

Sample ID: MSB10-SS-3-5 Lab ID: 9301204-10A Collected: 01/22/93

8021 - Soil							8021
Benzene	BQL	1.1	ug/kg	01/29/93		JAH	
Bromobenzene	BQL	1.1	ug/kg	01/29/93		JAH	
Bromochloromethane	BQL	1.1	ug/kg	01/29/93		JAH	
Bromodichloromethane	BQL	1.1	ug/kg	01/29/93		JAH	
Bromoform	BQL	3.4	ug/kg	01/29/93		JAH	
Bromomethane	BQL	1.1	ug/kg	01/29/93		JAH	
n-Butylbenzene	BQL	1.1	ug/kg	01/29/93		JAH	
sec-Butylbenzene	BQL	1.1	ug/kg	01/29/93		JAH	
tert-Butylbenzene	BQL	1.1	ug/kg	01/29/93		JAH	
Carbon tetrachloride	BQL	1.1	ug/kg	01/29/93		JAH	
Chlorobenzene	BQL	1.1	ug/kg	01/29/93		JAH	
Chloroethane	BQL	2.3	ug/kg	01/29/93		JAH	
Chloroform	BQL	1.1	ug/kg	01/29/93		JAH	
Chloromethane	BQL	1.1	ug/kg	01/29/93		JAH	
2-Chlorotoluene	BQL	1.1	ug/kg	01/29/93		JAH	
4-Chlorotoluene	BQL	1.1	ug/kg	01/29/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.6	ug/kg	01/29/93		JAH	
Dibromochloromethane	BQL	1.1	ug/kg	01/29/93		JAH	
1,2-Dibromoethane	BQL	1.1	ug/kg	01/29/93		JAH	
Dibromomethane	BQL	1.1	ug/kg	01/29/93		JAH	
1,2-Dichlorobenzene	BQL	1.1	ug/kg	01/29/93		JAH	
1,3-Dichlorobenzene	BQL	1.1	ug/kg	01/29/93		JAH	
1,4-Dichlorobenzene	BQL	1.1	ug/kg	01/29/93		JAH	
Dichlorodifluoromethane	BQL	2.3	ug/kg	01/29/93		JAH	
1,1-Dichloroethane	BQL	1.1	ug/kg	01/29/93		JAH	
1,2-Dichloroethane	BQL	1.1	ug/kg	01/29/93		JAH	
1,1-Dichloroethene	BQL	1.1	ug/kg	01/29/93		JAH	
cis-1,2-Dichloroethene	BQL	1.1	ug/kg	01/29/93		JAH	
trans-1,2-Dichloroethene	BQL	1.1	ug/kg	01/29/93		JAH	
1,2-Dichloropropane	BQL	1.1	ug/kg	01/29/93		JAH	
1,3-Dichloropropane	BQL	1.1	ug/kg	01/29/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
2,2-Dichloropropane	BQL	1.1	ug/kg	01/29/93		JAH	
1,1-Dichloropropene	BQL	1.1	ug/kg	01/29/93		JAH	
Ethylbenzene	BQL	1.1	ug/kg	01/29/93		JAH	
Hexachlorobutadiene	BQL	1.1	ug/kg	01/29/93		JAH	
Isopropylbenzene	BQL	1.1	ug/kg	01/29/93		JAH	
p-Isopropyltoluene	BQL	1.1	ug/kg	01/29/93		JAH	
Methylene Chloride	BQL	1.1	ug/kg	01/29/93		JAH	
M-t-butyl-ether	BQL	1.1	ug/kg	01/29/93		JAH	
Naphthalene	BQL	1.1	ug/kg	01/29/93		JAH	
n-Propylbenzene	BQL	1.1	ug/kg	01/29/93		JAH	
Styrene	BQL	1.1	ug/kg	01/29/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.1	ug/kg	01/29/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.1	ug/kg	01/29/93		JAH	
Tetrachloroethene	BQL	1.1	ug/kg	01/29/93		JAH	
Toluene	BQL	1.1	ug/kg	01/29/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.1	ug/kg	01/29/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.1	ug/kg	01/29/93		JAH	
1,1,1-Trichloroethane	BQL	1.1	ug/kg	01/29/93		JAH	
1,1,2-Trichloroethane	BQL	1.1	ug/kg	01/29/93		JAH	
Trichloroethene	BQL	1.1	ug/kg	01/29/93		JAH	
Trichlorofluoromethane	BQL	1.1	ug/kg	01/29/93		JAH	
1,2,3-Trichloropropane	BQL	1.1	ug/kg	01/29/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.1	ug/kg	01/29/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.1	ug/kg	01/29/93		JAH	
Vinyl Chloride	BQL	2.3	ug/kg	01/29/93		JAH	
o-Xylene	BQL	1.1	ug/kg	01/29/93		JAH	
m/p-Xylene	BQL	1.1	ug/kg	01/29/93		JAH	
Total Organic Carbon	400**		mg/kg	02/09/93		MJH	EPA 415.1

Sample ID: MSB7-3-5 Lab ID: 9301204-11A Collected: 01/22/93

Sub-Out	-	-		02/11/93		GIL	

Sample ID: MSB7-9-11 Lab ID: 9301204-12A Collected: 01/22/93

Sub-Out	-	-		02/11/93		GIL	

Sample ID: MSB10-SS-9-11 Lab ID: 9301204-13A Collected: 01/22/93

8021 - Soil							8021
Benzene	BQL	1.1	ug/kg	01/28/93		JAH	
Bromobenzene	BQL	1.1	ug/kg	01/28/93		JAH	
Bromochloromethane	BQL	1.1	ug/kg	01/28/93		JAH	
Bromodichloromethane	BQL	1.1	ug/kg	01/28/93		JAH	
Bromoform	BQL	3.2	ug/kg	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Soil							8021
Bromomethane	BQL	1.1	ug/kg	01/28/93		JAH	
n-Butylbenzene	BQL	1.1	ug/kg	01/28/93		JAH	
sec-Butylbenzene	BQL	1.1	ug/kg	01/28/93		JAH	
tert-Butylbenzene	BQL	1.1	ug/kg	01/28/93		JAH	
Carbon tetrachloride	BQL	1.1	ug/kg	01/28/93		JAH	
Chlorobenzene	BQL	1.1	ug/kg	01/28/93		JAH	
Chloroethane	BQL	2.1	ug/kg	01/28/93		JAH	
Chloroform	BQL	1.1	ug/kg	01/28/93		JAH	
Chloromethane	BQL	1.1	ug/kg	01/28/93		JAH	
2-Chlorotoluene	BQL	1.1	ug/kg	01/28/93		JAH	
4-Chlorotoluene	BQL	1.1	ug/kg	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.3	ug/kg	01/28/93		JAH	
Dibromochloromethane	BQL	1.1	ug/kg	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.1	ug/kg	01/28/93		JAH	
Dibromomethane	BQL	1.1	ug/kg	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.1	ug/kg	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.1	ug/kg	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.1	ug/kg	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.1	ug/kg	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.1	ug/kg	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.1	ug/kg	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.1	ug/kg	01/28/93		JAH	
cis-1,2-Dichloroethene	BQL	1.1	ug/kg	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.1	ug/kg	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.1	ug/kg	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.1	ug/kg	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.1	ug/kg	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.1	ug/kg	01/28/93		JAH	
Ethylbenzene	BQL	1.1	ug/kg	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.1	ug/kg	01/28/93		JAH	
Isopropylbenzene	BQL	1.1	ug/kg	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.1	ug/kg	01/28/93		JAH	
Methylene Chloride	BQL	1.1	ug/kg	01/28/93		JAH	
M-t-butyl-ether	BQL	1.1	ug/kg	01/28/93		JAH	
Naphthalene	BQL	1.1	ug/kg	01/28/93		JAH	
n-Propylbenzene	BQL	1.1	ug/kg	01/28/93		JAH	
Styrene	BQL	1.1	ug/kg	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.1	ug/kg	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.1	ug/kg	01/28/93		JAH	
Tetrachloroethene	BQL	1.1	ug/kg	01/28/93		JAH	
Toluene	BQL	1.1	ug/kg	01/28/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.1	ug/kg	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.1	ug/kg	01/28/93		JAH	
1,1,1-Trichloroethane	BQL	1.1	ug/kg	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.1	ug/kg	01/28/93		JAH	
Trichloroethene	7.5	1.1	ug/kg	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.1	ug/kg	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.1	ug/kg	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.1	ug/kg	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.1	ug/kg	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
Vinyl Chloride	BQL	2.1	ug/kg	01/28/93		JAH	
o-Xylene	BQL	1.1	ug/kg	01/28/93		JAH	
m/p-Xylene	BQL	1.1	ug/kg	01/28/93		JAH	
Total Organic Carbon	510**		mg/kg	02/09/93		MJH	EPA 415.1

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

03/26/93

Report Comments

CLIENT: CH2M Hill

PAL Order #: 9301204

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

Sample was covered air tight in approved container, shipped in cooler from the source to our lab, temperature upon arrival was 4 degrees C.

Elevated detection limit due to sample concentration.

* These samples were run by method 8260 due to hold time consideration; hence, the elevated detection limits.

(B) - Analyte found in the associated method blank. The value in parentheses is the blank value with the dilution factor taken into account. The actual value for the blank was 7.8 ug/l.

The high concentration of methylenen chloride is due to PAL contamination.

** Results based on one gram dry sample.

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/31/93

Analytical Report

Attn: Ms. Lori Bootz
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: Mercury Marine

Date Received: 01/25/93
Date Reported: 02/22/93

PAL ORDER #: 9301219

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
BLK06	01A	01/25/93
MSB10-GW-13-23	02A	01/25/93
MSB10-GW-13-23	02B	01/25/93
MSB10-GW-13-23 DUP	03A	01/25/93
MSB11-SS-1-3	04A	01/25/93
MSB11-SS-1-3	04B	01/25/93
MSB11-SSD-1-3	05A	01/25/93
MSB11-SSD-1-3	05B	01/25/93
MSB11-SS-5-7	06A	01/25/93
MSB11-SS-5-7	06B	01/25/93
MSB11-SS-9-11	07A	01/25/93
MSB11-SS-9-11	07B	01/25/93
MSB11-SS-9-11	08A	01/25/93
MSB11-SS-9-11	08B	01/25/93
MSB11-SS-13-15	09A	01/25/93
MSB11-SS-13-15	09B	01/25/93
MSB11-GW-12-15	10A	01/25/93
MSB11-GW-12-115	10B	01/25/93
MSB11-SS-3-5	11A	01/25/93

Laboratory ID Number (Wisconsin DNR): 241369260

Certified By
Jeff Bushner, Linda Woodie

PRECISION ANALYTICAL LABORATORY

CLIENT: **CH2M Hill**

Sample ID: BLK06 Lab ID: 9301219-01A Collected: 01/25/93

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromoform	BQL	3.0	ug/l	01/28/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/28/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/28/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/28/93		JAH	
Chloroform	BQL	1.0	ug/l	01/28/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/28/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/28/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/28/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/28/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/28/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/28/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/28/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/28/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/28/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Styrene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Toluene	BQL	1.0	ug/l	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/28/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/28/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/28/93		JAH	

Sample ID: MSB10-GW-13-23 Lab ID: 9301219-02A Collected: 01/25/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromoform	BQL	3.0	ug/l	01/28/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/28/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/28/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/28/93		JAH	
Chloroform	BQL	1.0	ug/l	01/28/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/28/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/28/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/28/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
1,1-Dichloropropene	BQL	1.0	ug/l	01/28/93		JAH	
Ethylbenzene	1.2	1.0	ug/l	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/28/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/28/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/28/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/28/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/28/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Styrene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Toluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/28/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/28/93		JAH	
m/p-Xylene	4.7	1.0	ug/l	01/28/93		JAH	

Sample ID: MSB10-GW-13-23 Lab ID: 9301219-02B Collected: 01/25/93

Alkalinity	400	5.0	ppm	02/03/93		BIK	EPA 310.1
Chemical Oxygen Demand	160	5.0	mg/l	01/29/93		MHM	EPA 410.1
Iron in Water	77		mg/l	01/29/93		LJW	6010
Hardess, Total	21000		mg/l	01/29/93		LJW	EPA 130.2
Metals Digestion	-		-	01/27/93		BHZ	
Total Organic Carbon	46		mg/l	02/22/93		MJH	EPA 415.1

