



DAMES & MOORE

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rec'd 10/16/90

October 15, 1990

Mr. Wendell J. Wojner
Department of Natural Resources
Southern District Headquarters
3911 Fish Hatchery Road
Fitchburg, Wisconsin 53711

RE: Ursula Borgerding Estate Property, 435 Woodward Avenue, Beloit

Dear Mr. Wojner:

Enclosed is a copy of the report of the subsurface investigation performed at the Ursula Borgerding Estate property. As you know, the Estate has an option to sell the property contingent on a WDNR-approved remedial action plan being implemented before the end of the year (we have obtained an extension from the original deadline of October 1, 1990). We are therefore under very tight time constraints. I realize that you have an extremely heavy case load, however I would appreciate your timely review of the report and comments on our recommendations. Also, if you can give me a rough estimate as to when we may expect your comments, the potential buyer may be somewhat appeased.

Please contact me at your earliest convenience with any comments or questions.
Thank you for your efforts.

Sincerely,

DAMES & MOORE, LTD.

Kristine M. Stehr
Project Manager and Hydrogeologist

Enclosure

cc: Frances B. Sheehy, Rep.

rec'd 10/11/90

SUBSURFACE INVESTIGATION

URSULA BORGERDING ESTATE

435 WOODWARD AVENUE

BELOIT, WISCONSIN

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1.0 INTRODUCTION

The Ursula Borgerding Estate (Estate) property is located at 435 Woodward Avenue, Beloit, Wisconsin. The property occupies a portion of the northeast $1/4$ of the northeast $1/4$ of Section 35, Township 1 north, Range 12 east (NE $1/4$, NE $1/4$, Se. 35, T. 1 N, R. 12 E; Figure 1). The site is bounded by the Rock River, to the west, Woodward Avenue, to the south, and a City of Beloit green area to the north. East of the property is the Chicago, Milwaukee and St. Paul Chicago and Northwestern railroad line and commercial development.

The site is located on the flood plain of the Rock River. There is little topographic expression at the site; however, the ground elevation rises approximately 30 feet over a 500-foot distance immediately east of Pleasant Street, less than 200 feet east of the site.

In conjunction with plans to sell the property, six underground storage tanks and three above-ground tanks were removed and an environmental investigation, in accordance with Department of Industry, Labor and Human Relations (DILHR), was performed in November, 1989. During the closure investigation, it became apparent that the soil and ground water in the area of the underground storage tanks had been impacted. This discovery prompted the following site investigation.

1.1 PURPOSE AND SCOPE

The purpose of the investigation was to determine the lateral boundaries of the environmental impact and provide recommendations for corrective action that address the Wisconsin Department of Natural Resources (WDNR) guidelines for site restoration. The scope of the investigation included a review of the site history and a review of data presented in the CBC Environmental Services underground storage tank closure report, dated December 11, 1989. The scope of the investigation included the installation of five soil borings, three of which were converted to monitoring wells. The scope was increased to include the installation of six additional soil borings, three of which were converted into monitoring wells.

1.2 SITE HISTORY

The Ursula Branigan Borgerding family has owned the Estate property since May 14, 1913, when Edward R. Branigan purchased the lot from the City Ice Company. Before coming under ownership by Edward Branigan, the Estate property was owned by several private individuals and corporations, including the Rock River Paper Mill, the Beloit College, the Beloit Water Power Company and the Knickerbocker Ice Company.

Operators on the property during the ownership by Edward Branigan included Standard Oil Company of Indiana (lease from May 4, 1931, terminating May 31, 1933) and the City Ice & Fuel Company. City Ice & Fuel cut ice blocks from the Rock River and shipped them via the Chicago, Milwaukee and St. Paul Chicago and Northwestern Railway Companies, which operated railroad lines on the eastern border of the property. City Ice & Fuel maintained large coal piles on or immediately adjacent to the Estate property. Historical photographs also indicate that Deep Rock, of Illinois, maintained above ground storage tanks on or adjacent to the property (Figure 2). The storage tanks are suspected to have contained diesel fuel for the railway operation.

Edward Branigan willed the property to Robert and Evelyn (wife) Branigan in 1946, who released the property to their daughter, Ursula Branigan Borgerding, later in the same year. Since Ursula Borgerding has owned the property, operators at the site have included Price Rite Gas, Drevdahl Automotive Painting, Heritage Painting & Decorating, and Superior Automotive Electric.

On May 24, 1984, a 1000-gallon gasoline release occurred at the Price Rite Gas station. The release occurred when an employee of Richards Brothers, the gasoline carrier for U.S. Oil, failed to shut the proper valve during tank-filling activities. Beloit fire and police departments responded to the spill by diking and foaming the gasoline. The spill was remediated under the direction of WDNR staff, who recommended that the remaining material be absorbed with sand. The spill is documented in the WDNR "Statewide Spills and Hazardous Incident Report," dated September 7, 1989.

*Location
+ impact
area?*

The future plans for the site are to raze the existing buildings and incorporate the site into a river-front parkway system. The property is expected to be turned over to the City of Beloit following park development.

2.0 PREVIOUS WORK

In November, 1989 Frances Borgerding Sheehy, representative for the Ursula Borgerding Estate, contracted Autoquip, Incorporated to remove the six underground and three above-ground storage tanks located at the property¹. Upon removal of the tanks, significant gasoline contamination was identified in the soil and ground water in the tank area immediately west of the Heritage Painting & Decorating building (UST Location 1, Figure 3). The tanks in UST Location 1 most recently contained gasoline and fuel oil and were used to service the various gas stations operating out of the building most recently occupied by Heritage Painting & Decorating. The ages of the tanks are not known.

Low-level photoionization detector (PID) readings were recorded for the soils contained in a concrete vault located between the Heritage Painting & Decorating and Drevdahl Automotive Painting buildings (UST Location 2). The soils were completely excavated from the vault, which was later filled with clean fill material and covered with concrete. Ground water was not encountered in the UST Location 2 excavation.

In response to the high PID readings for the soils in UST Location 1, the UST closure assessment was abandoned in favor of performing a subsurface investigation with the objectives of defining the lateral and vertical boundaries of the soil and ground water contamination.

The first phase of the subsurface investigation was initiated on March 14, 1990 and is detailed in the following sections.

¹ The field activities and laboratory results associated with the UST closure are presented in the CBC Environmental Services report titled, "A Report for an Underground Storage Tank Closure Site Assessment at 435 Woodward Avenue, Beloit, Wisconsin," dated December 11, 1989.

3.0 PHASE I SUBSURFACE INVESTIGATION

Dames & Moore was retained by the Ursula Borgerding Estate to conduct the subsurface investigation at the Estate property. Dames & Moore personnel performed the first phase of the investigation on March 14, 1990. The first phase of the investigation consisted of installing five soil borings, three of which were converted into monitoring wells. The locations of the borings and monitoring wells are shown in Figure 4.

3.1 FIELD METHODOLOGY

Soil samples were collected at 2.5 foot intervals, using a split spoon sampler, in accordance with ASTM methods D-1452 and D-1586. All samples were examined for characteristics such as texture, moisture content and signs of contamination. The soil characteristics and other sample-specific observations were recorded on soil boring logs (Appendix A). Bentonite chips were used to abandon the borings.

Samples from each interval were containerized in 4 oz. glass jars with teflon-lined lids. Each sample was screened in the field, using a Photovac photoionization detector (PID). The PID yields a semi-quantitative head-space analysis of the volatile compounds in the sample. PID readings are shown on the soil boring logs.

Between each sampling episode, the split spoon was washed in a TSP solution and double rinsed in clean tap water. All down-hole equipment was steam cleaned between borings.

Soil borings B-1, B-2 and B-3 were converted into monitoring wells MW-1, MW-2 and MW-3 respectively. Due to the presence of ground water at depths of two to ten feet below the ground surface, a well-construction variance from Wisconsin Administrative Code NR 141 was requested. The variance was granted by Wendell J. Wojner, the WDNR representative overseeing the project, on March 14, 1990. Appropriate well construction methods for high ground water conditions, were suggested by Mike Lemke of the WDNR. Mr. Lemke's suggestions were incorporated into the well designs. The well construction logs are presented in Appendix B.

The monitoring wells were developed and sampled in accordance with Wisconsin Administrative Code NR 141. Details of the development procedure and volumes of water purged are given on the well construction logs (Appendix B).

3.2 LABORATORY ANALYSES

Soil and ground water samples were transported on ice to the Chem-Bio Corporation laboratory in Oak Creek, Wisconsin for chemical analysis. Appropriate chain-of-custody procedures were followed at all times. A copy of the chain-of-custody document is presented in Appendix C.

The soil samples were analyzed for total petroleum hydrocarbons (TPH), using an in-house infrared method, similar to the "California" method, whereby the contaminant is identified by matching the chromatogram to those of known standards. The water was analyzed for benzene, toluene, ethylbenzene and xylene (BTEX), using EPA method 601/602.

The results of the laboratory analyses are summarized in Table 1 (soil samples) and Table 2 (ground water). The laboratory reports are presented in Appendices D and E (soil and ground water, respectively). The data is discussed in section 3.3 below.

3.3 DATA ANALYSIS - SAMPLING LOCATIONS 1 THROUGH 5

3.1.1 Soil Borings

The materials encountered during drilling indicate that significant land filling has occurred at the site. Foundry fill was found in all five borings at thicknesses of up to eight feet. Other fill materials encountered included wood and brick. At all boring locations, the soils had petroleum odors, usually increasing in strength with depth of sampling interval. Soils saturated with dark brown to black oily petroleum were encountered near the ground surface in borings MW-2 and MW-3 and at depths of eleven feet in boring MW-1.

Soil types encountered below the fill materials consisted of brown or black organic clay, sandy clay, sand, silt and pebbles. The soils tended to coarsen with depth and generally reflect the fluvial depositional environment.

3.1.2 Laboratory Results

Laboratory analysis of soil and ground water samples indicated impact to the subsurface by gasoline and diesel fuel. The occurrence of gasoline components is consistent with the documented gasoline release of May 24, 1984. According to the data, effects on the subsurface soil from the gasoline spill are seen in highest concentration around UST Location 1 and west, toward the Rock River, at MW-2. The lower concentration of gasoline contamination at B-4 is suspected to be the result of minor releases from the piping or dispenser that operated in that area.

Impact to the subsurface soil by diesel fuel was found at MW-2, and is inconsistent with the site history. Diesel fuel was never stored in the tanks of UST Location 2, nor are there any records or indications of diesel fuel being spilled in that area. The primary theories to explain the presence of diesel fuel are, 1) the above-ground storage tanks, owned by Deep Rock (Figure 2) released diesel fuel to the subsurface or to the ground surface, 2) the foundry fill materials encountered throughout the site were contaminated with diesel fuel, 3) diesel fuel was used during ground filling activities to keep dust or other particulates from becoming airborne, or 4) the chromatogram produced during sample analysis was not distinct and could have been mismatched to the diesel standard. Based on these questions and the fact that the objective of determining the boundaries of impacted soil and water was not fulfilled, a second phase of investigation was initiated.

4.0 PHASE II SUBSURFACE INVESTIGATION

The second phase of the subsurface investigation was conducted on July 5 and 6, 1990 and consisted of installing six soil borings, three of which were converted into monitoring wells.

MW-7 was installed off of the Estate property, on City of Beloit property. The locations of the borings and wells are shown in Figure 5.

4.1 FIELD METHODOLOGY

The methods utilized to install the soil borings and monitoring wells during the second phase of the investigation are identical to those described for the first phase (section 3.1 above). Borings B-6, B-7 and B-10 were converted into monitoring wells MW-6, MW-7 and MW-10, respectively. A variance from NR 141 was obtained from Wendell J. Wojner on July 6, 1990 to construct the monitoring wells in a manner appropriate for the high ground water. As the water table at the MW-7 location was only two to three feet below the ground surface, the screened interval of the well was placed below the water table so that an annular space seal could be installed without interfering with water quality. The well construction logs are presented in Appendix B.

4.2 LABORATORY ANALYSES

Soil and ground water samples were transported on ice to the laboratory for chemical analysis. The soil samples were analyzed at Swanson Environmental, Incorporated, Brookfield, Wisconsin, and the water samples were analyzed at Chem-Bio Corporation. Appropriate chain-of-custody procedures were followed at all times. A copy of the chain-of-custody documents are presented in Appendix C.

The soil samples were analyzed for total petroleum hydrocarbons (TPH) using the California method. In response to the presence of foundry fill materials encountered throughout the site, the analyses for ground water were expanded in an attempt to identify other compounds potentially impacting ground water quality. The water samples were analyzed for volatile organic compounds, including BTEX, using EPA method 8240, and for phenolics, using EPA method 420.2.