Sample ID: MSB10-GW-13-23 DUP Lab ID: 9301219-03A Collected: 01/25/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	01/28/93		JAH	
Bromoform	BQL	3.0	ug/l	01/28/93		JAH	
Bromomethane	BQL	1.0	ug/l	01/28/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
tert-Butylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	01/28/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Chloroethane	BQL	2.0	ug/l	01/28/93		JAH	
Chloroform	BQL	1.0	ug/l	01/28/93		JAH	
Chloromethane	BQL	1.0	ug/l	01/28/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	01/28/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	01/28/93		JAH	
Dibromomethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	01/28/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	01/28/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	01/28/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	01/28/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	01/28/93		JAH	
Naphthalene	BQL	1.0	ug/l	01/28/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Styrene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Toluene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	01/28/93		JAH	
Trichloroethene	BQL	1.0	ug/l	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	01/28/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	01/28/93		JAH	
o-Xylene	BQL	1.0	ug/l	01/28/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
Sample ID: MSB11-SS-1-3		Lab ID:	9301219-04A	Collected: 01/25/93			
8021 - Soil							8021
Benzene	BQL	1.2	ug/kg	01/28/93		JAH	
Bromobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Bromochloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
Bromodichloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
Bromoform	BQL	3.7	ug/kg	01/28/93		JAH	
Bromomethane	BQL	1.2	ug/kg	01/28/93		JAH	
n-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
sec-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
tert-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Carbon tetrachloride	BQL	1.2	ug/kg	01/28/93		JAH	
Chlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Chloroethane	BQL	2.4	ug/kg	01/28/93		JAH	
Chloroform	BQL	1.2	ug/kg	01/28/93		JAH	
Chloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
2-Chlorotoluene	BQL	1.2	ug/kg	01/28/93		JAH	
4-Chlorotoluene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	6.1	ug/kg	01/28/93		JAH	
Dibromochloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.2	ug/kg	01/28/93		JAH	
Dibromomethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.4	ug/kg	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
cis-1,2-Dichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.2	ug/kg	01/28/93		JAH	
Ethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.2	ug/kg	01/28/93		JAH	
Isopropylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.2	ug/kg	01/28/93		JAH	
Methylene Chloride	BQL	1.2	ug/kg	01/28/93		JAH	
M-t-butyl-ether	BQL	1.2	ug/kg	01/28/93		JAH	
Naphthalene	BQL	1.2	ug/kg	01/28/93		JAH	
n-Propylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Styrene	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
Tetrachloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
Toluene	BQL	1.2	ug/kg	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
1,2,3-Trichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,1-Trichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
Trichloroethene	1.9	1.2	ug/kg	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Vinyl Chloride	BQL	2.4	ug/kg	01/28/93		JAH	
o-Xylene	BQL	1.2	ug/kg	01/28/93		JAH	
m/p-Xylene	BQL	1.2	ug/kg	01/28/93		JAH	
Sample ID: MSB11-SS-1-3		Lab ID:	9301219-04B		Collected: 01/25/93		
Total Organic Carbon	3900 **		mg/kg	02/09/93		MJH	EPA 415.1
Sample ID: MSB11-SSD-1-3		Lab ID:	9301219-05A		Collected: 01/25/93		
8021 - Soil							8021
Benzene	BQL	1.2	ug/kg	01/28/93		JAH	
Bromobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Bromochloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
Bromodichloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
Bromoform	BQL	3.7	ug/kg	01/28/93		JAH	
Bromomethane	BQL	1.2	ug/kg	01/28/93		JAH	
n-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
sec-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
tert-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Carbon tetrachloride	BQL	1.2	ug/kg	01/28/93		JAH	
Chlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Chloroethane	BQL	2.5	ug/kg	01/28/93		JAH	
Chloroform	BQL	1.2	ug/kg	01/28/93		JAH	
Chloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
2-Chlorotoluene	BQL	1.2	ug/kg	01/28/93		JAH	
4-Chlorotoluene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	6.2	ug/kg	01/28/93		JAH	
Dibromochloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.2	ug/kg	01/28/93		JAH	
Dibromomethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.5	ug/kg	01/28/93		JAH	
1,1-Dichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
cis-1,2-Dichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.2	ug/kg	01/28/93		JAH	
Ethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.2	ug/kg	01/28/93		JAH	
Isopropylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.2	ug/kg	01/28/93		JAH	
Methylene Chloride	BQL	1.2	ug/kg	01/28/93		JAH	
M-t-butyl-ether	BQL	1.2	ug/kg	01/28/93		JAH	
Naphthalene	BQL	1.2	ug/kg	01/28/93		JAH	
n-Propylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Styrene	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
Tetrachloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
Toluene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,1-Trichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
Trichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Vinyl Chloride	BQL	2.5	ug/kg	01/28/93		JAH	
o-Xylene	BQL	1.2	ug/kg	01/28/93		JAH	
m/p-Xylene	BQL	1.2	ug/kg	01/28/93		JAH	
Dry Weight	82		%	01/27/93		JJB	

Sample ID: MSB11-SSD-1-3 Lab ID: 9301219-05B Collected: 01/25/93

Total Organic Carbon	3200 **		mg/kg	02/09/93		MJH	EPA 415.1

Sample ID: MSB11-SS-5-7 Lab ID: 9301219-06A Collected: 01/25/93

8021 - Soil							8021
Benzene	BQL	1.2	ug/kg	01/28/93		JAH	
Bromobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Bromochloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
Bromodichloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
Bromoform	BQL	3.6	ug/kg	01/28/93		JAH	
Bromomethane	BQL	1.2	ug/kg	01/28/93		JAH	
n-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
sec-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
tert-Butylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Carbon tetrachloride	BQL	1.2	ug/kg	01/28/93		JAH	
Chlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Chloroethane	BQL	2.4	ug/kg	01/28/93		JAH	
Chloroform	BQL	1.2	ug/kg	01/28/93		JAH	
Chloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
2-Chlorotoluene	BQL	1.2	ug/kg	01/28/93		JAH	
4-Chlorotoluene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	6.0	ug/kg	01/28/93		JAH	
Dibromochloromethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dibromoethane	BQL	1.2	ug/kg	01/28/93		JAH	
Dibromomethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,3-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,4-Dichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Dichlorodifluoromethane	BQL	2.4	ug/kg	01/28/93		JAH	
1,1-Dichloroethane	4.4	1.2	ug/kg	01/28/93		JAH	
1,2-Dichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1-Dichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
cis-1,2-Dichloroethene	8.4	1.2	ug/kg	01/28/93		JAH	
trans-1,2-Dichloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,3-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
2,2-Dichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1-Dichloropropene	BQL	1.2	ug/kg	01/28/93		JAH	
Ethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Hexachlorobutadiene	BQL	1.2	ug/kg	01/28/93		JAH	
Isopropylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
p-Isopropyltoluene	BQL	1.2	ug/kg	01/28/93		JAH	
Methylene Chloride	BQL	1.2	ug/kg	01/28/93		JAH	
M-t-butyl-ether	BQL	1.2	ug/kg	01/28/93		JAH	
Naphthalene	BQL	1.2	ug/kg	01/28/93		JAH	
n-Propylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Styrene	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
Tetrachloroethene	BQL	1.2	ug/kg	01/28/93		JAH	
Toluene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,1,1-Trichloroethane	E 65	1.2	ug/kg	01/28/93		JAH	
1,1,2-Trichloroethane	BQL	1.2	ug/kg	01/28/93		JAH	
Trichloroethene	44	1.2	ug/kg	01/28/93		JAH	
Trichlorofluoromethane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,3-Trichloropropane	BQL	1.2	ug/kg	01/28/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.2	ug/kg	01/28/93		JAH	
Vinyl Chloride	BQL	2.4	ug/kg	01/28/93		JAH	
o-Xylene	BQL	1.2	ug/kg	01/28/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Soil							8021
m/p-Xylene	BQL	1.2	ug/kg	01/28/93		JAH	
Dry Weight	89		%	01/27/93		JJB	
Sample ID: MSB11-SS-5-7			Lab ID:	9301219-06B	Collected: 01/25/93		
Total Organic Carbon	380 **		mg/kg	02/09/93		MJH	EPA 415.1
Sample ID: MSB11-SS-9-11			Lab ID:	9301219-07A	Collected: 01/25/93		
8021 - Soil							8021
Benzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Bromobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Bromochloromethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
Bromodichloromethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
Bromoform	BQL	17 #	ug/kg	02/03/93		JAH	
Bromomethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
n-Butylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
sec-Butylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
tert-Butylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Carbon tetrachloride	BQL	5.7 #	ug/kg	02/03/93		JAH	
Chlorobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Chloroethane	BQL	11 #	ug/kg	02/03/93		JAH	
Chloroform	BQL	5.7 #	ug/kg	02/03/93		JAH	
Chloromethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
2-Chlorotoluene	BQL	5.7 #	ug/kg	02/03/93		JAH	
4-Chlorotoluene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	29 #	ug/kg	02/03/93		JAH	
Dibromochloromethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2-Dibromoethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
Dibromomethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2-Dichlorobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,3-Dichlorobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,4-Dichlorobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Dichlorodifluoromethane	BQL	11 #	ug/kg	02/03/93		JAH	
1,1-Dichloroethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2-Dichloroethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,1-Dichloroethene	BQL	5.7 #	ug/kg	02/03/93		JAH	
cis-1,2-Dichloroethene	20	5.7 #	ug/kg	02/03/93		JAH	
trans-1,2-Dichloroethene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2-Dichloropropane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,3-Dichloropropane	BQL	5.7 #	ug/kg	02/03/93		JAH	
2,2-Dichloropropane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,1-Dichloropropene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Ethylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Hexachlorobutadiene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Isopropylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
p-Isopropyltoluene	BQL	5.7 #	ug/kg	02/03/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
Methylene Chloride	BQL	5.7 #	ug/kg	02/03/93		JAH	
M-t-butyl-ether	BQL	5.7 #	ug/kg	02/03/93		JAH	
Naphthalene	BQL	5.7 #	ug/kg	02/03/93		JAH	
n-Propylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Styrene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
Tetrachloroethene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Toluene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2,3-Trichlorobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2,4-Trichlorobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,1,1-Trichloroethane	62	5.7 #	ug/kg	02/03/93		JAH	
1,1,2-Trichloroethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
Trichloroethene	91	5.7 #	ug/kg	02/03/93		JAH	
Trichlorofluoromethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2,3-Trichloropropane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2,4-Trimethylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,3,5-Trimethylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Vinyl Chloride	BQL	11 #	ug/kg	02/03/93		JAH	
o-Xylene	BQL	5.7 #	ug/kg	02/03/93		JAH	
m/p-Xylene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Dry Weight	93		%	01/27/93		JJB	

Sample ID: MSB11-SS-9-11 Lab ID: 9301219-07B Collected: 01/25/93

Total Organic Carbon	470 **		mg/kg	02/09/93		MJH	EPA 415.1

Sample ID: MSB11-SS-9-11 Lab ID: 9301219-08A Collected: 01/25/93

8021 - Soil							8021
Benzene	BQL	1.2	ug/kg	02/04/93		JAH	
Bromobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Bromochloromethane	BQL	1.2	ug/kg	02/04/93		JAH	
Bromodichloromethane	BQL	1.2	ug/kg	02/04/93		JAH	
Bromoform	BQL	3.6	ug/kg	02/04/93		JAH	
Bromomethane	BQL	1.2	ug/kg	02/04/93		JAH	
n-Butylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
sec-Butylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
tert-Butylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Carbon tetrachloride	BQL	1.2	ug/kg	02/04/93		JAH	
Chlorobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Chloroethane	BQL	2.4	ug/kg	02/04/93		JAH	
Chloroform	BQL	1.2	ug/kg	02/04/93		JAH	
Chloromethane	BQL	1.2	ug/kg	02/04/93		JAH	
2-Chlorotoluene	BQL	1.2	ug/kg	02/04/93		JAH	
4-Chlorotoluene	BQL	1.2	ug/kg	02/04/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.9	ug/kg	02/04/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Soil							8021
Methylene Chloride	BQL	5.7 #	ug/kg	02/03/93		JAH	
M-t-butyl-ether	BQL	5.7 #	ug/kg	02/03/93		JAH	
Naphthalene	BQL	5.7 #	ug/kg	02/03/93		JAH	
n-Propylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Styrene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
Tetrachloroethene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Toluene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2,3-Trichlorobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2,4-Trichlorobenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,1,1-Trichloroethane	62	5.7 #	ug/kg	02/03/93		JAH	
1,1,2-Trichloroethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
Trichloroethene	91	5.7 #	ug/kg	02/03/93		JAH	
Trichlorofluoromethane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2,3-Trichloropropane	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,2,4-Trimethylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
1,3,5-Trimethylbenzene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Vinyl Chloride	BQL	11 #	ug/kg	02/03/93		JAH	
o-Xylene	BQL	5.7 #	ug/kg	02/03/93		JAH	
m/p-Xylene	BQL	5.7 #	ug/kg	02/03/93		JAH	
Dry Weight	93		%	01/27/93		JJB	

Sample ID: MSB11-SS-9-11 Lab ID: 9301219-07B Collected: 01/25/93

Total Organic Carbon	470 **		mg/kg	02/09/93		MJH	EPA 415.1

Sample ID: MSB11-SS-9-11 Lab ID: 9301219-08A Collected: 01/25/93

8021 - Soil							8021
Benzene	BQL	1.2	ug/kg	02/04/93		JAH	
Bromobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Bromochloromethane	BQL	1.2	ug/kg	02/04/93		JAH	
Bromodichloromethane	BQL	1.2	ug/kg	02/04/93		JAH	
Bromoform	BQL	3.6	ug/kg	02/04/93		JAH	
Bromomethane	BQL	1.2	ug/kg	02/04/93		JAH	
n-Butylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
sec-Butylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
tert-Butylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Carbon tetrachloride	BQL	1.2	ug/kg	02/04/93		JAH	
Chlorobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Chloroethane	BQL	2.4	ug/kg	02/04/93		JAH	
Chloroform	BQL	1.2	ug/kg	02/04/93		JAH	
Chloromethane	BQL	1.2	ug/kg	02/04/93		JAH	
2-Chlorotoluene	BQL	1.2	ug/kg	02/04/93		JAH	
4-Chlorotoluene	BQL	1.2	ug/kg	02/04/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.9	ug/kg	02/04/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Soil							8021
Dibromochloromethane	BQL	1.2	ug/kg	02/04/93		JAH	
1,2-Dibromoethane	BQL	1.2	ug/kg	02/04/93		JAH	
Dibromomethane	BQL	1.2	ug/kg	02/04/93		JAH	
1,2-Dichlorobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
1,3-Dichlorobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
1,4-Dichlorobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Dichlorodifluoromethane	BQL	2.4	ug/kg	02/04/93		JAH	
1,1-Dichloroethane	9.2	1.2	ug/kg	02/04/93		JAH	
1,2-Dichloroethane	BQL	1.2	ug/kg	02/04/93		JAH	
1,1-Dichloroethene	BQL	1.2	ug/kg	02/04/93		JAH	
cis-1,2-Dichloroethene	BQL	1.2	ug/kg	02/04/93		JAH	
trans-1,2-Dichloroethene	BQL	1.2	ug/kg	02/04/93		JAH	
1,2-Dichloropropane	BQL	1.2	ug/kg	02/04/93		JAH	
1,3-Dichloropropane	BQL	1.2	ug/kg	02/04/93		JAH	
2,2-Dichloropropane	18	1.2	ug/kg	02/04/93		JAH	
1,1-Dichloropropene	BQL	1.2	ug/kg	02/04/93		JAH	
Ethylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Hexachlorobutadiene	BQL	1.2	ug/kg	02/04/93		JAH	
Isopropylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
p-Isopropyltoluene	BQL	1.2	ug/kg	02/04/93		JAH	
Methylene Chloride	* 850	1.2	ug/kg	02/04/93		JAH	
M-t-butyl-ether	BQL	1.2	ug/kg	02/04/93		JAH	
Naphthalene	BQL	1.2	ug/kg	02/04/93		JAH	
n-Propylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Styrene	BQL	1.2	ug/kg	02/04/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.2	ug/kg	02/04/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.2	ug/kg	02/04/93		JAH	
Tetrachloroethene	8.5	1.2	ug/kg	02/04/93		JAH	
Toluene	BQL	1.2	ug/kg	02/04/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.2	ug/kg	02/04/93		JAH	
1,1,1-Trichloroethane	E 103	1.2	ug/kg	02/04/93		JAH	
1,1,2-Trichloroethane	BQL	1.2	ug/kg	02/04/93		JAH	
Trichloroethene	E 69	1.2	ug/kg	02/04/93		JAH	
Trichlorofluoromethane	BQL	1.2	ug/kg	02/04/93		JAH	
1,2,3-Trichloropropane	BQL	1.2	ug/kg	02/04/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.2	ug/kg	02/04/93		JAH	
Vinyl Chloride	BQL	2.4	ug/kg	02/04/93		JAH	
o-Xylene	BQL	1.2	ug/kg	02/04/93		JAH	
m/p-Xylene	BQL	1.2	ug/kg	02/04/93		JAH	
Dry Weight	87		%	01/27/93		JJB	

Sample ID: MSB11-SS-9-11 Lab ID: 9301219-08B Collected: 01/25/93

Total Organic Carbon	320 **		mg/kg	02/09/93		MJH	EPA 415.1

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
Sample ID: MSB11-SS-13-15			Lab ID: 9301219-09A		Collected: 01/25/93		
8021 - Soil							8021
Benzene	BQL	1.1	ug/kg	02/06/93		JAH	
Bromobenzene	BQL	1.1	ug/kg	02/06/93		JAH	
Bromochloromethane	BQL	1.1	ug/kg	02/06/93		JAH	
Bromodichloromethane	BQL	1.1	ug/kg	02/06/93		JAH	
Bromoform	BQL	3.3	ug/kg	02/06/93		JAH	
Bromomethane	BQL	1.1	ug/kg	02/06/93		JAH	
n-Butylbenzene	BQL	1.1	ug/kg	02/06/93		JAH	
sec-Butylbenzene	BQL	1.1	ug/kg	02/06/93		JAH	
tert-Butylbenzene	BQL	1.1	ug/kg	02/06/93		JAH	
Carbon tetrachloride	BQL	1.1	ug/kg	02/06/93		JAH	
Chlorobenzene	BQL	1.1	ug/kg	02/06/93		JAH	
Chloroethane	BQL	2.2	ug/kg	02/06/93		JAH	
Chloroform	BQL	1.1	ug/kg	02/06/93		JAH	
Chloromethane	BQL	1.1	ug/kg	02/06/93		JAH	
2-Chlorotoluene	BQL	1.1	ug/kg	02/06/93		JAH	
4-Chlorotoluene	BQL	1.1	ug/kg	02/06/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.5	ug/kg	02/06/93		JAH	
Dibromochloromethane	BQL	1.1	ug/kg	02/06/93		JAH	
1,2-Dibromoethane	BQL	1.1	ug/kg	02/06/93		JAH	
Dibromomethane	BQL	1.1	ug/kg	02/06/93		JAH	
1,2-Dichlorobenzene	BQL	1.1	ug/kg	02/06/93		JAH	
1,3-Dichlorobenzene	BQL	1.1	ug/kg	02/06/93		JAH	
1,4-Dichlorobenzene	BQL	1.1	ug/kg	02/06/93		JAH	
Dichlorodifluoromethane	BQL	2.2	ug/kg	02/06/93		JAH	
1,1-Dichloroethane	BQL	1.1	ug/kg	02/06/93		JAH	
1,2-Dichloroethane	BQL	1.1	ug/kg	02/06/93		JAH	
1,1-Dichloroethene	BQL	1.1	ug/kg	02/06/93		JAH	
cis-1,2-Dichloroethene	BQL	1.1	ug/kg	02/06/93		JAH	
trans-1,2-Dichloroethene	BQL	1.1	ug/kg	02/06/93		JAH	
1,2-Dichloropropane	BQL	1.1	ug/kg	02/06/93		JAH	
1,3-Dichloropropane	BQL	1.1	ug/kg	02/06/93		JAH	
2,2-Dichloropropane	BQL	1.1	ug/kg	02/06/93		JAH	
1,1-Dichloropropene	BQL	1.1	ug/kg	02/06/93		JAH	
Ethylbenzene	BQL	1.1	ug/kg	02/06/93		JAH	
Hexachlorobutadiene	BQL	1.1	ug/kg	02/06/93		JAH	
Isopropylbenzene	BQL	1.1	ug/kg	02/06/93		JAH	
p-Isopropyltoluene	BQL	1.1	ug/kg	02/06/93		JAH	
Methylene Chloride	BQL	1.1	ug/kg	02/06/93		JAH	
M-t-butyl-ether	BQL	1.1	ug/kg	02/06/93		JAH	
Naphthalene	BQL	1.1	ug/kg	02/06/93		JAH	
n-Propylbenzene	BQL	1.1	ug/kg	02/06/93		JAH	
Styrene	BQL	1.1	ug/kg	02/06/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.1	ug/kg	02/06/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.1	ug/kg	02/06/93		JAH	
Tetrachloroethene	BQL	1.1	ug/kg	02/06/93		JAH	
Toluene	BQL	1.1	ug/kg	02/06/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Soil							8021
1,2,3-Trichlorobenzene	BQL	1.1	ug/kg	02/06/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.1	ug/kg	02/06/93		JAH	
1,1,1-Trichloroethane	BQL	1.1	ug/kg	02/06/93		JAH	
1,1,2-Trichloroethane	BQL	1.1	ug/kg	02/06/93		JAH	
Trichloroethene	BQL	1.1	ug/kg	02/06/93		JAH	
Trichlorofluoromethane	BQL	1.1	ug/kg	02/06/93		JAH	
1,2,3-Trichloropropane	BQL	1.1	ug/kg	02/06/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.1	ug/kg	02/06/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.1	ug/kg	02/06/93		JAH	
Vinyl Chloride	BQL	2.2	ug/kg	02/06/93		JAH	
o-Xylene	BQL	1.1	ug/kg	02/06/93		JAH	
m/p-Xylene	BQL	1.1	ug/kg	02/06/93		JAH	
Dry Weight	95		%	01/27/93		JJB	
Sample ID: MSB11-SS-13-15		Lab ID:	9301219-09B	Collected: 01/25/93			
Total Organic Carbon	8.3		% Wt	02/15/93		GLS	EPA 415.1
Sample ID: MSB11-GW-12-15		Lab ID:	9301219-10A	Collected: 01/25/93			
8021 - Water							8021
Benzene	BQL	10	ug/l	02/03/93		JAH	
Bromobenzene	BQL	10	ug/l	02/03/93		JAH	
Bromochloromethane	BQL	10	ug/l	02/03/93		JAH	
Bromodichloromethane	BQL	10	ug/l	02/03/93		JAH	
Bromoform	BQL	30	ug/l	02/03/93		JAH	
Bromomethane	BQL	10	ug/l	02/03/93		JAH	
n-Butylbenzene	BQL	10	ug/l	02/03/93		JAH	
sec-Butylbenzene	BQL	10	ug/l	02/03/93		JAH	
tert-Butylbenzene	BQL	10	ug/l	02/03/93		JAH	
Carbon tetrachloride	BQL	10	ug/l	02/03/93		JAH	
Chlorobenzene	BQL	10	ug/l	02/03/93		JAH	
Chloroethane	63	20	ug/l	02/03/93		JAH	
Chloroform	BQL	10	ug/l	02/03/93		JAH	
Chloromethane	BQL	10	ug/l	02/03/93		JAH	
2-Chlorotoluene	BQL	10	ug/l	02/03/93		JAH	
4-Chlorotoluene	BQL	10	ug/l	02/03/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	50	ug/l	02/03/93		JAH	
Dibromochloromethane	BQL	10	ug/l	02/03/93		JAH	
1,2-Dibromoethane	BQL	10	ug/l	02/03/93		JAH	
Dibromomethane	BQL	10	ug/l	02/03/93		JAH	
1,2-Dichlorobenzene	BQL	10	ug/l	02/03/93		JAH	
1,3-Dichlorobenzene	BQL	10	ug/l	02/03/93		JAH	
1,4-Dichlorobenzene	BQL	10	ug/l	02/03/93		JAH	
Dichlorodifluoromethane	BQL	20	ug/l	02/03/93		JAH	
1,1-Dichloroethane	92	10	ug/l	02/03/93		JAH	
1,2-Dichloroethane	BQL	10	ug/l	02/03/93		JAH	

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

03/31/93

Report Comments

CLIENT: CH2M Hill

PAL Order #: 9301219

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

The organic data is reported out on a dry-weight basis.

Sample was covered air tight in approved container, shipped in cooler from the source to our lab, temperature upon arrival was 4 degrees C.

E - Estimated concentration, analyte was above the calibration range.

* Contamination due to laboratory error.