The results of the laboratory analyses are summarized in Table 1 (soil samples) and Table 2 (ground water). The laboratory reports are presented in Appendices D and E (soil and ground water, respectively). The data is discussed in section 4.3 below.

4.3 DATA ANALYSIS - SAMPLING LOCATIONS 6 THROUGH 11

4.3.1 Soil Borings

Foundry sands and cinders were encountered in all borings, except B-8, in thicknesses of two to eight feet and at depths of one to ten feet below the ground surface. In several borings, the foundry fill was interlayered with other fill materials, such as brick, sand and gravel. At boring location MW-10, approximately six inches of layered paint and paper was encountered from one to one-and-one-half feet below the ground surface. The soils at this sampling interval (1'-2.5') had a strong solvent odor. Slight solvent odors were noted in soils as deep as five feet at this location. There was no indication of this type of contamination at any other sampling location.

Strong petroleum odors were noted in the soils and ground water at all sampling locations except boring MW-6; only slight petroleum odors were detected in MW-6, at depths around 15'. Dark brown to black, oily petroleum saturated the soils from depths of three feet to depths greater than ten feet below the ground surface. At these intervals, oily sheens were seen on the water in the sampler.

4.3.2 Laboratory Results

Laboratory analyses of soil samples collected from sampling locations 7 through 11 indicate detectable diesel fuel fractions in the soils. The soil sample submitted from soil boring MW-6 was selected to represent the highest concentration of impact at that location as determined by the PID. However, TPH concentrations were below laboratory detection limits.

Ground water samples were analyzed for BTEX, VOCs and phenolics. The greater range of analytical parameters was chosen to determine if the fill materials had impacted the ground water. In the water sample collected from MW-6, trace amounts of carbon disulfide were detected. Carbon disulfide is used industrially in manufacturing a multitude of products, such as rayon, flotation devices, vacuum tubes, explosives, preservatives and cements. It is also used as a solvent, degreaser and pesticide. Possible sources for the carbon disulfide contamination are the fill material used at the site or laboratory contamination. Although carbon disulfide is a regulated waste, limits on concentrations in ground water have not been ratified. However, the proposed regulatory level is 400 ppm, which is significantly greater than the concentrations found in the ground water at the Estate property.

7
In the sample from MW-7, benzene and carbon disulfide were detected. Acetone was also detected, however the concentration was only slightly greater than the concentration found in a laboratory blank and is thought to be the result of laboratory contamination. The benzene source is probably the petroleum encountered in the soil and water during drilling.

The sample collected from MW-10 contained detectible quantities of benzene, carbon disulfide, acetone, 4-methyl-2-pentanone (MIBK) and 2-hexanone. The acetone, MIBK and 2-hexanone contamination is most likely the result of washing paint and paint solvent waste onto the ground in the area of MW-10. MIBK and acetone are regulated substances.

Trace concentrations of phenolics were detected in the water samples collected from monitoring wells MW-6, MW-7 and MW-10. The level for the protection of public health set by the WPA in 1986 for phenol is 3.5 ppm (mg/L), and the level to control taste and odor is 0.3 ppm. The concentrations of phenolics in the Estate ground water are significantly less than these regulatory standards.

5.0 SITE HYDROGEOLOGY

Hydrogeologic data were collected throughout the investigation in order to characterize the aquifer at the Estate property. The foci of the characterization were the determination of 1) the ground water flow direction, 2) the hydraulic gradient, and 3) the hydraulic conductivity of the aquifer. The purpose of the characterization was to determine potential contaminant migration directions, the speed at which contaminants may be transported via ground water and to develop a basis for evaluating different ground water remediation methods.

5.1 GROUND WATER FLOW DIRECTION AND HYDRAULIC GRADIENT

Complete sets of ground water elevation data were collected on July 11, 1990 and July 24, 1990. The elevations of water in the wells were collected using an electronic water-level indicator, marked in increments of 0.01 feet and were correlated to the ground elevation at MW-6, which is 750 feet above MSL. Because the screened interval of monitoring well MW-7 is below the water table and may not accurately reflect the water table elevation at this location, ground water level data from MW-7 were excluded from the calculations of ground water flow and gradient. The ground water contours are shown in Figure 6 (July 11, 1990) and Figure 7 (July 24, 1990).

Both sets of data indicate a steep ground water gradient to the east. The direction of ground water flow indicates that the Rock River may be recharging the ground water at the site. The magnitude of the gradient, approximately 0.036, suggests that there may be a production well east of the Estate property that is influencing the ground water flow. As such, the contamination in the ground water at the site may potentially impact the water being withdrawn at the production well. However, production wells in the area are suspected to be quite deep, and the primary contaminants in the Estate ground water, benzene, toluene, ethylbenzene and xylene, have very low solubilities in water (<0.1%) and densities less than that of water and are therefore, not likely to mobilize in the downward direction to any significant degree. MIBK and 2-hexanone have slightly higher solubilities (<2%) and are also less dense than water. Acetone, although less dense than water, is

miscible. However, the occurrence of acetone seems to be isolated to the MW-10 area and is in such concentrations that its occurrence may be the result of laboratory contamination.

5.2 HYDRAULIC CONDUCTIVITY AND GROUND WATER VELOCITY

Slug tests were conducted on each monitoring well to determine the hydraulic conductivity of the aquifer. The tests were conducted, and the data analyzed as described by Bouwer and Rice, (1976). The data are summarized in Table 3 and the slope plots are presented in Appendix F.

The hydraulic conductivity (K) at the site ranges from 2.6×10^{-4} cm/sec at MW-10 to 1.7×10^{-2} cm/sec at MW-6. The geometric mean value of K is 1.6×10^{-3} cm/sec at the site. The hydraulic gradient at the site is 0.036. Assuming an average effective porosity of 20%, this yields an average linear ground water velocity of approximately 2.9×10^{-4} cm/sec. This value converts to 9.5×10^{-6} feet/sec or approximately 300 feet per year.

6.0 NATURE AND EXTENT OF IMPACTED AREA

6.1 SOIL QUALITY

Adverse impact to the soil at the Estate property is found consistently throughout the site and on City of Beloit property, in the area of MW-7. The area of gasoline impact was defined during the investigation and is depicted in Figure 8. The sampling locations that displayed gasoline fractions in the soil are MW-2, MW-3, B-4 and B-5. In each case, the sample chosen for laboratory analysis was the sample collected from immediately above the water table and not necessarily the sample with the highest PID reading.

The boundaries of impact by diesel fuel in the soil could not be defined, with the exception of sampling location MW-6 (Figure 9). The sample chosen from each location displayed either the highest PID reading or was collected from immediately above or below the ground

water table. In each case, the samples submitted are thought to accurately represent the conditions at the sampling location. The exception is the sample chosen for analysis from B-8. This sample was selected to define the lower boundary of impacted soil and is not representative of the higher concentrations at that location. The TPH data for B-8 is therefore not used to generate the contours depicted in Figure 9. Although laboratory analyses suggest that the diesel fuel impact is concentrated around the Heritage Painting & Decorating and Drevdahl Automotive Painting buildings, this is not consistent with in-field observations and may be the result of the different analytical methods used to determine the concentrations of TPH in the soils². Based on in-field observations, the degree of diesel fuel impact did not differ significantly at any of the sampling locations where diesel fuel was determined to be the petroleum product present.

6.2 GROUND WATER QUALITY

The most significant concentrations of BTEX in the Estate ground water are found in monitoring wells MW-1, MW-2 and MW-3. Of these, the highest concentration is in MW-3, located adjacent to UST Location 1, where the gasoline spill of 1984 occurred. This is consistent with in-field observations and with site history. The second most highly impacted location is MW-1. Based on the ground water flow direction, this area is expected to be impacted by the gasoline spill. However, the high concentration of diesel fuel components in the soil at this location may also have contributed to the impact on the ground water.

Based on the ground water velocity, discussed in section 5.2 above, the BTEX in the ground water, resulting from the 1984 gasoline spill, could be expected to have traveled more than 1900 feet if retardation factors, such as hydrophobic adsorption, are not considered. However, no significant ground water impact by BTEX compounds is seen in monitoring well MW-10, which is less than 200 feet from the spill location and directly in the flow path. This suggests that the silt and clay fractions in the soil, coupled with the high occurrence of organic matter, may be adsorbing the petroleum components and slowing their movement. The occurrence of BTEX compounds in the ground water is shown in Figure 8.

² Soil samples from sampling location MW-1 was analyzed using the Chem-Bio Corporation in-house infrared method; samples from MW-6, MW-7, B-8, B-9, MW-10 and B-11 were analyzed at Swanson Environmental using the California method.

The remediation of the 1984 gasoline release was directed by WDNR personnel according to the guidelines that existed at the time. The present extent of gasoline impacted soil and ground water reflect the inadequacy of those guidelines.

7.0 CONCLUSIONS

Two phases of subsurface investigation have been performed at the Ursula Borgerding Estate property, located at 435 Woodward Avenue in Beloit, Wisconsin. The purpose of the investigation was to determine the lateral and vertical boundaries of soil and ground water impact at the site resulting from 1) the operation of underground petroleum storage tanks, 2) the May 24, 1984 documented gasoline release, and 3) historical activities at the site. The scope of the investigation included a review of historical documents and the installation of eleven soil borings, six of which were converted into monitoring wells.

Historical documents indicate that the site was owned or operated by various agencies, such as Beloit Water Power Company, the Rock River Paper Mill, Standard Oil Company, City Ice & Fuel Company, and Price Rite Gas. Historical photographs show large above-ground storage tanks, displaying the Deep Rock name, located on or adjacent to the Estate property. The operations of any of these companies may have contributed to the adverse environmental impacts identified at the site.

Strong petroleum odors, and in some cases, soils nearly saturated with dark brown to black, oily materials, were encountered in all of the sampling locations, except MW-6. Dark brown, grey or black foundry sand fill material was encountered in all of the borings except B-8. Six of the soil borings, MW-1, MW-2, MW-3, MW-6, MW-7 and MW-10, were converted into monitoring wells.

Laboratory analyses indicate that the impact to the soil from the gasoline spill is limited to the area depicted in Figure 8, which is expected, due to the 1984 gasoline release. Diesel fuel impact to the soils is found throughout the site and is not consistent with historical use of the underground storage tanks that were removed from the property in 1989. Possible

sources of the diesel fuel are 1) releases from the Deep Rock above-ground storage tanks, 2) the use of diesel fuel contaminated foundry fill material at the site, or 3) the spraying of diesel fuel on the site to keep dust or other particulates from becoming airborne. The diesel fuel contamination was found throughout the site and north of the property, on City of Beloit property at MW-7.

Ground water impact by benzene, toluene, ethylbenzene and xylene (BTEX) is concentrated in the areas of MW-1, MW-2 and MW-3. Some impact to the ground water by MIBK and 2-hexanone was found in the area of MW-10. However this appears to be an isolated incident. Additionally, acetone and carbon disulfide were found in water samples from MW-10 and MW-7; however, due to the low concentration, these are thought to be the result of laboratory contamination.

The ground water at the site displays a steep hydraulic gradient, 0.036 feet per foot, from the west to the east. The direction of ground water flow suggests that the Rock River is recharging the ground water. The steepness of the gradient suggests that a production well may be operating somewhere east of the Estate property.

The average linear ground water velocity, as determined using the ground water gradient and the geometric mean of the hydraulic conductivity measurements, is approximately 300 feet per year. Based on these calculations, ground water impact resulting from the 1984 gasoline release could be expected to have traveled more than 1900 feet from the location of the spill and area of gasoline infiltration into the soil. The lack of significant BTEX concentrations at MW-10, less than 200 feet away from and in the path of ground water flow from the spill location, indicates that the migration of these compounds may be slowed by hydrophobic adsorption or other retardation factors.

7.0 RECOMMENDATIONS

Due to the adverse environmental impacts, apparently caused in part by historical activities at the Estate property, specifically the presence of diesel fuel in the soil, complete

restoration of the soil and ground water to pre-industrial conditions may not be practical. The area of gasoline impact has been defined.

Dames & Moore recommends that a pump and treat system be installed to restore the ground water quality in the gasoline-impacted area. The water may be discharged directly to the Rock River or may be passed through a carbon adsorption unit prior to discharge, depending upon the discharge permit requirements. The system may remain in service until BTEX concentrations in monitoring wells MW-1, MW-2, MW-3 and MW-10 are reduced to acceptable concentrations.

Respectfully Submitted,

DAMES & MOORE, LTD.



Kristine M. Stehr
Project Manager and Hydrogeologist



Bruce L. Cutright
Managing Associate

REFERENCES CITED

Bouwer, H. and Rice, R.C., 1976, A slug test for determining hydraulic conductivity of unconfined aquifers with completely of partially penetrating wells: *Water Resources Research*, V. 12, n. 3, p. 423.