** Results based on one gram dry sample.

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/31/93

Analytical Report

Attn: Ms. Lori Bootz
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: Mercury Marine

Date Received: 01/26/93
Date Reported: 02/17/93

PAL ORDER #: 9301233

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
MSB11-GW-18-28	01A	01/26/93
MSB11-GW-18-28	01B	01/26/93
BLK07	02A	01/26/93
DR1-MSB6	03A	01/26/93

Laboratory ID Number (Wisconsin DNR): 241369260

Certified By
Jeff Bushner, Linda Woodie

PRECISION ANALYTICAL LABORATORY

CLIENT: **CH2M Hill**

Sample ID: MSB11-GW-18-28 Lab ID: 9301233-01A Collected: 01/26/93

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
Benzene	BQL	5.0 #	ug/l	02/04/93		JAH	
Bromobenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
Bromochloromethane	BQL	5.0 #	ug/l	02/04/93		JAH	
Bromodichloromethane	BQL	5.0 #	ug/l	02/04/93		JAH	
Bromoform	BQL	15 #	ug/l	02/04/93		JAH	
Bromomethane	BQL	5.0 #	ug/l	02/04/93		JAH	
n-Butylbenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
sec-Butylbenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
tert-Butylbenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
Carbon tetrachloride	BQL	5.0 #	ug/l	02/04/93		JAH	
Chlorobenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
Chloroethane	39	10 #	ug/l	02/04/93		JAH	
Chloroform	BQL	5.0 #	ug/l	02/04/93		JAH	
Chloromethane	BQL	5.0 #	ug/l	02/04/93		JAH	
2-Chlorotoluene	BQL	5.0 #	ug/l	02/04/93		JAH	
4-Chlorotoluene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	25 #	ug/l	02/04/93		JAH	
Dibromochloromethane	BQL	5.0 #	ug/l	02/04/93		JAH	
1,2-Dibromoethane	BQL	5.0 #	ug/l	02/04/93		JAH	
Dibromomethane	BQL	5.0 #	ug/l	02/04/93		JAH	
1,2-Dichlorobenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,3-Dichlorobenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,4-Dichlorobenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
Dichlorodifluoromethane	BQL	10 #	ug/l	02/04/93		JAH	
1,1-Dichloroethane	92	5.0 #	ug/l	02/04/93		JAH	
1,2-Dichloroethane	BQL	5.0 #	ug/l	02/04/93		JAH	
1,1-Dichloroethene	BQL	5.0 #	ug/l	02/04/93		JAH	
cis-1,2-Dichloroethene	BQL	5.0 #	ug/l	02/04/93		JAH	
trans-1,2-Dichloroethene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,2-Dichloropropane	BQL	5.0 #	ug/l	02/04/93		JAH	
1,3-Dichloropropane	BQL	5.0 #	ug/l	02/04/93		JAH	
2,2-Dichloropropane	12	5.0 #	ug/l	02/04/93		JAH	
1,1-Dichloropropene	BQL	5.0 #	ug/l	02/04/93		JAH	
Ethylbenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
Hexachlorobutadiene	BQL	5.0 #	ug/l	02/04/93		JAH	
Isopropylbenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
p-Isopropyltoluene	BQL	5.0 #	ug/l	02/04/93		JAH	
Methylene Chloride	(8.8) 88	5.0 #	ug/l	02/04/93		JAH	
M-t-butyl-ether	BQL	5.0 #	ug/l	02/04/93		JAH	
Naphthalene	BQL	5.0 #	ug/l	02/04/93		JAH	
n-Propylbenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
Styrene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	5.0 #	ug/l	02/04/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	5.0 #	ug/l	02/04/93		JAH	
Tetrachloroethene	BQL	5.0 #	ug/l	02/04/93		JAH	
Toluene	BQL	5.0 #	ug/l	02/04/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,2,3-Trichlorobenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,2,4-Trichlorobenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,1,1-Trichloroethane	158	5.0 #	ug/l	02/04/93		JAH	
1,1,2-Trichloroethane	BQL	5.0 #	ug/l	02/04/93		JAH	
Trichloroethene	BQL	5.0 #	ug/l	02/04/93		JAH	
Trichlorofluoromethane	BQL	5.0 #	ug/l	02/04/93		JAH	
1,2,3-Trichloropropane	BQL	5.0 #	ug/l	02/04/93		JAH	
1,2,4-Trimethylbenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,3,5-Trimethylbenzene	BQL	5.0 #	ug/l	02/04/93		JAH	
Vinyl Chloride	90	10 #	ug/l	02/04/93		JAH	
o-Xylene	BQL	5.0 #	ug/l	02/04/93		JAH	
m/p-Xylene	BQL	5.0 #	ug/l	02/04/93		JAH	
Sample ID: MSB11-GW-18-28		Lab ID:	9301233-01B	Collected: 01/26/93			
Alkalinity	600	5.0	ppm	01/29/93		BIK	EPA 310.1
Chemical Oxygen Demand	58	5.0	mg/l	01/29/93		MHM	EPA 410.1
Iron in Water	490		mg/l	01/29/93		LJW	6010
Hardess, Total	9800		mg/l	01/29/93		LJW	EPA 130.2
Metals Digestion	-		-	01/28/93		BHZ	
Total Organic Carbon	20		mg/l	02/17/93		MJH	EPA 415.1
Sample ID: BLK07		Lab ID:	9301233-02A	Collected: 01/26/93			
8021 - Water							8021
Benzene	BQL	1.0	ug/l	02/03/93		JAH	
Bromobenzene	BQL	1.0	ug/l	02/03/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	02/03/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	02/03/93		JAH	
Bromoform	BQL	3.0	ug/l	02/03/93		JAH	
Bromomethane	BQL	1.0	ug/l	02/03/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	02/03/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	02/03/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	02/03/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	02/03/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	02/03/93		JAH	
Chloroethane	BQL	2.0	ug/l	02/03/93		JAH	
Chloroform	BQL	1.0	ug/l	02/03/93		JAH	
Chloromethane	BQL	1.0	ug/l	02/03/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	02/03/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	02/03/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	02/03/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	02/03/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	02/03/93		JAH	
Dibromomethane	BQL	1.0	ug/l	02/03/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	02/03/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	02/03/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
1,4-Dichlorobenzene	BQL	1.0	ug/l	02/03/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	02/03/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	02/03/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	02/03/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	02/03/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	02/03/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	02/03/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	02/03/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	02/03/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	02/03/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	02/03/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	02/03/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	02/03/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	02/03/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	02/03/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	02/03/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	02/03/93		JAH	
Naphthalene	BQL	1.0	ug/l	02/03/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	02/03/93		JAH	
Styrene	BQL	1.0	ug/l	02/03/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	02/03/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	02/03/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	02/03/93		JAH	
Toluene	BQL	1.0	ug/l	02/03/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	02/03/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	02/03/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	02/03/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	02/03/93		JAH	
Trichloroethene	BQL	1.0	ug/l	02/03/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	02/03/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	02/03/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	02/03/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	02/03/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	02/03/93		JAH	
o-Xylene	BQL	1.0	ug/l	02/03/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	02/03/93		JAH	

Sample ID: DR1-MSB6 Lab ID: 9301233-03A Collected: 01/26/93

8021 - Water							8021
Benzene	-	5.0	# ug/l	02/04/93		JAH	
Bromobenzene	-	5.0	# ug/l	02/04/93		JAH	
Bromochloromethane	-	5.0	# ug/l	02/04/93		JAH	
Bromodichloromethane	-	5.0	# ug/l	02/04/93		JAH	
Bromoform	-	15	# ug/l	02/04/93		JAH	
Bromomethane	-	5.0	# ug/l	02/04/93		JAH	
n-Butylbenzene	-	5.0	# ug/l	02/04/93		JAH	
sec-Butylbenzene	-	5.0	# ug/l	02/04/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
tert-Butylbenzene	-	5.0 #	ug/l	02/04/93		JAH	
Carbon tetrachloride	-	5.0 #	ug/l	02/04/93		JAH	
Chlorobenzene	-	5.0 #	ug/l	02/04/93		JAH	
Chloroethane	-	10 #	ug/l	02/04/93		JAH	
Chloroform	-	5.0 #	ug/l	02/04/93		JAH	
Chloromethane	-	5.0 #	ug/l	02/04/93		JAH	
2-Chlorotoluene	-	5.0 #	ug/l	02/04/93		JAH	
4-Chlorotoluene	-	5.0 #	ug/l	02/04/93		JAH	
1,2-Dibromo-3-chloropropa	-	25 #	ug/l	02/04/93		JAH	
Dibromochloromethane	-	5.0 #	ug/l	02/04/93		JAH	
1,2-Dibromoethane	-	5.0 #	ug/l	02/04/93		JAH	
Dibromomethane	-	5.0 #	ug/l	02/04/93		JAH	
1,2-Dichlorobenzene	-	5.0 #	ug/l	02/04/93		JAH	
1,3-Dichlorobenzene	-	5.0 #	ug/l	02/04/93		JAH	
1,4-Dichlorobenzene	-	5.0 #	ug/l	02/04/93		JAH	
Dichlorodifluoromethane	-	10 #	ug/l	02/04/93		JAH	
1,1-Dichloroethane	-	5.0 #	ug/l	02/04/93		JAH	
1,2-Dichloroethane	-	5.0 #	ug/l	02/04/93		JAH	
1,1-Dichloroethene	-	5.0 #	ug/l	02/04/93		JAH	
cis-1,2-Dichloroethene	BQL	5.0 #	ug/l	02/04/93		JAH	
trans-1,2-Dichloroethene	BQL	5.0 #	ug/l	02/04/93		JAH	
1,2-Dichloropropane	-	5.0 #	ug/l	02/04/93		JAH	
1,3-Dichloropropane	-	5.0 #	ug/l	02/04/93		JAH	
2,2-Dichloropropane	-	5.0 #	ug/l	02/04/93		JAH	
1,1-Dichloropropene	-	5.0 #	ug/l	02/04/93		JAH	
Ethylbenzene	-	5.0 #	ug/l	02/04/93		JAH	
Hexachlorobutadiene	-	5.0 #	ug/l	02/04/93		JAH	
Isopropylbenzene	-	5.0 #	ug/l	02/04/93		JAH	
p-Isopropyltoluene	-	5.0 #	ug/l	02/04/93		JAH	
Methylene Chloride	-	5.0 #	ug/l	02/04/93		JAH	
M-t-butyl-ether	-	5.0 #	ug/l	02/04/93		JAH	
Naphthalene	-	5.0 #	ug/l	02/04/93		JAH	
n-Propylbenzene	-	5.0 #	ug/l	02/04/93		JAH	
Styrene	-	5.0 #	ug/l	02/04/93		JAH	
1,1,1,2-Tetrachloroethane	-	5.0 #	ug/l	02/04/93		JAH	
1,1,2,2-Tetrachloroethane	-	5.0 #	ug/l	02/04/93		JAH	
Tetrachloroethene	-	5.0 #	ug/l	02/04/93		JAH	
Toluene	-	5.0 #	ug/l	02/04/93		JAH	
1,2,3-Trichlorobenzene	-	5.0 #	ug/l	02/04/93		JAH	
1,2,4-Trichlorobenzene	-	5.0 #	ug/l	02/04/93		JAH	
1,1,1-Trichloroethane	16	5.0 #	ug/l	02/04/93		JAH	
1,1,2-Trichloroethane	-	5.0 #	ug/l	02/04/93		JAH	
Trichloroethene	170	5.0 #	ug/l	02/04/93		JAH	
Trichlorofluoromethane	-	5.0 #	ug/l	02/04/93		JAH	
1,2,3-Trichloropropane	-	5.0 #	ug/l	02/04/93		JAH	
1,2,4-Trimethylbenzene	-	5.0 #	ug/l	02/04/93		JAH	
1,3,5-Trimethylbenzene	-	5.0 #	ug/l	02/04/93		JAH	
Vinyl Chloride	-	10 #	ug/l	02/04/93		JAH	
o-Xylene	-	5.0 #	ug/l	02/04/93		JAH	
m/p-Xylene	-	5.0 #	ug/l	02/04/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
Single Compound	-	-		02/04/93		JAH	

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

Report Comments

03/31/93

CLIENT: CH2M Hill

PAL Order #: 9301233

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

Sample was covered air tight in approved container, shipped in cooler from the source to our lab, temperature upon arrival was 4 degrees C.

Elevated detection limit due to sample concentration.

(B) - Analyte found in the associated method blank. The value in parentheses is the blank value with the dilution factor taken into account. The actual value for the blank was 8.8 ug/l.