TABLE 1
 URSULA BORGERDING ESTATE
 LABORATORY ANALYSIS RESULTS
 SOIL SAMPLES

<u>SOIL BORING I.D.</u>	<u>TPH</u>	<u>CONTAMINANT</u>
MW-1 / 3.5'-5'	1800	DIESEL FUEL
MW-2 / 1'-2.5'	920	GASOLINE
MW-3 / 3.5'-5'	1100	GASOLINE
B-4 / 9.5'-11'	43	GASOLINE
B-5 / 6.5'-8'	3100	GASOLINE
MW-6 / 12'-13.5'	ND	N/A
MW -7 / 6'-7.5'	88	DIESEL FUEL
B-8 / 8.5'-10'	154	DIESEL FUEL
B-9 / 6'-7.5'	604	DIESEL FUEL
MW-10 / 6'-7.5'	41	DIESEL FUEL
B-11 / 6'-7.5'	136	DIESEL FUEL

TPH concentrations in parts per million.
 ND = Concentration below detection limit of 4.0 ppm.
 NA = Not Analyzed.

TABLE 2

URSULA BORGERDING ESTATE
LABORATORY ANALYSIS RESULTS

GROUND WATER SAMPLES

<u>PARAMETER</u>	<u>MW-1</u>	<u>MW-2</u>	<u>MW-3</u>	<u>MW-6</u>	<u>MW-7</u>	<u>MW-10</u>
BENZENE	1300	220	5400	ND	11	12
TOLUENE	ND	9	660	ND	ND	ND
ETHYLBENZENE	71	660	130	ND	ND	ND
XYLENE	100	ND	2100	ND	ND	ND
CARBON DISULFIDE	NA	NA	NA	32	32	54
ACETONE	NA	NA	NA	ND	26	42
MIBK	NA	NA	NA	ND	ND	69
2-HEXANONE	NA	NA	NA	ND	ND	400
PHENOLICS (ppm)	NA	NA	NA	0.01	0.06	0.04

Concentrations in parts per billion unless otherwise noted.

ND = Concentration below detection limit ; see laboratory report
for detection limits.

NA = Not Analyzed.

TABLE 3

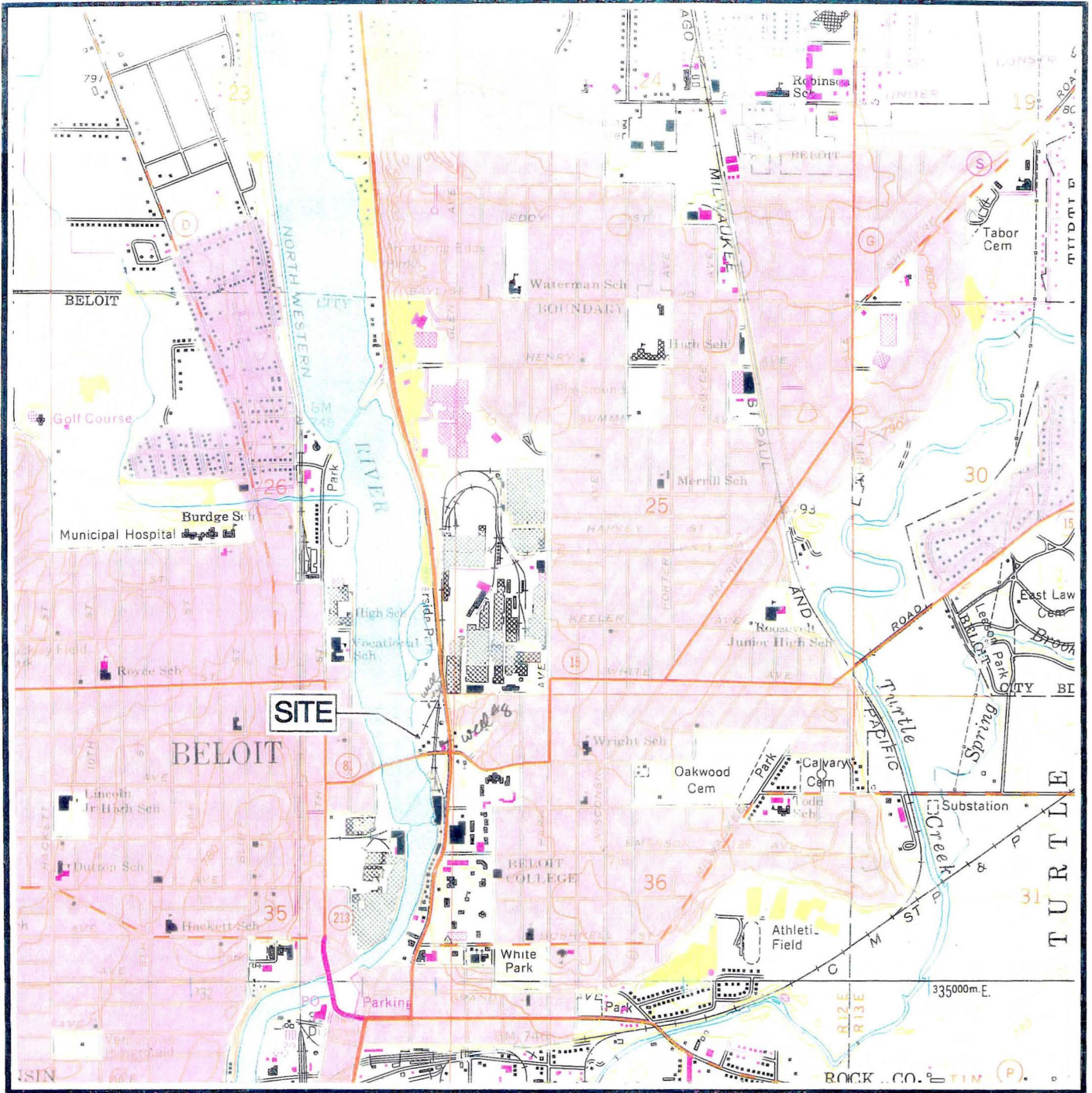
URSULA BORGERDING ESTATE

SLUG TEST DATA

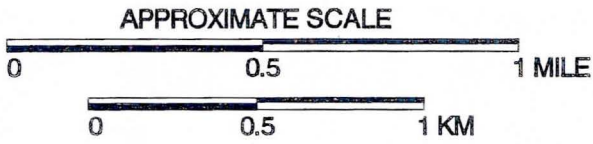
<u>MONITORING WELL</u>	<u>Y1</u>	<u>T1</u>	<u>Y2</u>	<u>T2</u>	<u>Δ Y</u>	<u>Δ T</u>
MW-1	1.33	33	0.69	151	0.64	-118
MW-2	0.47	16	0.29	146	0.18	-130
MW-3	0.20	24	0.06	55	0.14	-31
MW-6	0.36	12	0.03	30	0.33	-18
MW-7	0.04	17	0.02	45	0.02	-28
MW-10	0.23	45	0.10	247	0.13	-202

HYDRAULIC CONDUCTIVITY (K)

MW-1	5.7 E-04 cm/sec
MW-2	4.5 E-04 cm/sec
MW-3	5.0 E-03 cm/sec
MW-6	1.7 E-02 cm/sec
MW-7	3.2 E-03 cm/sec
MW-10	2.6 E-04 cm/sec
GEOMETRIC MEAN	1.6 E-03 cm/sec

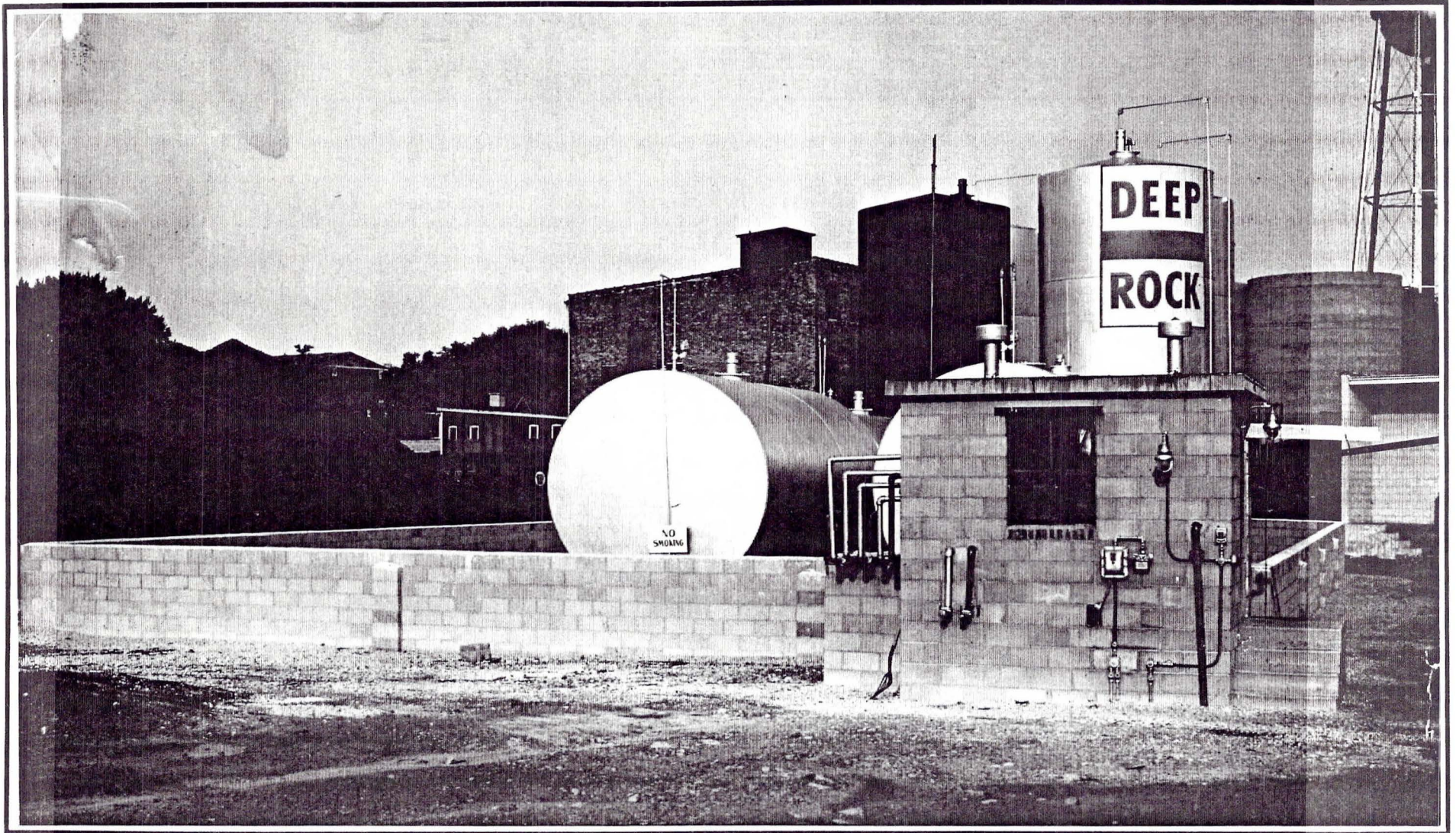


ADAPTED FROM USGS BELOIT QUADRANGLE, 7.5 MINUTE SERIES, 1976.



**FIGURE 1
SITE LOCATION MAP**

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**



PHOTOGRAPH DATE, ESTIMATED 1940.

PHOTOGRAPH TAKEN FROM EDGE OF THE ROCK RIVER, FACING EAST NORTHEAST.

IN FOREGROUND ARE THE PUMP HOUSE AND ABOVE-GROUND STORAGE TANKS ("ABANDONED ABOVE-GROUND STORAGE TANKS AREA" IN FIGURE 2).

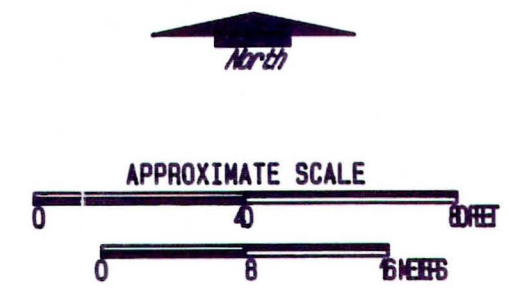
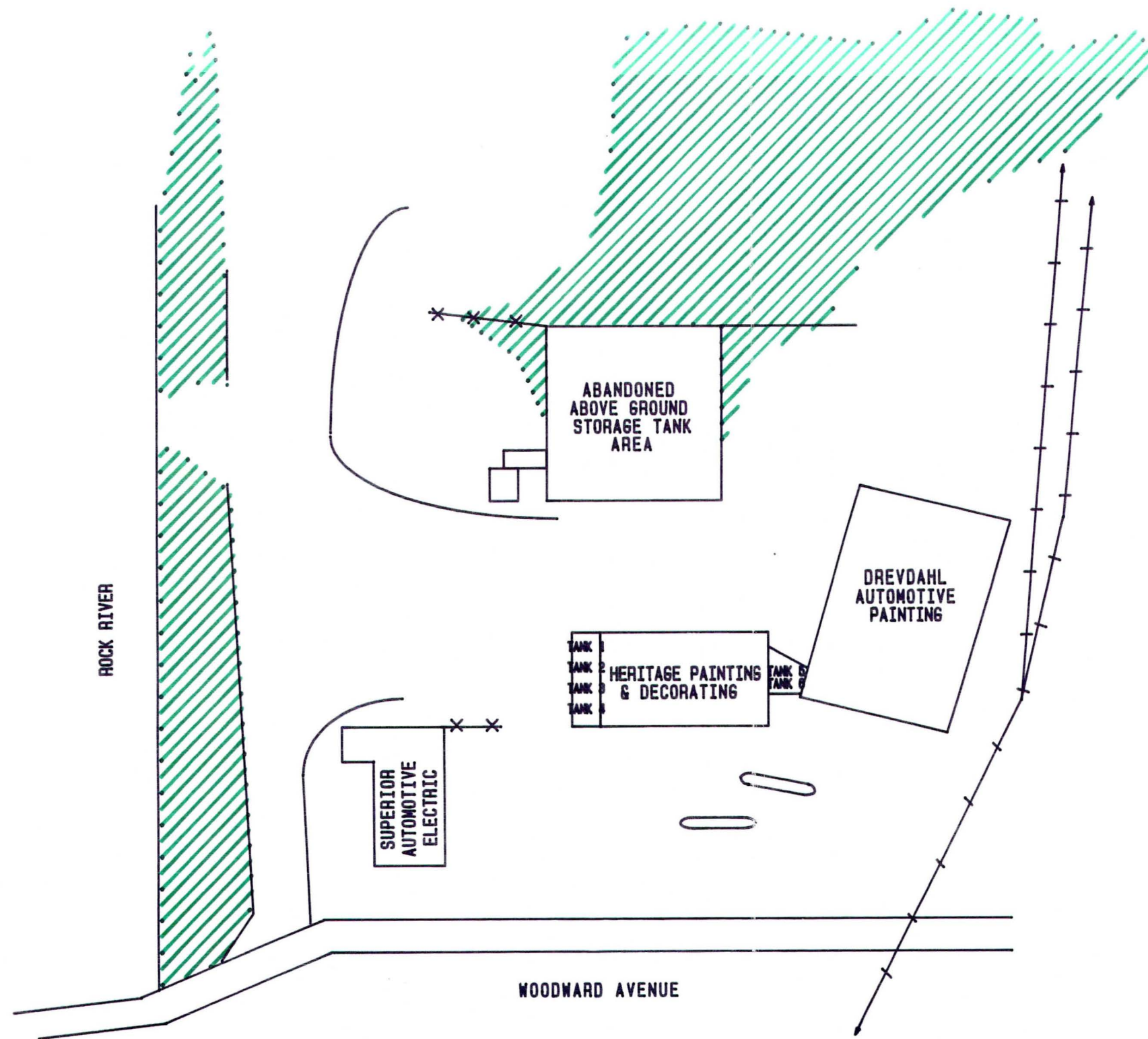
FIGURE 2

**HISTORICAL PHOTOGRAPH
SHOWING COAL PILES AND
ABOVE-GROUND STORAGE TANKS**

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

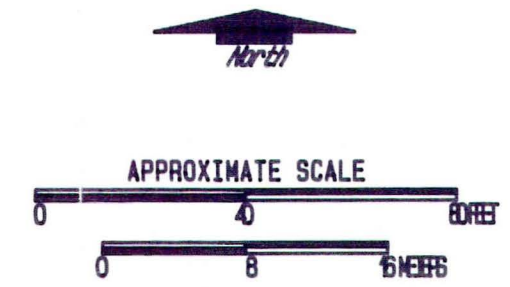
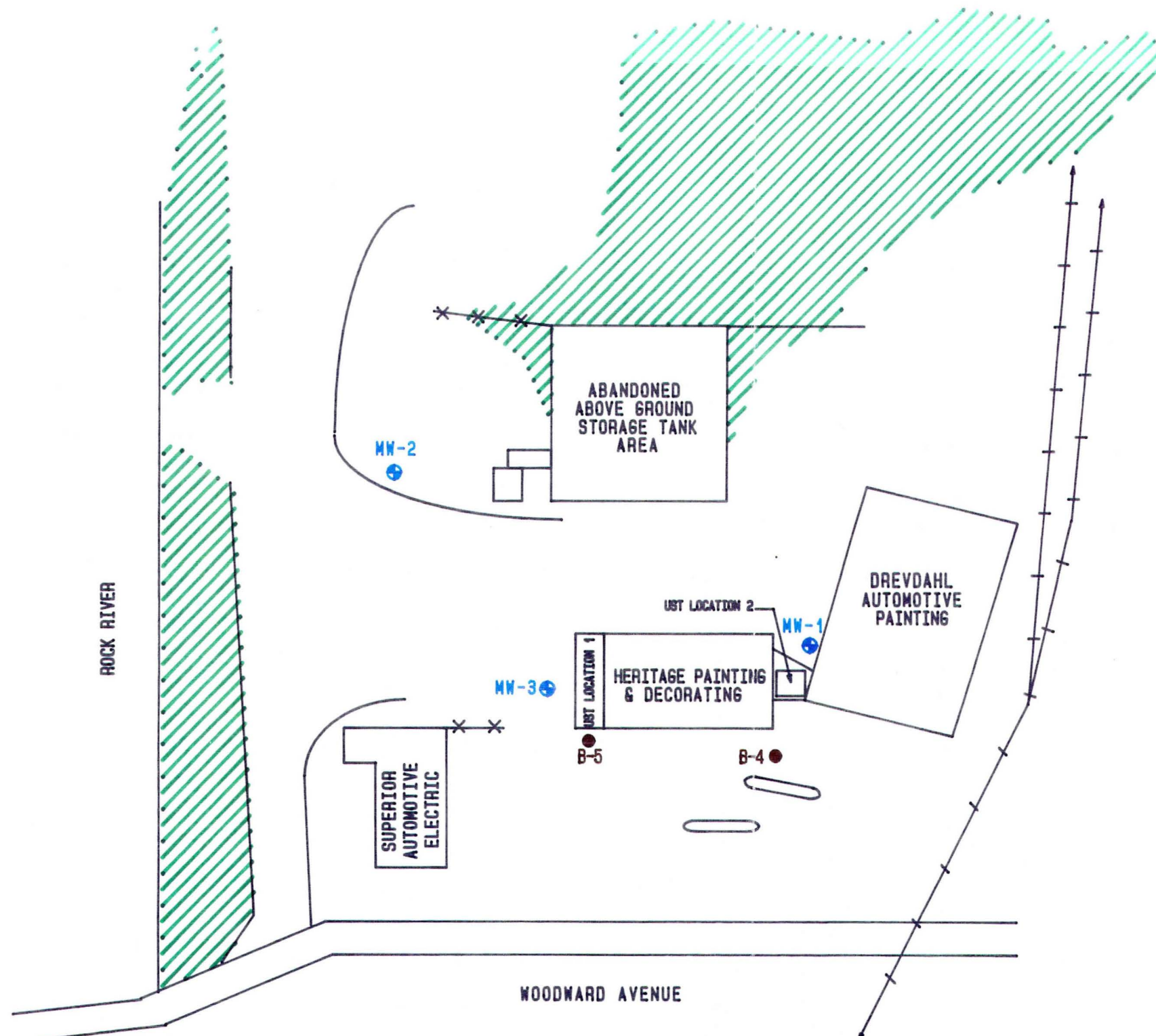
Dames & Moore





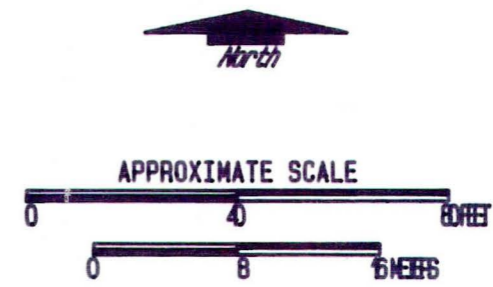
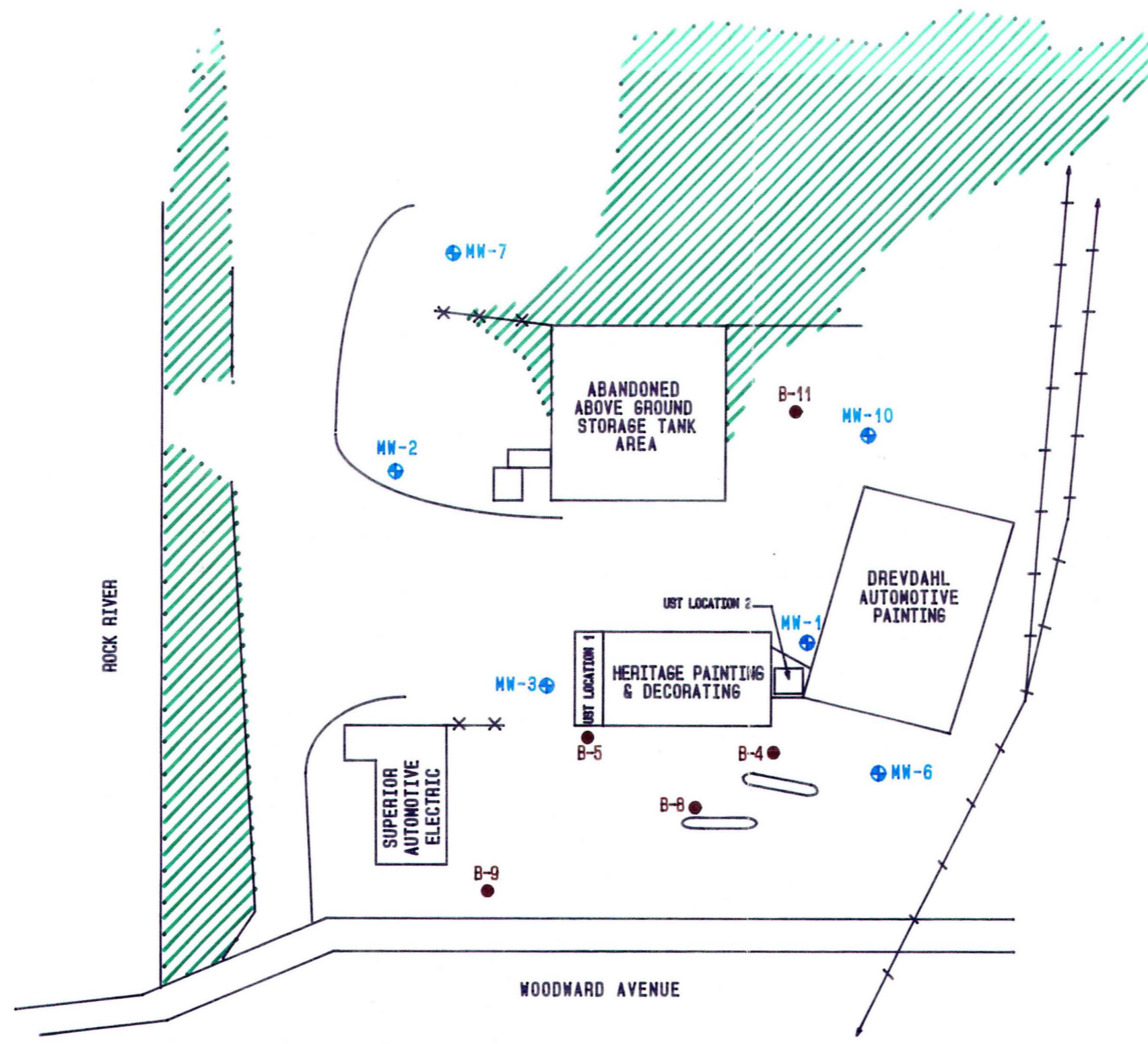
- LEGEND**
- x— FENCE
 - +— ABANDONED RAIL ROAD TRACKS
 - /// HEAVILY VEGETATED AREA