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/31/93

Analytical Report

Attn: Ms. Lori Bootz
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: Mercury Marine

Date Received: 01/27/93
Date Reported: 02/17/93

PAL ORDER #: 9301245

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
MSB12-GW-14-19	01A	01/27/93
MFB02	02A	01/27/93
BLK08	03A	01/27/93

Laboratory ID Number (Wisconsin DNR): 241369260

Certified By
Jeff Bushner, Linda Woodie

PRECISION ANALYTICAL LABORATORY

CLIENT: **CH2M Hill**

Sample ID: MSB12-GW-14-19 Lab ID: 9301245-01A Collected: 01/27/93

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
Benzene	BQL	1.0	ug/l	02/06/93		JAH	
Bromobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	02/06/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	02/06/93		JAH	
Bromoform	BQL	3.0	ug/l	02/06/93		JAH	
Bromomethane	BQL	1.0	ug/l	02/06/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	02/06/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Chloroethane	BQL	2.0	ug/l	02/06/93		JAH	
Chloroform	BQL	1.0	ug/l	02/06/93		JAH	
Chloromethane	BQL	1.0	ug/l	02/06/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	02/06/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	02/06/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	02/06/93		JAH	
Dibromomethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	02/06/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	02/06/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	02/06/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	02/06/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	02/06/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	02/06/93		JAH	
Naphthalene	BQL	1.0	ug/l	02/06/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Styrene	BQL	1.0	ug/l	02/06/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	02/06/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	02/06/93		JAH	
Toluene	BQL	1.0	ug/l	02/06/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
Trichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	02/06/93		JAH	
o-Xylene	BQL	1.0	ug/l	02/06/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	02/06/93		JAH	
Alkalinity	480	5.0	ppm	01/29/93		BIK	EPA 310.1
Chemical Oxygen Demand	22	5.0	mg/l	01/29/93		MHM	EPA 410.1
Iron in Water	25		mg/l	02/01/93		LJW	6010
Hardess, Total	3100		mg/l	02/01/93		LJW	EPA 130.2
Metals Digestion	-		-	01/29/93		BHZ	
Total Organic Carbon	7.3		mg/l	02/17/93		MJH	EPA 415.1

Sample ID: MFB02 Lab ID: 9301245-02A Collected: 01/27/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	02/06/93		JAH	
Bromobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	02/06/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	02/06/93		JAH	
Bromoform	BQL	3.0	ug/l	02/06/93		JAH	
Bromomethane	BQL	1.0	ug/l	02/06/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	02/06/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Chloroethane	BQL	2.0	ug/l	02/06/93		JAH	
Chloroform	BQL	1.0	ug/l	02/06/93		JAH	
Chloromethane	BQL	1.0	ug/l	02/06/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	02/06/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	02/06/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	02/06/93		JAH	
Dibromomethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	02/06/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	02/06/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
1,1-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	02/06/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	02/06/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	02/06/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	02/06/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	02/06/93		JAH	
Naphthalene	BQL	1.0	ug/l	02/06/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Styrene	BQL	1.0	ug/l	02/06/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	02/06/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	02/06/93		JAH	
Toluene	1.0	1.0	ug/l	02/06/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
Trichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	02/06/93		JAH	
o-Xylene	BQL	1.0	ug/l	02/06/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	02/06/93		JAH	
Alkalinity	6.0	5.0	ppm	01/29/93		BIK	EPA 310.1
Chemical Oxygen Demand	5.6	5.0	mg/l	01/29/93		MHM	EPA 410.1
Iron in Water	0.15		mg/l	02/01/93		LJW	6010
Hardess, Total	8.9		mg/l	02/01/93		LJW	EPA 130.2
Metals Digestion	-		-	01/29/93		BHZ	
Total Organic Carbon	3.9		mg/l	02/17/93		MJH	EPA 415.1

Sample ID: BLK08 Lab ID: 9301245-03A Collected: 01/27/93

8021 - Water							8021
Benzene	BQL	1.0	ug/l	02/06/93		JAH	
Bromobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	02/06/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	02/06/93		JAH	
Bromoform	BQL	3.0	ug/l	02/06/93		JAH	
Bromomethane	BQL	1.0	ug/l	02/06/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
n-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	02/06/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Chloroethane	BQL	2.0	ug/l	02/06/93		JAH	
Chloroform	BQL	1.0	ug/l	02/06/93		JAH	
Chloromethane	BQL	1.0	ug/l	02/06/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	02/06/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	02/06/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	02/06/93		JAH	
Dibromomethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	02/06/93		JAH	
1,1-Dichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	02/06/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	02/06/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	02/06/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	02/06/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	02/06/93		JAH	
Naphthalene	BQL	1.0	ug/l	02/06/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Styrene	BQL	1.0	ug/l	02/06/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	02/06/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	02/06/93		JAH	
Toluene	BQL	1.0	ug/l	02/06/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	02/06/93		JAH	
Trichloroethene	BQL	1.0	ug/l	02/06/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	02/06/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	02/06/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	02/06/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	02/06/93		JAH	

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
8021 - Water							8021
o-Xylene	BQL	1.0	ug/l	02/06/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	02/06/93		JAH	

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

Report Comments

03/31/93

CLIENT: CH2M Hill

PAL Order #: 9301245

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

PRECISION ANALYTICAL LABORATORY

205 WEST GALENA
MILWAUKEE, WI 53212
(414) 272-5222

03/31/93

Analytical Report

Attn: Chris Ohland
Client: CH2M Hill
310 W. Wisconsin Ave.
Milwaukee, WI 53203

WORK ID: Mercury Marine

Date Received: 02/02/93
Date Reported: 02/19/93

PAL ORDER #: 9302040

SAMPLE DESCRIPTION	LAB ID	DATE COLLECTED
MDR2-GW	01A	02/02/93
MDR3-GW	02A	02/02/93
MDR4-GW	03A	02/02/93
MDR5-GW	04A	02/02/93
MDR6-GW	05A	02/02/93
MDR7-GW	06A	02/02/93
MDR8-GW	07A	02/02/93
MDR9-GW	08A	02/02/93
MDR10-GW	09A	02/02/93
MDR11-GW	10A	02/02/93
BLK09	11A	02/02/93
MDR1-SS	12A	02/02/93
MDR1-SS	12B	02/02/93
MDR1-SS	12C	02/02/93
MDR1-SS	12D	02/02/93

Laboratory ID Number (Wisconsin DNR): 241369260

Certified By
Jeff Bushner, Linda Woodie

PRECISION ANALYTICAL LABORATORY

CLIENT: **CH2M Hill**

Test	Result		Limit	Units	Analyzed	Extracted	BY	Method(SW846
Sample ID: MDR2-GW				Lab ID:	9302040-01A	Collected: 02/02/93		
1,1,1-Trichloroethane	BQL		1.0	ug/L	02/07/93		JAH	8240
1,2-Dichloroethylene	BQL		1.0	ug/L	02/07/93		JAH	8021
Trichloroethylene	1.4		1.0	ug/L	02/07/93		JAH	8240
Sample ID: MDR3-GW				Lab ID:	9302040-02A	Collected: 02/02/93		
1,1,1-Trichloroethane	BQL		1.0	ug/L	02/07/93		JAH	8240
1,2-Dichloroethylene	BQL		1.0	ug/L	02/07/93		JAH	8021
Trichloroethylene	E 80		1.0	ug/L	02/07/93		JAH	8240
Sample ID: MDR4-GW				Lab ID:	9302040-03A	Collected: 02/02/93		
1,1,1-Trichloroethane	10	#	5.0	ug/L	02/08/93		JAH	8240
1,2-Dichloroethylene	BQL	#	5.0	ug/L	02/08/93		JAH	8021
Trichloroethylene	200	#	5.0	ug/L	02/08/93		JAH	8240
Sample ID: MDR5-GW				Lab ID:	9302040-04A	Collected: 02/02/93		
1,1,1-Trichloroethane	BQL		1.0	ug/L	02/08/93		JAH	8240
1,2-Dichloroethylene	BQL		1.0	ug/L	02/08/93		JAH	8021
Trichloroethylene	BQL		1.0	ug/L	02/08/93		JAH	8240
Sample ID: MDR6-GW				Lab ID:	9302040-05A	Collected: 02/02/93		
1,1,1-Trichloroethane	BQL		1,0	ug/L	02/07/93		JAH	8240
1,2-Dichloroethylene	BQL		1.0	ug/L	02/07/93		JAH	8021
Trichloroethylene	BQL		1.0	ug/L	02/07/93		JAH	8240
Sample ID: MDR7-GW				Lab ID:	9302040-06A	Collected: 02/02/93		
1,1,1-Trichloroethane	BQL		1.0	ug/L	02/07/93		JAH	8240
1,2-Dichloroethylene	BQL		1.0	ug/L	02/07/93		JAH	8021
Trichloroethylene	3.8		1.0	ug/L	02/07/93		JAH	8240
Sample ID: MDR8-GW				Lab ID:	9302040-07A	Collected: 02/02/93		
1,1,1-Trichloroethane	BQL		1.0	ug/L	02/07/93		JAH	8240
1,2-Dichloroethylene	BQL		1.0	ug/L	02/07/93		JAH	8021
Trichloroethylene	6.1		1.0	ug/L	02/07/93		JAH	8240

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
Sample ID: MDR9-GW			Lab ID:	9302040-08A	Collected: 02/02/93		
1,1,1-Trichloroethane	190	# 5.0	ug/L	02/08/93		JAH	8240
1,2-Dichloroethylene	* 230	# 5.0	ug/L	02/08/93		JAH	8021
Trichloroethylene	170	# 5.0	ug/L	02/08/93		JAH	8240
Sample ID: MDR10-GW			Lab ID:	9302040-09A	Collected: 02/02/93		
1,1,1-Trichloroethane	BQL	1.0	ug/L	02/08/93		JAH	8240
1,2-Dichloroethylene	BQL	1.0	ug/L	02/08/93		JAH	8021
Trichloroethylene	BQL	1.0	ug/L	02/08/93		JAH	8240
Sample ID: MDR11-GW			Lab ID:	9302040-10A	Collected: 02/02/93		
1,1,1-Trichloroethane	BQL	1.0	ug/L	02/07/93		JAH	8240
1,2-Dichloroethylene	BQL	1.0	ug/L	02/07/93		JAH	8021
Trichloroethylene	6.3	1.0	ug/L	02/07/93		JAH	8240
Sample ID: BLK09			Lab ID:	9302040-11A	Collected: 02/02/93		
8021 - Water							8021
Benzene	BQL	1.0	ug/l	02/07/93		JAH	
Bromobenzene	BQL	1.0	ug/l	02/07/93		JAH	
Bromochloromethane	BQL	1.0	ug/l	02/07/93		JAH	
Bromodichloromethane	BQL	1.0	ug/l	02/07/93		JAH	
Bromoform	BQL	3.0	ug/l	02/07/93		JAH	
Bromomethane	BQL	1.0	ug/l	02/07/93		JAH	
n-Butylbenzene	BQL	1.0	ug/l	02/07/93		JAH	
sec-Butylbenzene	BQL	1.0	ug/l	02/07/93		JAH	
tert-Butylbenzene	BQL	1.0	ug/l	02/07/93		JAH	
Carbon tetrachloride	BQL	1.0	ug/l	02/07/93		JAH	
Chlorobenzene	BQL	1.0	ug/l	02/07/93		JAH	
Chloroethane	BQL	2.0	ug/l	02/07/93		JAH	
Chloroform	BQL	1.0	ug/l	02/07/93		JAH	
Chloromethane	BQL	1.0	ug/l	02/07/93		JAH	
2-Chlorotoluene	BQL	1.0	ug/l	02/07/93		JAH	
4-Chlorotoluene	BQL	1.0	ug/l	02/07/93		JAH	
1,2-Dibromo-3-chloropropa	BQL	5.0	ug/l	02/07/93		JAH	
Dibromochloromethane	BQL	1.0	ug/l	02/07/93		JAH	
1,2-Dibromoethane	BQL	1.0	ug/l	02/07/93		JAH	
Dibromomethane	BQL	1.0	ug/l	02/07/93		JAH	
1,2-Dichlorobenzene	BQL	1.0	ug/l	02/07/93		JAH	
1,3-Dichlorobenzene	BQL	1.0	ug/l	02/07/93		JAH	
1,4-Dichlorobenzene	BQL	1.0	ug/l	02/07/93		JAH	
Dichlorodifluoromethane	BQL	2.0	ug/l	02/07/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
8021 - Water							8021
1,1-Dichloroethane	BQL	1.0	ug/l	02/07/93		JAH	
1,2-Dichloroethane	BQL	1.0	ug/l	02/07/93		JAH	
1,1-Dichloroethene	BQL	1.0	ug/l	02/07/93		JAH	
cis-1,2-Dichloroethene	BQL	1.0	ug/l	02/07/93		JAH	
trans-1,2-Dichloroethene	BQL	1.0	ug/l	02/07/93		JAH	
1,2-Dichloropropane	BQL	1.0	ug/l	02/07/93		JAH	
1,3-Dichloropropane	BQL	1.0	ug/l	02/07/93		JAH	
2,2-Dichloropropane	BQL	1.0	ug/l	02/07/93		JAH	
1,1-Dichloropropene	BQL	1.0	ug/l	02/07/93		JAH	
Ethylbenzene	BQL	1.0	ug/l	02/07/93		JAH	
Hexachlorobutadiene	BQL	1.0	ug/l	02/07/93		JAH	
Isopropylbenzene	BQL	1.0	ug/l	02/07/93		JAH	
p-Isopropyltoluene	BQL	1.0	ug/l	02/07/93		JAH	
Methylene Chloride	BQL	1.0	ug/l	02/07/93		JAH	
M-t-butyl-ether	BQL	1.0	ug/l	02/07/93		JAH	
Naphthalene	BQL	1.0	ug/l	02/07/93		JAH	
n-Propylbenzene	BQL	1.0	ug/l	02/07/93		JAH	
Styrene	BQL	1.0	ug/l	02/07/93		JAH	
1,1,1,2-Tetrachloroethane	BQL	1.0	ug/l	02/07/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	1.0	ug/l	02/07/93		JAH	
Tetrachloroethene	BQL	1.0	ug/l	02/07/93		JAH	
Toluene	BQL	1.0	ug/l	02/07/93		JAH	
1,2,3-Trichlorobenzene	BQL	1.0	ug/l	02/07/93		JAH	
1,2,4-Trichlorobenzene	BQL	1.0	ug/l	02/07/93		JAH	
1,1,1-Trichloroethane	BQL	1.0	ug/l	02/07/93		JAH	
1,1,2-Trichloroethane	BQL	1.0	ug/l	02/07/93		JAH	
Trichloroethene	BQL	1.0	ug/l	02/07/93		JAH	
Trichlorofluoromethane	BQL	1.0	ug/l	02/07/93		JAH	
1,2,3-Trichloropropane	BQL	1.0	ug/l	02/07/93		JAH	
1,2,4-Trimethylbenzene	BQL	1.0	ug/l	02/07/93		JAH	
1,3,5-Trimethylbenzene	BQL	1.0	ug/l	02/07/93		JAH	
Vinyl Chloride	BQL	2.0	ug/l	02/07/93		JAH	
o-Xylene	BQL	1.0	ug/l	02/07/93		JAH	
m/p-Xylene	BQL	1.0	ug/l	02/07/93		JAH	