FIGURE 3
 UNDERGROUND STORAGE
 TANK LOCATION MAP
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN



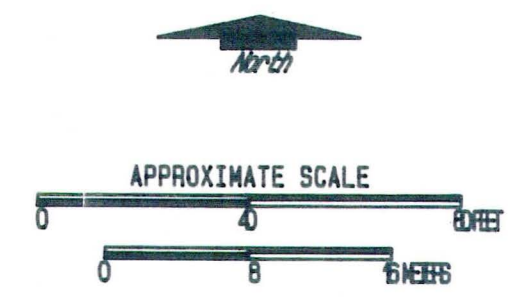
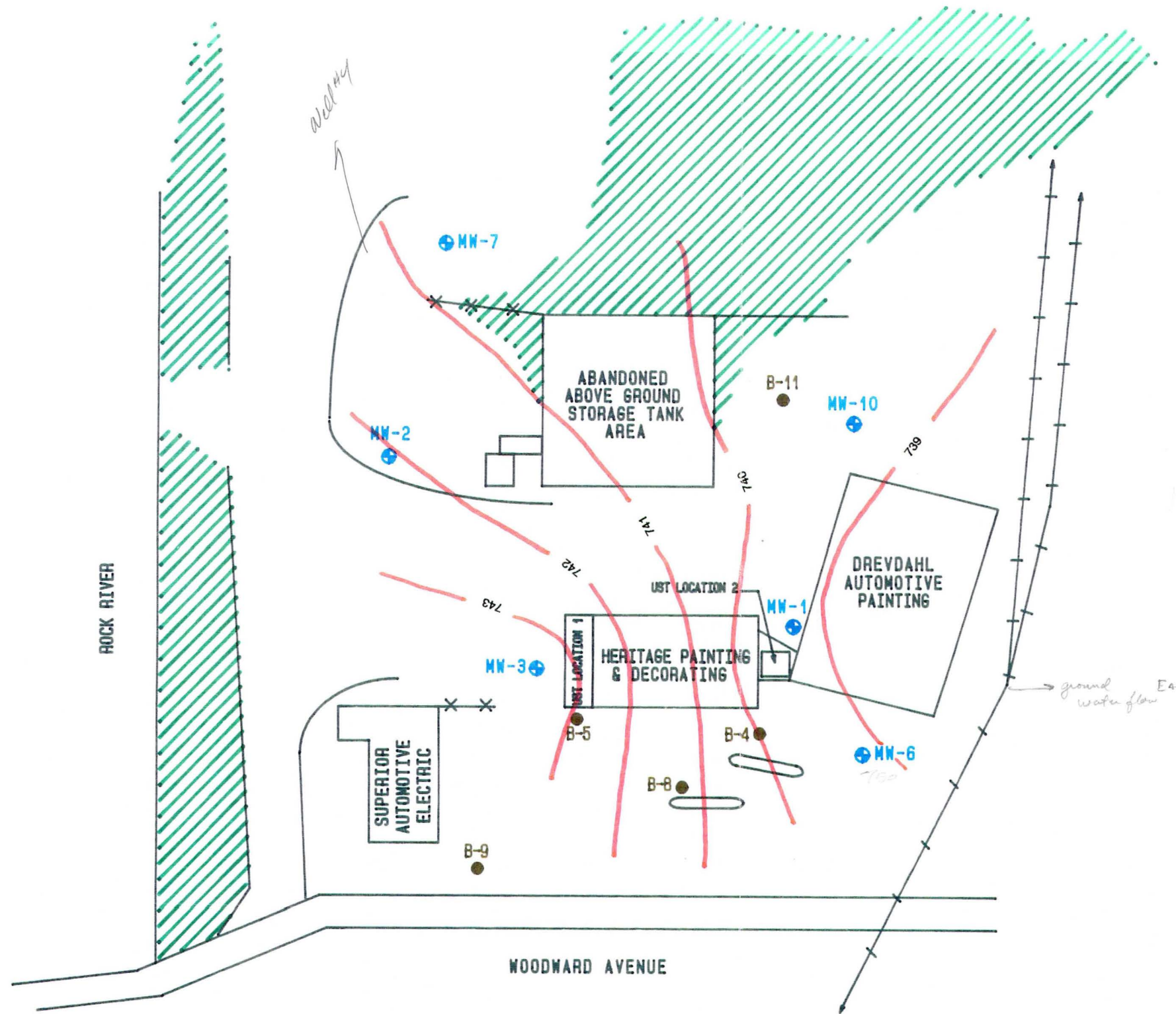
- LEGEND**
- SOIL BORING LOCATION
 - ⊕ MONITORING WELL LOCATION
 - x— FENCE
 - +— ABANDONED RAIL ROAD TRACKS
 - /// HEAVILY VEGETATED AREA

FIGURE 4
 SOIL BORING AND MONITORING
 WELL LOCATION MAP
 SAMPLING LOCATIONS 1 THROUGH 5
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN



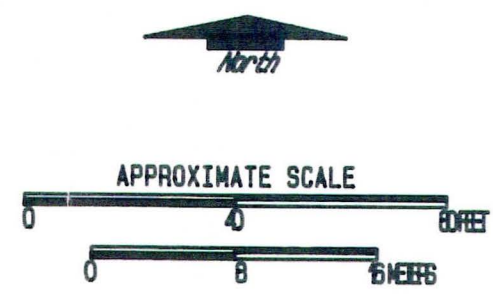
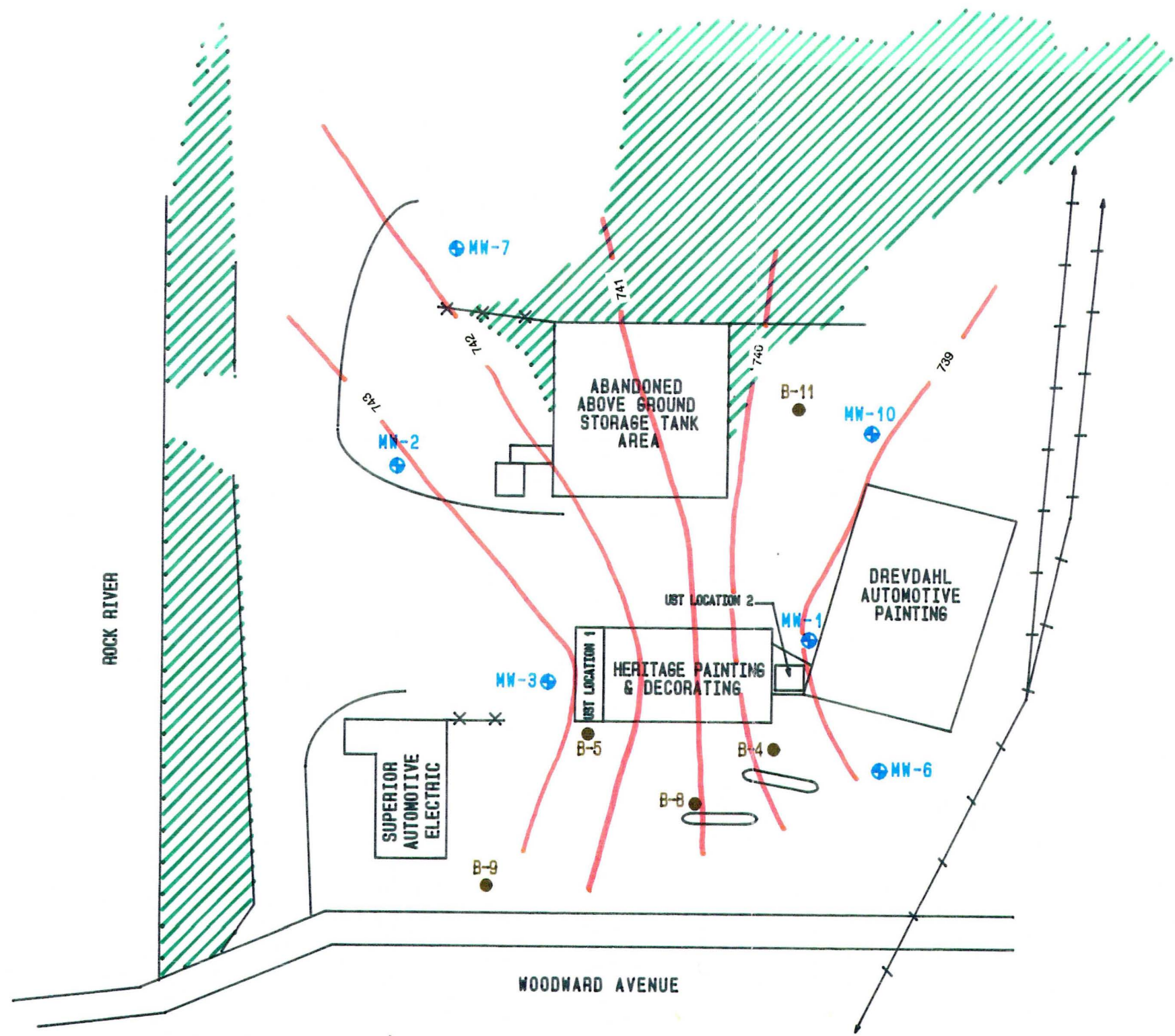
- LEGEND**
- SOIL BORING LOCATION
 - ⊕ MONITORING WELL LOCATION
 - x— FENCE
 - |—|— ABANDONED RAIL ROAD TRACKS
 - /// HEAVILY VEGETATED AREA

FIGURE 5
 SOIL BORING AND MONITORING
 WELL LOCATION MAP
 SAMPLING LOCATIONS 1 THROUGH 11
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN



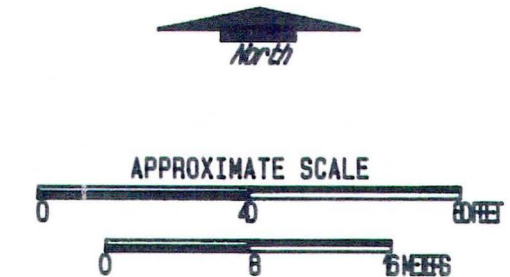
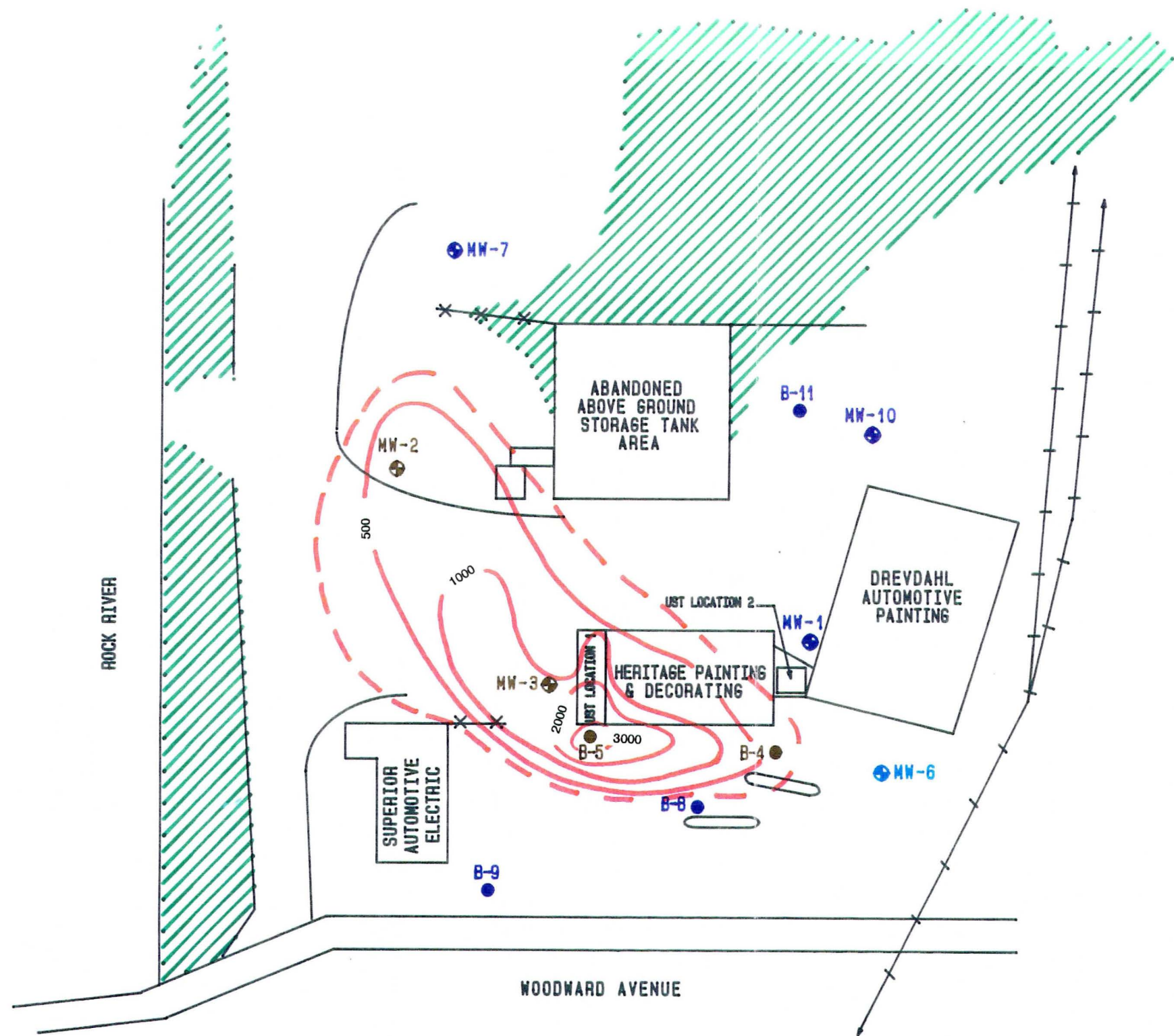
- LEGEND**
- SOIL BORING LOCATION
 - ⊕ MONITORING WELL LOCATION
 - GROUND WATER CONTOURS
 - × FENCE
 - + ABANDONED RAIL ROAD TRACKS
 - /// HEAVILY VEGETATED AREA