Sample ID: MDR1-SS Lab ID: 9302040-12A Collected: 02/02/93

Appearance	solid		-	02/04/93	MHM	ASTM D4979
Cyanide, Free	BQL	10	ppm	02/04/93	MHM	
Color	brown		-	02/04/93	MHM	ASTM D4979
Flash Point, Closed Cup	> 210		degrees F	02/17/93	BIK	1010
Free Liquids	0		%	02/04/93	MHM	9095
Layers	1		-	02/04/93	MHM	ASTM D4979
Odor	slight		-	02/04/93	MHM	ASTM D4979
pH	9.1		units	02/04/93	MHM	EPA 150.1
Phenol	BQL	0.5	mg/kg	02/05/93	MHM	EPA 420.1
% Chlorine	0.020		%	02/03/93	MHM	
Sulfide, Reactive	BQL	2.0	ppm	02/04/93	MHM	

BQL - Below Quantification Limit

CLIENT: CH2M Hill

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846)
Specific Gravity	2.04		-	02/04/93		MHM	ASTM D5057
Total Organic Carbon	41200		mg/kg	02/16/93		GLS	EPA 415.1
Total Organic Halogens	640		ppm	02/05/93		MHM	
Total Solids	85	1.0	%	02/09/93		BHZ	EPA 160.3
Sample ID: MDR1-SS			Lab ID:	9302040-12B	Collected: 02/02/93		
Metals Digestion (TCLP)	-		-	02/05/93		LDR	
TCLP (Silver)	BQL	0.03	mg/l	02/12/93		LJW	6010
TCLP (Arsenic)	0.90		mg/l	02/17/93		LJW	EPA 206.2
TCLP (Barium)	0.96		mg/l	02/12/93		LJW	6010
TCLP (Cadmium)	BQL	0.015	mg/l	02/12/93		LJW	6010
TCLP (Chromium)	BQL	0.02	mg/l	02/12/93		LJW	6010
TCLP (Copper)	0.04		mg/l	02/12/93		LJW	6010
TCLP (Mercury)	BQL	2.0	ppb	02/17/93		BIK	EPA 245.1
TCLP Inorganic Extraction	-		-	02/03/93		BHZ	
TCLP (Nickel)	0.07		mg/l	02/12/93		LJW	6010
TCLP (Lead)	BQL	0.2	mg/l	02/12/93		LJW	6010
TCLP (Selenium)	O.56		mg/l	02/17/93		LJW	EPA 270.2
TCLP (Zinc)	BQL	0.05	mg/l	02/12/93		LJW	6010
Sample ID: MDR1-SS			Lab ID:	9302040-12C	Collected: 02/02/93		
TCLP % Rec. (Silver)	110		%	02/08/93		LJW	6010
TCLP % Rec. (Arsenic)	97		%	02/17/93		LJW	
TCLP % Rec. (Barium)	90		%	02/08/93		LJW	6010
TCLP % Rec. (Cadmium)	91		%	02/08/93		LJW	6010
TCLP % Rec. (Chromium)	91		%	02/08/93		LJW	6010
TCLP % Rec. (Copper)	95		%	02/08/93		LJW	6010
TCLP % Rec. (Mercury)	120		%	02/17/93		BIK	
TCLP % Rec. (Nickel)	94		%	02/08/93		LJW	6010
TCLP % Rec. (Lead)	93		%	02/08/93		LJW	6010
TCLP % Rec. (Selenium)	84		%	02/17/93		LJW	
TCLP % Rec. (Zinc)	91		%	02/08/93		LJW	6010
Sample ID: MDR1-SS			Lab ID:	9302040-12D	Collected: 02/02/93		
601/602							EPA 601+602
Bromodichloromethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
Bromoform	BQL	5.0 #	ug/kg	02/08/93		JAH	
Bromomethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
Carbon Tetrachloride	BQL	5.0 #	ug/kg	02/08/93		JAH	
Chlorobenzene	BQL	5.0 #	ug/kg	02/08/93		JAH	
Chloroethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
2-Chloroethylvinyl Ether	BQL	25 #	ug/kg	02/08/93		JAH	
Chloroform	BQL	5.0 #	ug/kg	02/08/93		JAH	

BQL - Below Quantification Limit

CLIENT: **CH2M Hill**

Test	Result	Limit	Units	Analyzed	Extracted	BY	Method(SW846
601/602							EPA 601+602
Chloromethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
Dibromochloromethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
1,2-Dichlorobenzene	BQL	5.0 #	ug/kg	02/08/93		JAH	
1,3-Dichlorobenzene	BQL	5.0 #	ug/kg	02/08/93		JAH	
1,4-Dichlorobenzene	BQL	5.0 #	ug/kg	02/08/93		JAH	
Dichlorodifluoromethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
1,1-Dichloroethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
1,2-Dichloroethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
1,1-Dichloroethene	BQL	5.0 #	ug/kg	02/08/93		JAH	
trans-1,2-Dichloroethene	* 19	5.0 #	ug/kg	02/08/93		JAH	
1,2-Dichloropropane	BQL	5.0 #	ug/kg	02/08/93		JAH	
cis-1,3-Dichloropropene	BQL	5.0 #	ug/kg	02/08/93		JAH	
trans-1,3-Dichloropropene	BQL	5.0 #	ug/kg	02/08/93		JAH	
Methylene Chloride	BQL	10 #	ug/kg	02/08/93		JAH	
1,1,2,2-Tetrachloroethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
Tetrachloroethene	BQL	5.0 #	ug/kg	02/08/93		JAH	
1,1,1-Trichloroethane	59	5.0 #	ug/kg	02/08/93		JAH	
Trichloroethene	220	5.0 #	ug/kg	02/08/93		JAH	
Trichlorofluoromethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
Vinyl Chloride	BQL	5.0 #	ug/kg	02/08/93		JAH	
1,1,2-Trichloroethane	BQL	5.0 #	ug/kg	02/08/93		JAH	
Benzene	BQL	5.0 #	ug/kg	02/08/93		JAH	
Chlorobenzene	BQL	5.0 #	ug/kg	02/08/93		JAH	
Ethylbenzene	BQL	5.0 #	ug/kg	02/08/93		JAH	
Toluene	25	5.0 #	ug/kg	02/08/93		JAH	
Total Xylenes	BQL	10 #	ug/kg	02/08/93		JAH	

BQL - Below Quantification Limit

PRECISION ANALYTICAL LABORATORY

Report Comments

03/31/93

CLIENT: CH2M Hill

PAL Order #: 9302040

All analysis as per approved method found in one or more of the following:
Standard Methods for Evaluation of Water and Wastewater, 17th Edition
Methods for Chemical Analysis for Water and Wastes, Revised March 1983, EPA 600/4-79-020
Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 3rd Edition 1986 EPA SW846

Analysis performed or certified by Precision Analytical Laboratory

Sample was covered air tight in approved container, shipped in cooler from the source to our lab, temperature upon arrival was 4 degrees C.

E - Estimated concentration, analyte was above the calibration range.

The organic data is reported out on a dry-weight basis.

Elevated detection limit due to sample concentration.

* Sample contains the cis-isomer of 1,2-Dichloroethene at the stated level.

Samples 9302040-01, 03, 04, 05, 06, 07, 08, 09, 10 and 12 indicated reportable levels of toluene.

APPENDIX C
VALIDATED ANALYTICAL DATA

Parameter	Method
VOC	SW-846 Method 5030/8021
	SW-846 Method 5030/8240[a]
Alkalinity	EPA 310.1
COD	EPA 410.1
Iron	SW-846 3000/6010
Hardness	SM 2340B
TOC	EPA 415.1

[a] The laboratory was contracted to perform the test using Method 5030/8021; however, because of laboratory production problems Method 5030/8240 was used in a few instances.

The samples were sent daily by local courier to Precision Analytical Laboratory (PAL) in Milwaukee, Wisconsin (WDNR No. 241369260). Upon receipt by the laboratory the samples were checked for label identification and complete, accurate chain-of-custody records. Documentation anomalies were verified with the field sampling task manager and corrected. Each sample was assigned a unique laboratory identification number through a computerized laboratory information management system.

Upon the laboratory's acceptance of the data, the data were assembled and provided to CH2M HILL in the form of an analytical report. Each raw data package provided sufficient documentation to allow an experienced reviewer independently to reconstruct the reported results.

After receipt at CH2M HILL, the laboratory test results and raw data packages were inventoried by comparing the contents to the analyses requested, as recorded on the chain-of-custody forms. Data gaps were verified with the laboratory and the missing data were resubmitted to CH2M HILL.

Data Quality Review

Data quality review is an assessment of the laboratory data results in terms of the specific project objectives. The laboratory data were reviewed to assess whether the data were generated in accordance with the laboratory standard operating procedures (SOPs) and the scope of laboratory services submitted to the laboratory. The data package was reviewed to ensure that the following conditions were met.

- Sample preparation information was correct and complete.
- Appropriate SOPs had been followed.
- Analysis information was correct and complete.
- Analytical results were correct and complete.
- QC samples were within established control limits.
- Blanks were within the appropriate QC limits.
- Calibration data were scientifically sound and appropriate.
- QC samples were within established guidelines.
- Qualitative and quantitative results were correct.
- Documentation was complete.

This level of review serves as a compliance check of the contracted analytical services and ensures that the analyst followed the appropriate procedures to prepare and analyze the samples. It also ensures that the analytical data were appropriately documented and affiliated with scientifically sound production QC batches. These requirements are concerned with specifications that are not sample dependent; that is, they specify performance requirements on matters that are fully under a laboratory's control. The specific areas include sample preparation, holding time, calibrations, method blanks, laboratory control samples, laboratory duplicate analyses, internal standards performance, and appropriate compound identification.

The next level of data review focuses on specifications that are sample dependent and include performance requirements that are not under a laboratory's control. These specific areas include trip and field blanks, matrix spike and spike duplicate sample analysis, matrix and field duplicate sample analysis, surrogate recovery, and interferences and dilutions from target and nontarget analytes. This level of data quality review provides a quantitative measure of precision, accuracy, and sensitivity. It is useful in assessing the appropriateness of the selected analytical protocols and identifies some of the limits of the analytical data.

The final level of review interprets this information into a usable assessment understood by the project team. Standard data qualifiers were used as a means of classifying the data as to their conformance to QA/QC requirements. The data qualifiers are defined as follows:

[ ]	Detected. The component was analyzed for and detected at the concentration level shown.
[U]	Undetected. The component was analyzed for but not detected at a concentration equal to or greater than the laboratory reporting limit.

[J] An estimated value. This flag was used when the data indicated the presence of a component below the stated reporting limit or when the direction of analytical bias was unknown.

[B] Blank contaminated. The analyte was detected in the sample and in the associated method, field, or trip blank. The quantitation of the analyte is biased high by the presence of the analyte. The presence of the analyte in the sample may or may not be wholly attributable to contamination.

[R] Unusable data. This flag was used when the associated QA/QC data indicated significant deficiencies in the analytical data and that the data should not be used to make project decisions.

Discussion of Data Quality Review Findings

The following discussion covers the more significant QC problems encountered, how they were resolved, and their effect on the data. The discussion is provided to further define the analytical program and explain deviations from analytical methods.