FIGURE 6
 GROUND WATER CONTOUR MAP
 JULY 11, 1990
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN



- LEGEND**
- SOIL BORING LOCATION
 - ⊕ MONITORING WELL LOCATION
 - GROUND WATER CONTOURS
 - ✕ FENCE
 - + ABANDONED RAIL ROAD TRACKS
 - /// HEAVILY VEGETATED AREA

FIGURE 7
 GROUND WATER CONTOUR MAP
 JULY 24, 1990
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN

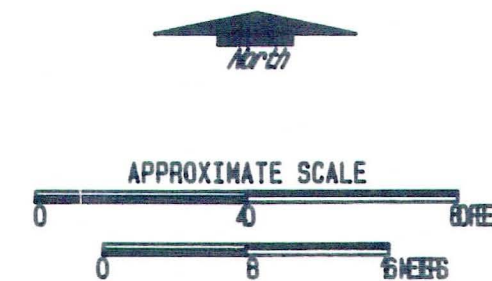
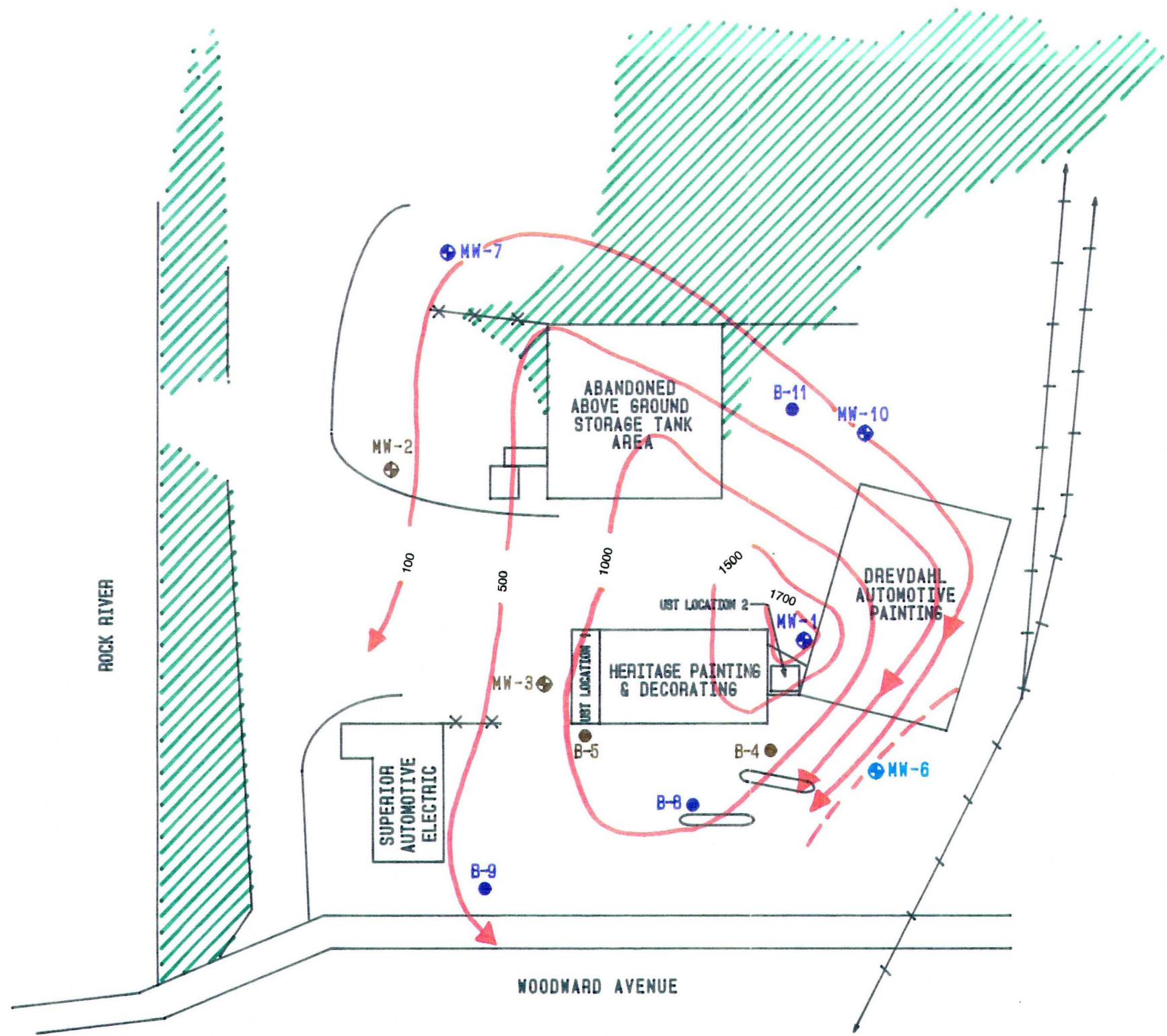


LEGEND

- (brown) SAMPLING LOCATIONS DISPLAYING GASOLINE IMPACT TO SOIL
- (blue) SAMPLING LOCATIONS DISPLAYING DIESEL FUEL IMPACT TO SOIL
- (red) GASOLINE CONCENTRATIONS *
- - - (red) BOUNDARIES OF GASOLINE IMPACT
- X- (black) FENCE
- + (black) ABANDONED RAIL ROAD TRACKS
- /// (green) HEAVILY VEGETATED AREA

* GASOLINE CONTAMINATION AS DETERMINED BY LABORATORY ANALYSIS OF SOIL SAMPLES COLLECTED DURING PHASE I AND PHASE II INVESTIGATIONS. CONCENTRATIONS IN PARTS PER MILLION.

FIGURE 8
GASOLINE IMPACT CONTOUR MAP
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN

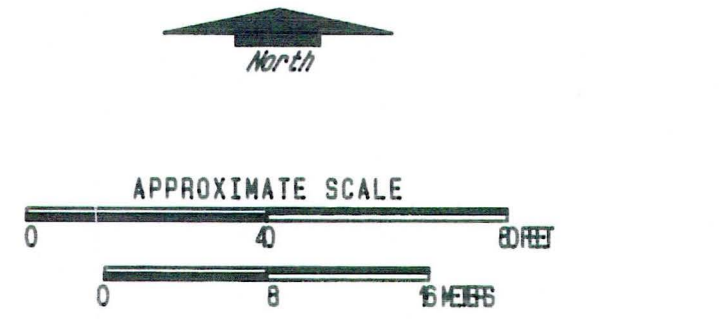
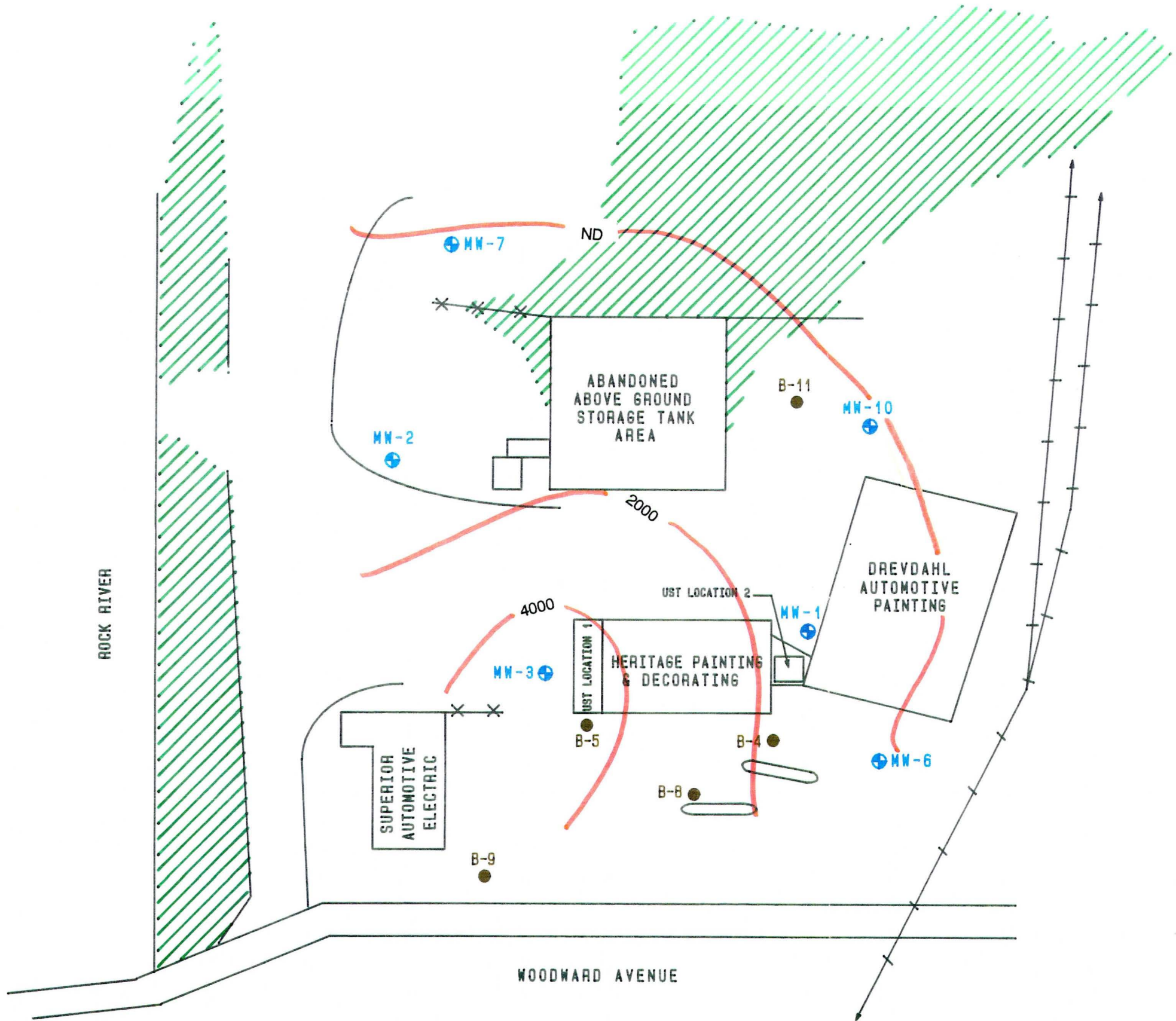


LEGEND

- (with cross) SAMPLING LOCATIONS DISPLAYING GASOLINE IMPACT TO SOIL
- (with dot) SAMPLING LOCATIONS DISPLAYING DIESEL FUEL IMPACT TO SOIL
- (solid red line) DIESEL FUEL CONCENTRATIONS *
- - - (dashed red line) BOUNDARIES OF DIESEL IMPACT
- x - (line with crosses) FENCE
- + - (line with pluses) ABANDONED RAIL ROAD TRACKS
- /// (hatched green) HEAVILY VEGETATED AREA

* DIESEL FUEL CONTAMINATION AS DETERMINED BY LABORATORY ANALYSIS OF SOIL SAMPLES COLLECTED DURING PHASE I AND PHASE II INVESTIGATIONS. CONCENTRATIONS IN PARTS PER MILLION.