Data Documentation

The first submittal of analytical reports provided by the laboratory was incomplete and unorganized. The reports were missing matrix spike summaries, initial and continuing calibration summaries, bench sheets, methylene chloride quantitative results, and percent solids results. The laboratory resubmitted the matrix spike summaries, bench sheets, methylene chloride quantitative results, and percent solids results. Initial and continuing calibration summaries were not provided.

Methylene chloride was present in all samples. Because of instrument calibration deficiencies, the results were not reported although the samples appear to have had considerable quantities. No action was taken for this deficiency because the results are biased as a result of an unacceptable calibration curve and laboratory contamination. All methylene chloride data were deemed unreliable and are flagged "R," unusable (see "Calibration" and "Contamination" below).

Initial calibration and continuing calibration summaries were not provided for any of the VOC analyses. The calibration information is used to assess the accuracy and precision of the analytical measurement. Instead of using a calibration summary, the laboratory indicates measurement accuracy and precision by flagging the raw data results with a unique qualifier whenever an analyte is outside an acceptable calibration

(i.e., $\geq$ 10 percent difference). This practice does not allow the reviewer to assess the magnitude of the outlier, thus all results associated with an outlier calibration, without consideration of the magnitude of error, were reported as estimated.

The analysis date as shown on the quantification report header (i.e., raw data) does not match other summary forms, such as injection logbook, method blank summaries, and PAL summary of analyses. The laboratory has indicated that this a quirk of the data reduction system and that the injection logbooks and data summaries are accurate.

The target list of analytes should have been the list of VOCs promulgated under Wisconsin Code NR-140; however, the laboratory reported all analytes detected using SW-846 Method 8021.

Substitution of Methodology

The laboratory used SW-846 Method 5030/8240 to test samples 9301175-05, 9301204-07, and 9301204-08. The substitution was necessary because the laboratory's production capacity was temporarily limited and thus allowed the analysis to occur within the prescribed holding time requirements. The method substitution has the potential to affect the project objectives for the following reasons.

Required detection limits may not be achieved. The nominal method quantification limits (i.e., the concentration level that the laboratory reports as nondetected analytes) for Method 5030/8240 are five times higher than those expected using Method 5030/8021. In each of the affected samples a targeted compound was detected and reported. If Method 5030/8021 had been used, then the laboratory would have diluted the sample before analysis to measure the target compound within an acceptable quantification range. Thus the method quantification limits would have been the same using either test method.

Data may not be comparable to data generated using Method 5030/8021. Each method has different accuracy and precision goals, measurement sensitivity, and identification protocols; therefore, the two different methods may not provide comparable data. Because the differences are slight the outcome appears to be insignificant.

Data documentation. The types of documentation for Method 5030/8240 differ from those of Method 5030/8021, and the laboratory did not provide complete documentation for Method 5030/8240. For samples tested using Method 5030/8021, it was assumed that the instrumentation used to measure VOCs was operated properly and performed satisfactorily.

Analyte Identification

The compound 2,2-dichloropropane was improperly identified. This analyte coelutes with cis-1,2-DCE on the gas chromatography analysis. It is distinguished from cis-1,2-DCE because it does not respond generously on the PID detector, whereas cis-1,2-DCE responds to both the PID and HALL. The laboratory reassessed its identification and now reports 2,2-dichloropropane as cis-1,2-DCE.

Calibrations

As described earlier, the documentation of initial and continuing calibration was inadequate to assess the magnitude of the calibration outlier. Only continuing calibrations containing outliers $\geq$ 10 percent difference are noted. The laboratory has stated that 80 percent of the analytes are within 10 percent difference and the remaining 20 percent are within 15 percent. If that is the case, then the accuracy and precision would not be contested; however, no documentation exists to support the laboratory's claim.

Many of the VOC analyses detected peaks having a response greater than the demonstrated calibration range of the instrument or use calibration response factors outside acceptable precision requirements. All detections associated with these outliers are flagged with a "J," which means the concentration value is an estimate.

The calibration response factor for methylene chloride was biased. The bias was due in part to the presence of methylene chloride in the calibration analysis resulting from contamination. Because of that limitation, the data reduction system is unable to report methylene chloride reliably. All the data were deemed unreliable and were flagged "R," unusable.

Instrument Performance

The PID detector was not operating properly as evidenced by the excessive baseline drift. The laboratory has reviewed its records and determined that the detector leaked from a defective O-ring. Because of the excessive baseline drift it was not possible to review the PID response for many of the samples. This information would have been used to assess the validity of the sample identification. Instead, the identifications were assessed by reviewing the retention time characteristics.

Surrogate Spike Performance

There was no attempt by the laboratory to reanalyze samples having surrogate recoveries outside the laboratory defined acceptable limits. As the laboratory had just begun to use

surrogates in the test protocols and establish a database to calculate statistically based limits, the limits used for water (75 to 125 percent recovery) and soil (50 to 150 percent recovery) were arbitrary and advisory.

The SW-846 methodology requires the laboratory to calculate statistical limits for surrogate spike recoveries after 30 data points have been collected. Thus the limits were not derived. Overall the surrogate recoveries were not grossly out of limits, so no action was taken.

Matrix Spike Performance

Overall the spike recoveries were within acceptable recovery limits. In several analyses the native concentration of TCE was greater than the spiked level resulting in ambiguous results. No conclusions can be drawn from the results. The accuracy and precision as indicated from the spike results does not appear to be biased, so no action was taken.

Contamination

The laboratory improperly stored the samples from projects 9301175 and 9301194 in a refrigerator used to store samples collected from underground storage tank and petroleum contaminated sites. Samples of that type are preserved with either methanol or methylene chloride and contain high concentrations of petroleum hydrocarbons. There is a strong potential for cross contamination between samples.

The field investigation samples were obviously contaminated with methylene chloride and appeared to have been contaminated with petroleum hydrocarbons as well. The reliability of the data for low concentration level petroleum hydrocarbons is not well understood, but because the potential for contamination is so great that the results of methylene chloride and petroleum hydrocarbon constituents (i.e., substituted benzene's) were flagged "R," unusable.

The result for TCE in sample 9301204-03 is unreliable because the purging vessel used for sample 9031204-03 previously held a sample containing 65 μg/kg TCE. It is likely that inadequate cleaning of the purging vessel contributed to the low level detection. The result was flagged "R," unusable.

Results

Project 9301101

TCE was quantified in sample 9301101-01 outside an acceptable calibration window and was flagged "J."

Project 9301149

TCE was quantified in sample 9301149-01 outside an acceptable calibration window and was flagged "J."

Sample 9301149-03 followed a continuing calibration that was not reported. No action was necessary as a continuing calibration and calibration blank were performed acceptably at the beginning of the day.

Sample 9301149-02 was reported with a surrogate recovery value outside the acceptable limits. The results were not qualified as the recovery ranges are advisory only.

Field replicate precision between samples 9301149-01 and -03 were acceptable. Both samples required dilutions because of the high concentration of TCE. Sample 9301149-01 was diluted 5 times and sample 9301149-03 was diluted 10 times. Some compounds (MTBE, 1,1-DCA, and vinyl chloride) were detected in sample 9301149-01 that were not measured in sample 9301149-03. These may not have been measured because sample 9301149-03 was diluted more than sample 9301149-01 and the compounds were diluted to levels that were no longer detectable.

Project 9301175

Sample 9301175-05 was tested using EPA Method 5030/8240 outside holding times. Project required detection limits were not achieved; however, because TCE was detected at a high concentration the laboratory would not have been able to meet the required detection limits even if it had used EPA Method 5030/8021. Data from this method may not be comparable to data generated using EPA Draft Method 5030/8021. Because the sample was tested outside holding times all values have been flagged "J," estimated.

TCE and 1,1,1-TCA were quantified in samples 9301175-04 and -05 outside an acceptable calibration window and were flagged "J," estimated.

Sample 9301175-02 was reported with a surrogate recovery value outside the acceptable limits. The results were not qualified as the recovery ranges are advisory only.

Field replicate precision between samples 9301175-01 and -03 was acceptable.

Sample 9301175-04 reported toluene at a concentration level of 1.8 μg/L. Because there is a high potential of laboratory contamination the detection of toluene was flagged "R," unusable.

Project 9301194

TCE was quantified in sample 9301194-04 outside an acceptable calibration window and was flagged "J," estimated.

Samples 9301194-01, -02, -03, and -04 were reported with a surrogate recovery value outside the acceptable limits. The results were not qualified as the recovery ranges are advisory only.

Project 9301204

Samples 9301204-07 and -08 were tested using EPA Method 5030/8240 to achieve the required holding times. Project required detection limits were not achieved; however, because TCE was detected at high concentration the laboratory would not have been able to meet to required detection limits even if it had used EPA Method 5030/8021. Data from this method may not be comparable to data generated using EPA Draft Method 5030/8021.

Samples 9301204-01, -03, -04, -07, -08, -10, and -13 were reported with a surrogate recovery value outside the acceptable limits. The results were not qualified as the recovery ranges are advisory only, except sample 9301204-03 which exhibited low recoveries. Results from sample 9301204-03 were flagged "UJ" and "J," estimated.

Field replicate precision between samples 9301204-07 and -08 was acceptable.

Sample 9301204-03 reported several petroleum hydrocarbon constituents at a concentration level approaching the detection limits. The compounds were bromobenzene and chlorotoluene were misidentified because of the presence of coeluting peaks (resulting from the petroleum hydrocarbons) and were flagged "R," unusable. Because the high potential of laboratory contamination the measurement of petroleum hydrocarbons is suspect; however, other circumstantial evidence (i.e., visual information obtained during sample collection and the petroleum hydrocarbon profile on the PID detector) suggests that the measurements are real.

Sample 9301204-09 reported naphthalene and trimethylbenzene at a concentration level approaching the detection limits. Because there is a high potential of laboratory contamination these detections were flagged "R," unusable.

Project 9301219

Samples 9301219-03, -04, -05, -09, and -10 were reported with a surrogate recovery value outside the acceptable limits. The results were not qualified as the recovery ranges are advisory only.

Field replicate precision between samples 9301219-04 and -05 was acceptable. TCE was measured in sample 9301219-04 at 1.9-μg/L but not in sample 9301219-05. At low concentration levels this is not unlikely. Precision between samples 9301219-02 and -03 were generally acceptable; however, sample 9301219-02 contained petroleum hydrocarbon constituents at low concentrations that did not appear in sample 9301219-03. The petroleum hydrocarbons in sample 9301219-02 were flagged "R," unusable, because of contamination issues. In the event the detection was real, the differences are not unlikely because of the variability expected from sampling and testing. Precision between samples 9301219-07 and -08 was generally acceptable, but sample 9301219-07 contained PCE and cis-1,2-DCE that was not detected in sample 9301219-08. Sample 9301219-08 contained 2,2-dichloropropane that was not detected in sample 9301219-07. The laboratory had incorrectly identified the dichloropropane and should have identified it as cis-1,2-DCE. The results for TCE and 1,1,1-TCA may not comparable because the laboratory did not quantify the results in sample 9301219-08 with an acceptable calibration curve.

As described above, TCE was measured in sample 9301219-04 at 1.9-μg/L but not in sample 9301219-05. At low concentration levels this is not unlikely. The potential for cross contamination was examined. The sample analyzed in sparging tube location from the preceding injection sequence contained 65-μg/kg TCE and may have contributed to the TCE hit in sample 9301219-04. Results for TCE in sample 9301219-04 were flagged "R," unusable.

2,2-Dichloropropane was detected in sample 9301219-08. The laboratory reassessed its identification and now reports 2,2-dichloropropane as cis-1,2-DCE. The result for 2,2-dichloropropane was reported at the nominal quantification limit and flagged "U," undetected.

1,1,1-TCA in sample 9301219-06, TCE and 1,1,1-TCA in sample 9301219-08, and cis-1,2-DCE in samples 9301219-07 and -10 were quantified with an unacceptable calibration curve and flagged "J."

Project 9301233

2,2-Dichloropropane was detected in samples 9301233-01 and -08. The laboratory reassessed its identification and now reports 2,2-dichloropropane as cis-1,2-DCE. The result for 2,2-dichloropropane were reported at the nominal quantification limit and flagged "U," undetected.

Project 9301245

Sample 9301245-02 was a field blank containing toluene at 1 μg/L. Although the field blank sample may have been exposed to toluene, it is important to note that toluene is not a site contaminant and it was not detected in any field sample. The analytical method does not provide confirmation analyses, and the laboratory analyses appear to have been affected by contamination from petroleum hydrocarbon. The detection of toluene is unreliable. Since it has no effect on the data, no action was taken to qualify the data.

Conclusion

The volatile organic and inorganic data were reviewed and qualified using procedures described in this memorandum. Based on the objectives defined in the work plan, the data met the technical goals of the project. The data user is cautioned against making judgments solely on the basis of data that have been associated with identified problems related to improper calibrations, laboratory contamination, holding time exceedance, and biased recoveries.