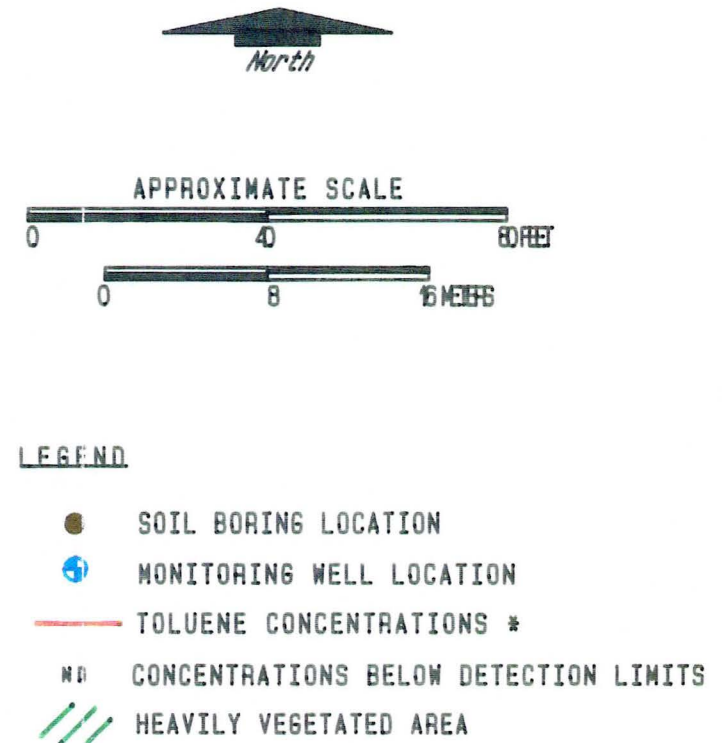
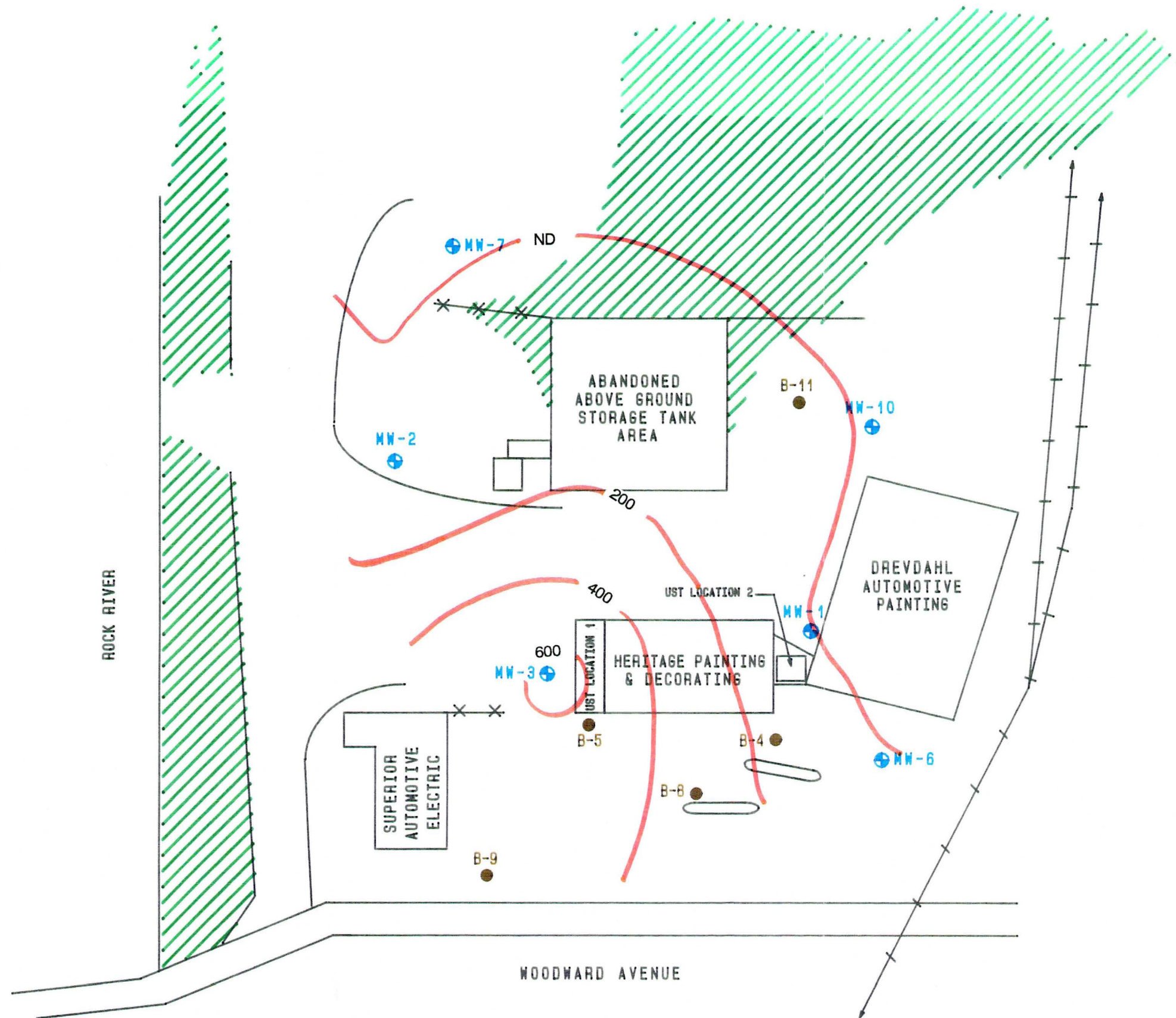
**FIGURE 9
DIESEL FUEL IMPACT
CONTOUR MAP
URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**



- LEGEND**
- SOIL BORING LOCATION
 - ⊕ MONITORING WELL LOCATION
 - BENZENE CONCENTRATIONS *
 - ND CONCENTRATIONS BELOW DETECTION LIMITS
 - /// HEAVILY VEGETATED AREA

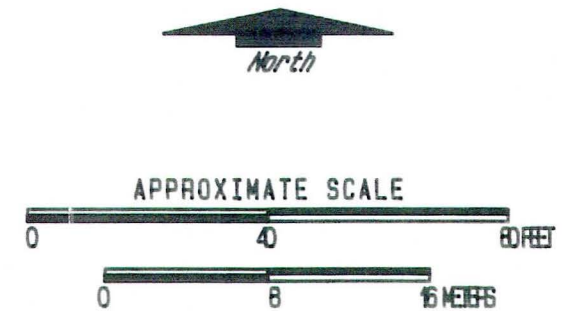
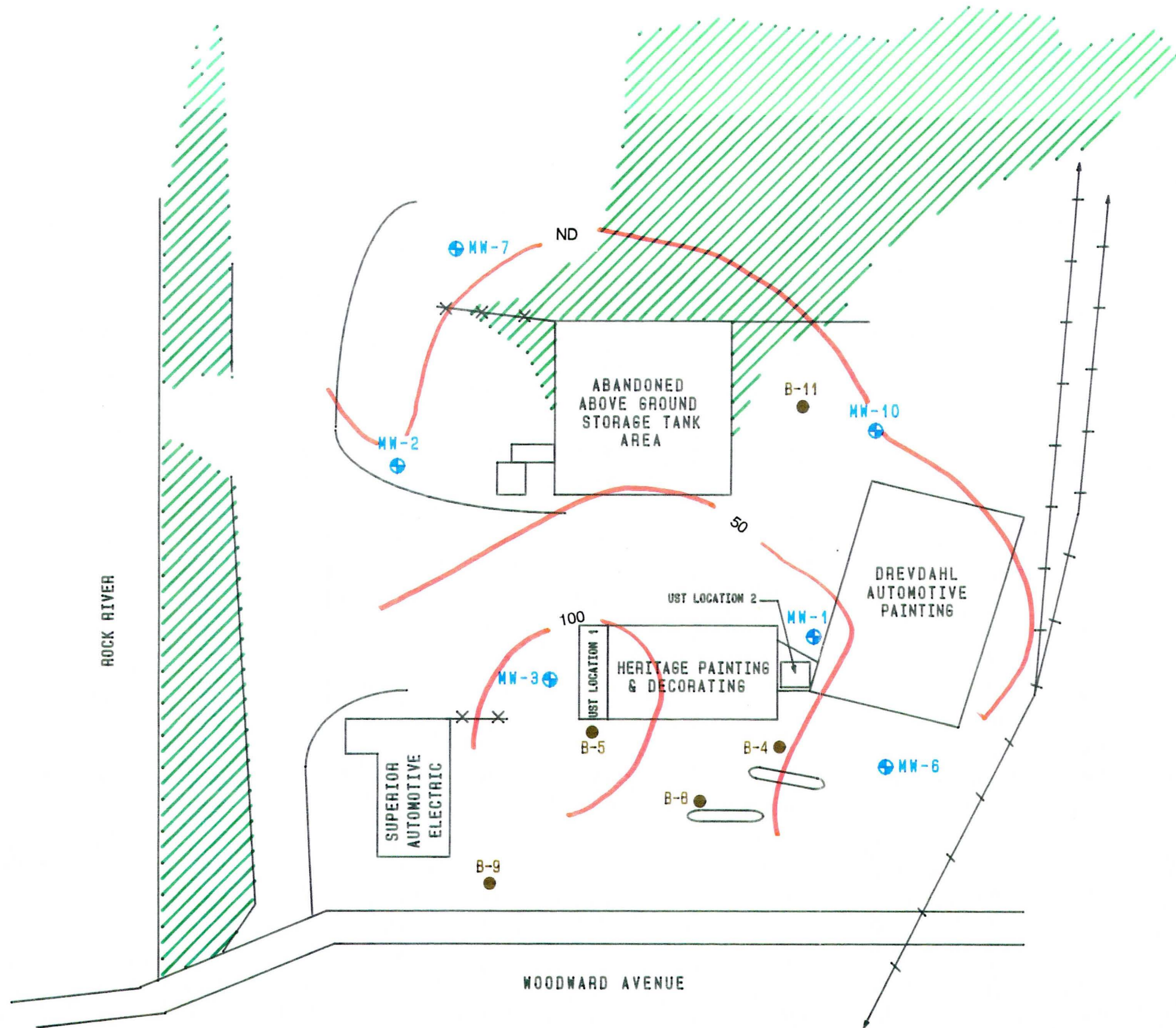
* BTEX CONCENTRATIONS AS DETERMINED BY LABORATORY ANALYSIS OF WATER SAMPLES COLLECTED DURING PHASE I AND PHASE II INVESTIGATIONS. CONCENTRATIONS IN PARTS PER BILLION.

FIGURE 10a
 BENZENE IMPACT TO GROUND WATER
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN



* BTEX CONCENTRATIONS AS DETERMINED BY LABORATORY ANALYSIS OF WATER SAMPLES COLLECTED DURING PHASE I AND PHASE II INVESTIGATIONS. CONCENTRATIONS IN PARTS PER BILLION.

FIGURE 10b
TOLUENE IMPACT TO GROUND WATER
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN



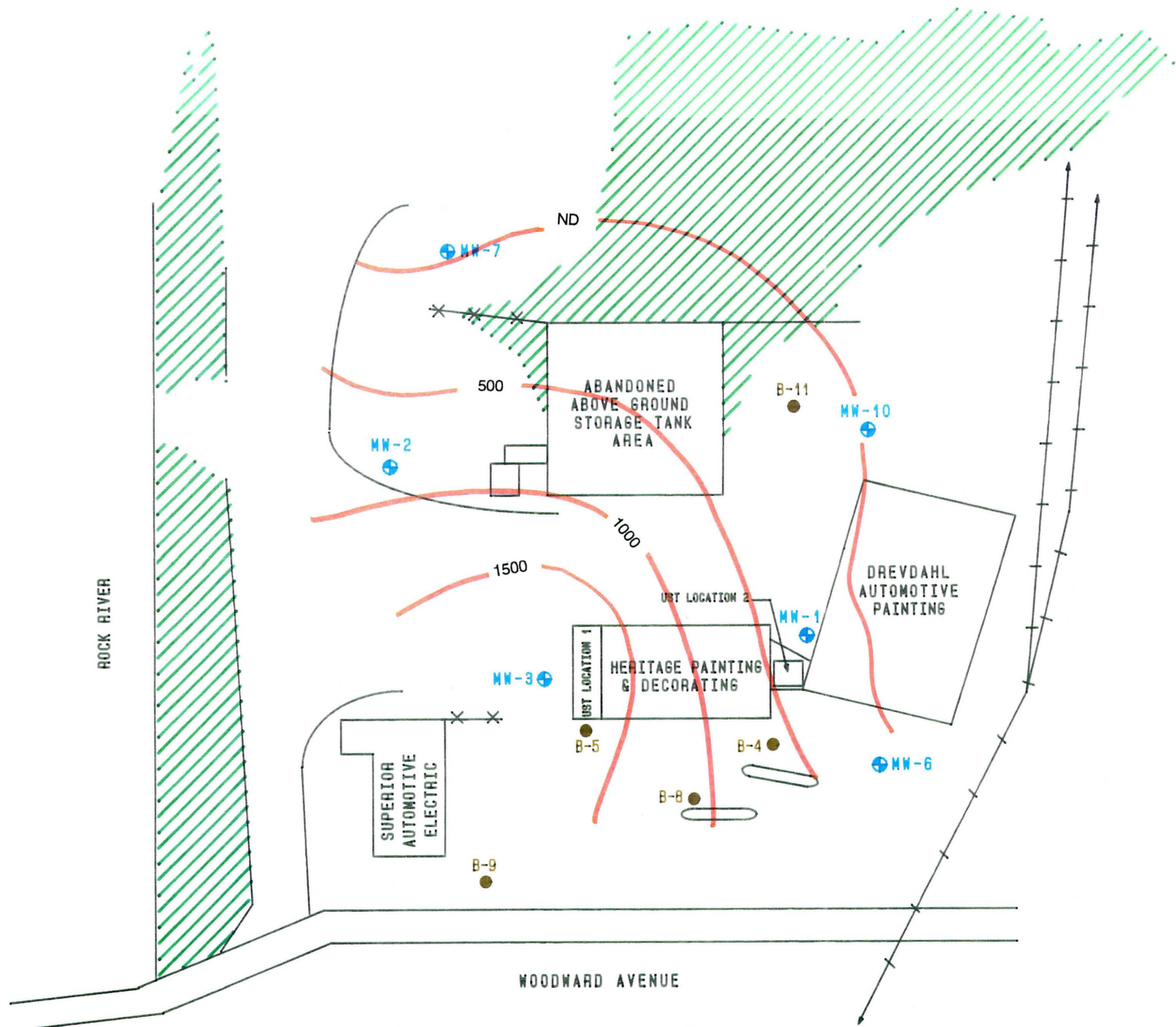
LEGEND

- SOIL BORING LOCATION
- ⊕ MONITORING WELL LOCATION
- ETHYLBENZENE CONCENTRATIONS *
- ND CONCENTRATIONS BELOW DETECTION LIMITS
- /// HEAVILY VEGETATED AREA

* BTEX CONCENTRATIONS AS DETERMINED BY LABORATORY ANALYSIS OF WATER SAMPLES COLLECTED DURING PHASE I AND PHASE II INVESTIGATIONS. CONCENTRATIONS IN PARTS PER BILLION.