Table 1
Analytical Data Results for Aqueous Matrix
Mercury Marine Site

Field Sample ID:		MGW01	BLK-01	MGW03	BLK-02	MGW03-FR	MGW02	BLK-03	MGW02-DU	BLK-04	MSB9-GW-6-11	BLK05	MSB7-GW-12-15
Laboratory ID:		9301101-01	9301101-02	9301149-01	9301149-02	9301149-03	9301175-01	9301175-02	9301175-03	9301194-01	9301194-02	9301204-01	9301204-02
Sample Collection Date:		1/13/93	1/13/93	1/15/93	1/15/93	1/15/93	1/20/93	1/20/93	1/20/93	1/21/93	1/21/93	1/22/93	1/22/93
Benzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Bromobenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Bromochloromethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Bromodichloromethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Bromoform	µg/L	15 U	3 U	15 U	3 U	30 U	3 U	3 U	3 U	3 U	300 U	3 U	75 U
Bromomethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
n-Butylbenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
sec-Butylbenzene	µg/L	5 U	1 U	5 U	1 U	10.0 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
tert-Butylbenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Carbon tetrachloride	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Chlorobenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Chloroethane	µg/L	10 U	2 U	10 U	2 U	20 U	2 U	2 U	2 U	2 U	200 U	2 U	50 U
Chloroform	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Chloromethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
2-Chlorotoluene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
4-Chlorotoluene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2-Dibromo-3-chloropropan	µg/L	25 U	5 U	25 U	5 U	50 U	5 U	5 U	5 U	5 U	500 U	5 U	120 U
Dibromochloromethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2-Dibromoethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Dibromomethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2-Dichlorobenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,3-Dichlorobenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,4-Dichlorobenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Dichlorodifluoromethane	µg/L	10 U	2 U	10 U	2 U	20 U	2 U	2 U	2 U	2 U	200 U	2 U	50 U
1,1-Dichloroethane	µg/L	5 U	1 U	7.8	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2-Dichloroethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,1-Dichloroethene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
cis-1,2-Dichloroethene	µg/L	5 U	1 U	100	1 U	62.0	1 U	1 U	1 U	1 U	100 U	1 U	25 U
trans-1,2-Dichloroethene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2-Dichloropropane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,3-Dichloropropane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
2,2-Dichloropropane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,1-Dichloropropene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Ethylbenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Hexachlorobutadiene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Isopropylbenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
p-Isopropyltoluene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Methylene Chloride	µg/L	5 R	1 R	5 R	1 R	10 R	1 R	1 R	1 R	1 R	100 R	1 R	25 R
M-t-butyl-ether	µg/L	5 U	1 U	9.8	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Naphthalene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
n-Propylbenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Styrene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,1,1,2-Tetrachloroethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,1,2,2-Tetrachloroethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Tetrachloroethene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Toluene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2,3-Trichlorobenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2,4-Trichlorobenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,1,1-Trichloroethane	µg/L	30	1 U	5 U	1 U	10 U	8.5	1 U	6.1	1 U	100 U	1 U	25 U
1,1,2-Trichloroethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Trichloroethene	µg/L	310 J	1 U	280 J	1 U	230	33	1 U	28	1 U	2300	1 U	570
Trichlorofluoromethane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2,3-Trichloropropane	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,2,4-Trimethylbenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
1,3,5-Trimethylbenzene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Vinyl Chloride	µg/L	10 U	2 U	11	2 U	20 U	2 U	2 U	2 U	2 U	200 U	2 U	50 U
o-Xylene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
m/p-Xylene	µg/L	5 U	1 U	5 U	1 U	10 U	1 U	1 U	1 U	1 U	100 U	1 U	25 U
Alkalinity	ppm	730		3400		4200	410		400		2600		
Chemical Oxygen Demand	mg/L	270		890		1100	23		18		610		
Iron in Water	mg/L	84		2000		2400	28		26		1700		
Hardess, Total	mg/L	3800		240000		230000	1200		1100		34000		
Total Organic Carbon	mg/L	55		6300		4500	5.7		3		480		

Table 2
Analytical Data Results for Soil Matrix
Mercury Marine Site

Field Sample ID:		MSB8-SS-8-10	MSB8-SS-10-12	MSB9-SS-9-11	MSB9-SS-3-5	MSB7-SS-5-6	MSB7-SS-6-7	MSB7-SS-7-9	MSB10-SS-1-3	MSB10-SS-3-5	MSB10-SS-9-11	MSB11-SS-1-3	MSB11-SSD-1-3	MSB11-SS-5-7	MSB11-SS-9-11	MSB11-SS-9-11	MSB11-SS-13-15
Laboratory ID:		9301175-04	9301175-05	9301194-03	9301194-04	9301204-03	9301204-04	9301204-05	9301204-09	9301204-10	9301204-13	9301219-4	9301219-5	9301219-6	9301219-7	9301219-8	9301219-9
Sample Collection Date:		1/20/93	1/20/93	1/21/93	1/21/93	1/22/93	1/22/93	1/22/93	1/22/93	1/22/93	1/22/93	1/25/93	1/25/93	1/25/93	1/25/93	1/25/93	1/25/93
Benzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Bromobenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	8.1 R	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Bromochloromethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Bromodichloromethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Bromoform	µg/L	3 U	15 UJ	16 U	4 U	3.7 UJ	15 U	14 U	3.6 U	3.4 U	3.2 U	3.7 U	3.7 U	3.6 U	17 U	3.6 U	3.3 U
Bromomethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
n-Butylbenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	3.9 J	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
sec-Butylbenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	8.0 J	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
tert-Butylbenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	8.4 J	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Carbon tetrachloride	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Chlorobenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Chloroethane	µg/L	2 U	10 UJ	10 U	2.6 U	2.4 UJ	9.9 U	9.6 U	2.4 U	2.3 U	2.1 U	2.4 U	2.5 U	2.4 U	11 U	2.4 U	2.2 U
Chloroform	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Chloromethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
2-Chlorotoluene	µg/L	1 U	5 UJ	5.2 U	1.3 U	4.9 R	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
4-Chlorotoluene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,2-Dibromo-3-chloropropan	µg/L	5 U	25 UJ	26 U	6.6 U	6.1 UJ	25 U	24 U	6 U	5.6 U	5.3 U	6.1 U	6.2 U	6 U	29 U	5.9 U	5.5 U
Dibromochloromethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,2-Dibromoethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Dibromomethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,2-Dichlorobenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,3-Dichlorobenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,4-Dichlorobenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Dichlorodifluoromethane	µg/L	2 U	10 UJ	10 U	2.6 U	2.4 UJ	9.9 U	9.6 U	2.4 U	2.3 U	2.1 U	2.4 U	2.5 U	2.4 U	11 U	2.4 U	2.2 U
1,1-Dichloroethane	µg/L	1 U	9.8 J	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	4.4	5.7 U	8.9	1.1 U
1,2-Dichloroethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,1-Dichloroethene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
cis-1,2-Dichloroethene	µg/L	1 U	38 J	5.2 U	1.3 U	2.0 J	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	8.4	20 J	17 J	1.1 U
trans-1,2-Dichloroethene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,2-Dichloropropane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,3-Dichloropropane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
2,2-Dichloropropane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,1-Dichloropropene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Ethylbenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Hexachlorobutadiene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Isopropylbenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	3.1 J	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
p-Isopropyltoluene	µg/L	1 U	5 UJ	5.2 U	1.3 U	3.7 J	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Methylene Chloride	µg/L	930 R	720 R	1000 R	1.3 R	1.2 R	4.9 R	4.8 R	1.2 R	1.1 R	1.1 R	1.2 R	1.2 R	1.2 R	5.7 R	850 R	1.1 R
M-t-butyl-ether	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Naphthalene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	2.3 R	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
n-Propylbenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	3.1 J	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Styrene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,1,1,2-Tetrachloroethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,1,2,2-Tetrachloroethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Tetrachloroethene	µg/L	1 U	5 UJ	21	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	8.5	1.1 U
Toluene	µg/L	2.1 R	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,2,3-Trichlorobenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,2,4-Trichlorobenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,1,1-Trichloroethane	µg/L	100 J	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	65 J	62	103 J	1.1 U
1,1,2-Trichloroethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Trichloroethene	µg/L	130 J	580 J	150	100 J	57 J	92	180	1.2 U	1.1 U	7.5	1.9 R	1.2 U	44	91	69 J	1.1 U
Trichlorofluoromethane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,2,3-Trichloropropane	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,2,4-Trimethylbenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	6.7 J	4.9 U	4.8 U	3.8 R	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
1,3,5-Trimethylbenzene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.3 J	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Vinyl Chloride	µg/L	2 U	10 UJ	10 U	2.6 U	2.4 UJ	9.9 U	9.6 U	2.4 U	2.3 U	2.1 U	2.4 U	2.5 U	2.4 U	11 U	2.4 U	2.2 U
o-Xylene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
m/p-Xylene	µg/L	1 U	5 UJ	5.2 U	1.3 U	1.2 UJ	4.9 U	4.8 U	1.2 U	1.1 U	1.1 U	1.2 U	1.2 U	1.2 U	5.7 U	1.2 U	1.1 U
Alkalinity	ppm																
Chemical Oxygen Demand	mg/L																
Iron in Water	mg/L																
Hardess, Total	mg/L																
Total Organic Carbon	mg/L	510	1200	370	430	7500	520	430	1400	400	510	3900	3200	380	470	320	8.3

Table 1
Analytical Data Results for Aqueous Matrix
Mercury Marine Site

Field Sample ID:		MFB01	MSB7-GW-18-28	MSB7-GWD-18-28	BLK-06	MSB10-GW-13-23	MSB10-GW-13-23 DUP	MSB11-GW-12-15	MSB11-GW-18-28	BLK07	MSB12-GW-14-19	MFB02	BLK08
Laboratory ID:		9301204-06	9301204-07	9301204-08	9301219-1	9301219-2	9301219-3	9301219-10	9301233-01	9301233-02	9301245-01	9301245-02	9301245-03
Sample Collection Date:		1/22/93	1/22/93	1/22/93	1/25/93	1/25/93	1/25/93	1/25/93	1/26/93	1/26/93	1/27/93	1/27/93	1/27/93
Benzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Bromobenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Bromochloromethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Bromodichloromethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Bromoform	µg/L	3 U	75 U	75 U	3 U	3 U	3 U	30 U	15 U	3 U	3 U	3 U	3 U
Bromomethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
n-Butylbenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1.0 U	1 U	1 U	1 U
tert-Butylbenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Chlorobenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Chloroethane	µg/L	2 U	50 U	50 U	2 U	2 U	2 U	63	39	2 U	2 U	2 U	2 U
Chloroform	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Chloromethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
2-Chlorotoluene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
4-Chlorotoluene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropan	µg/L	5 U	120 U	120 U	5 U	5 U	5 U	50 U	25 U	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Dibromomethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	µg/L	2 U	50 U	50 U	2 U	2 U	2 U	20 U	10 U	2 U	2 U	2 U	2 U
1,1-Dichloroethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	92	92	1 U	1 U	1 U	1 U
1,2-Dichloroethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	110 J	12	1.0 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Ethylbenzene	µg/L	1 U	25 U	25 U	1 U	1.2 R	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Isopropylbenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
p-Isopropyltoluene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Methylene Chloride	µg/L	1 R	35 R	33 R	1 R	1 R	1 R	10 R	88 R	1 R	1 R	1 R	1 R
M-t-butyl-ether	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Naphthalene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
n-Propylbenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Styrene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,1,1,2-Tetrachloroethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Tetrachloroethene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Toluene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1	1 U
1,2,3-Trichlorobenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,2,4-Trichlorobenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	16	158	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Trichloroethene	µg/L	1 U	99	100	1 U	1 U	1 U	77	5 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Vinyl Chloride	µg/L	2 U	50 U	50 U	2 U	2 U	2 U	130	90	2 U	2 U	2 U	2 U
o-Xylene	µg/L	1 U	25 U	25 U	1 U	1 U	1 U	10 U	5 U	1 U	1 U	1 U	1 U
m/p-Xylene	µg/L	1 U	25 U	25 U	1 U	4.7 R	1 U	10 U	5 U	1 U	1 U	1 U	1 U
Alkalinity	ppm	4.1	3600	4800		400		72000	600		480	6	
Chemical Oxygen Demand	mg/L	5 U	340	230		160		5600	58		22	5.6	
Iron in Water	mg/L	0.86	340	290		77		2600	490		25	0.15	
Hardess, Total	mg/L	17	44000	28000		21000		340000	9800		3100	8.9	
Total Organic Carbon	mg/L	1 U	330	26		46		2600	20		7.3	3.9	