FIGURE 10c
ETHYLBENZENE IMPACT TO GROUND WATER

URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN



North

APPROXIMATE SCALE

0 40 80 FEET

0 8 16 METERS

LEGEND

- SOIL BORING LOCATION
- ⊕ MONITORING WELL LOCATION
- XYLENE CONCENTRATIONS *
- ND CONCENTRATIONS BELOW DETECTION LIMITS
- /// HEAVILY VEGETATED AREA

* BTEX CONCENTRATIONS AS DETERMINED BY LABORATORY ANALYSIS OF WATER SAMPLES COLLECTED DURING PHASE I AND PHASE II INVESTIGATIONS. CONCENTRATIONS IN PARTS PER BILLION.

FIGURE 10d
 XYLENE IMPACT TO GROUND WATER
 URSULA BORGERDING ESTATE
 435 WOODWARD AVENUE
 BELOIT, WISCONSIN

APPENDIX A
SOIL BORING LOGS

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: **B-1** OBSERVATION WELL: **MW-1**
 DRILLING CONTRACTOR: **TWIN CITY TESTING CORP.**
 DRILLER: **GARY WELLNER** GEOLOGIST: **KRISTINE STEHR**
 HELPER: **TIM GELICHOWSKI**
 DRILL RIG: **CME 55** START DATE: **MARCH 14, 1990**
 HOLE ADVANCED BY: **H.S. 4 1/4" AUGER** COMPLETION DATE: **MARCH 14, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	7.0'		Oily sheen on wash water and puddled water around spoil. Strong petroleum odor from hole.
After Auger or Casing Pulled	—		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		DEPTH TO CAVED MATERIAL: —	

Sample Number	Blows on Sampler			Sample Recovery	Material Change	MATERIAL CLASSIFICATION	Signature: <i>Kristine M. Stehr</i>	PID (ppm)	COMMENTS
	0-6	6-12	12-18						
	2	3	3	17		1'-2.5'		21.1	Petroleum odor.
	3	3	2	10	5	3.5'-5'		109*	Moist. Strong petroleum odor, bottom 4".
	2	6	8	16		6'-7.5'		20.4	Oily sheen, top 10". Strong petroleum odor. Bottom 6" wet.
	7	7	6	—	10	8.5'-10'		—	No sample recovery.
	1	1	7	9		11'-12.5'		242	Petroleum-saturated soil.
					15				
					20				
					25				
					30				
Boring terminated at 14'									
* Sample submitted for analysis									

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: B-2

OBSERVATION WELL: MW-2

DRILLING CONTRACTOR: TWIN CITY TESTING CORP.

GEOLOGIST: KRISTINE STEHR

DRILLER: GARY WELLNER

HELPER: TIM GELICHOWSKI

DRILL RIG: CME 55

START DATE: MARCH 14, 1990

HOLE ADVANCED BY: H.S. 4 1/4" AUGER

COMPLETION DATE: MARCH 14, 1990

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	2.0'		Oily sheen on wash water and puddled water around spoil. Strong petroleum odor from hole. Two photographs.
After Auger or Casing Pulled	--		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		DEPTH TO CAVED MATERIAL: --	

Sample Number	Blows on Sampler				Sample Recovery	Material Change	MATERIAL CLASSIFICATION	PID (ppm)	COMMENTS
	0-6	6-12	12-18	18-24					
	1	2	2	18			Signature: <i>Kristine M. Stehr</i>		
						1'-2.5'	Top 14": Brown clay, sand and pebble foundry fill. Bottom 4": Black clay, sand and pebble foundry fill.	67.4*	Wet, bottom 6". Heavily saturated soils and free product.
						5'			
						10'	Underlying soils consist of dark brown to black sandy clay, silty sand and pebbles; coarsens with depth; gravel at approximately 11.5'.		
						15'			
						20'			
						25'			
						30'	Boring terminated at 12'		
							* Sample submitted for analysis		

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: **B-4** OBSERVATION WELL: **—**
 DRILLING CONTRACTOR: **TWIN CITY TESTING CORP.**
 DRILLER: **GARY WELLNER** GEOLOGIST: **KRISTINE STEHR**
 HELPER: **TIM GELICHOWSKI**
 DRILL RIG: **CME 55** START DATE: **MARCH 14, 1990**
 HOLE ADVANCED BY: **H.S. 4¼" AUGER** COMPLETION DATE: **MARCH 14, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	10.5'		
After Auger or Casing Pulled	—		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		DEPTH TO CAVED MATERIAL: —	

Sample Number	Blows on Sampler				Sample Recovery	Material Change	MATERIAL CLASSIFICATION	Signature: <i>Kristine Stehr</i>	PID (ppm)	COMMENTS
	0	6	12	18						
							1'-2.5'	No sample recovery.		
	3	5	4	9	5		2.5'-4'	Black sand, silt, clay and pebble foundry fill.	50.1	Slight petroleum odor.
	1	3	5	9			4.5'-6'	Top 2": Black sand, silt, clay and pebble foundry fill. Middle 3": Brown clayey sand. Bottom 4": Black gravelly sand.	5.3	
	1	2	3	8	10		7'-8.5'	Black clayey fine sand.	2.8	
	4	6	6	16			9.5'-11'	Top 6": Brown clayey sand and gravel. Bottom 10": Brown clayey sand.	109*	Slight petroleum odor. Wet, bottom 8'.
					15					
					20					
					25					
					30					
							Boring terminated at 11'			
							* Sample submitted for analysis			

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: **B-5**

OBSERVATION WELL: **--**

DRILLING CONTRACTOR: **TWIN CITY TESTING CORP.**

DRILLER: **GARY WELLNER**

GEOLOGIST: **KRISTINE STEHR**

HELPER: **TIM GELICHOWSKI**

DRILL RIG: **CME 55**

START DATE: **MARCH 14, 1990**

HOLE ADVANCED BY: **H.S. 4 1/4" AUGER**

COMPLETION DATE: **MARCH 14, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	6.5'		Oily sheen on wash water. Strong petroleum odor from hole.
After Auger or Casing Pulled	--		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		DEPTH TO CAVED MATERIAL: --	

Sample Number	Blows on Sampler			Sample Recovery	Material Change	MATERIAL CLASSIFICATION	PID (ppm)	COMMENTS
	0-6	6-12	12-18					
	--	--	--	--		1'-2.5' No sample recovery. Black foundry fill up on augers.		Petroleum-saturated soil.
	1	10	6	15		4'-5.5' Black sand and silt, some pebbles.	658	
	5-							
	1	2	2	6		6.5'-8' Black sand and silt, some pebbles.	377*	Wet. Petroleum odor.
	10-							
	15-							
	20-							
	25-							
	30-							
Boring terminated at 8'								
* Sample submitted for analysis								

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: **B-6**

OBSERVATION WELL: **MW-6**

DRILLING CONTRACTOR: **ENVIRONMENTAL & FOUNDATION DRILLING, INC.**

DRILLER: **BRANDON**

GEOLOGIST: **KRISTINE STEHR**

HELPER: **LONNIE**

DRILL RIG: **CME 55**

START DATE: **JULY 5, 1990**

HOLE ADVANCED BY: **H.S. 4 1/4" AUGER**

COMPLETION DATE: **JULY 5, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	13'		
After Auger or Casing Pulled	--		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		DEPTH TO CAVED MATERIAL: --	

Sample Number	Blows on Sampler				Sample Recovery	Material Change	MATERIAL CLASSIFICATION	Signature: <i>Kristine Stehr</i>	PID (ppm)	COMMENTS
	0-6	6-12	12-18	18-24						
	4	4	3	3			3.5'-5' Gravel - No sample collected.		--	
						5				
	1	1	7	--			6'-7.5' No sample recovery.		--	
	3	6	5	4			7.5'-9' Dark brown and black sandy clay foundry fill.		5.0	Moist.
	5	7	9	8		10	9.5'-11' Brown medium sand and pebbles.		10.8	Moist.
	8	11	13	14			12'-13.5' Brown sand and pebbles, little silt or clay. Dark grey silty sand layer at 7'-8'.		16.2*	Wet, bottom 8'.
	4	5	11	12		15	14.5'-16' Greyish-brown medium and coarse sand and pebbles.		1.6	Wet. Slight petroleum odor.
	4	5	9	12			17'-18.5' Top 6": Greyish-brown medium and coarse sand and pebbles. Bottom 6": Brown medium sand, few pebbles.		1.0	Wet.
						20				
						25				
						30				

Boring terminated at 19'

* Sample submitted for analysis

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: **B-7**

OBSERVATION WELL: **MW-7**

DRILLING CONTRACTOR: **ENVIRONMENTAL & FOUNDATION DRILLING, INC.**

GEOLOGIST: **KRISTINE STEHR**

DRILLER: **BRANDON**

HELPER: **LONNIE**

DRILL RIG: **CME 55**

START DATE: **JULY 5, 1990**

HOLE ADVANCED BY: **H.S. 4 1/4" AUGER**

COMPLETION DATE: **JULY 5, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	4.5'		Oily sheen on wash water.
After Auger or Casing Pulled	--		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		DEPTH TO CAVED MATERIAL: --	

Sample Number	Blows on Sampler				Sample Recovery	Material Change	MATERIAL CLASSIFICATION	Signature: <i>Kristine Stehr</i>	PID (ppm)	COMMENTS
	0	6	12	18						
	5	9	7	13			1'-2.5'		15.7	Foundry glass.
	30	11	3	10	5		3.5'-5'		21	Wet, bottom 5". Petroleum odor.
	wt	1	1	8			6'-7.5'		21.6*	Oily sheen. Strong petroleum odor.
	wt	wt	wt	15	10		8.5'-10'		15.7	Petroleum odor. Organic texture.
	3	3	3	18			11'-12.5'		11.7	Pieces of wood, roots. Moist.
					15					
					20					
					25					
					30					
							Boring terminated at 12'			
							* Sample submitted for analysis			

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: **B-8**

OBSERVATION WELL: —

DRILLING CONTRACTOR: **ENVIRONMENTAL & FOUNDATION DRILLING, INC.**

DRILLER: **BRANDON**

GEOLOGIST: **KRISTINE STEHR**

HELPER: **LONNIE**

DRILL RIG: **CME 55**

START DATE: **JULY 5, 1990**

HOLE ADVANCED BY: **H.S. 4 1/4" AUGER**

COMPLETION DATE: **JULY 5, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	3'		Oily sheen on wash water.
After Auger or Casing Pulled	--		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		DEPTH TO CAVED MATERIAL: --	

Sample Number	Blows on Sampler				Sample Recovery	Material Change	MATERIAL CLASSIFICATION	Signature: <i>Kristine Stehr</i>	PID (ppm)	COMMENTS
	0	6	6	12						
	--	--	--	--			1'-2.5'	No sample recovery.	--	Drove concrete.
	1	1	1	5			3.5'-5'	Top 4": Brown sandy clay and pebbles. Bottom 1": Dark brown silty clay, some fine sand.	57	Wet. Petroleum odor.
	wt	1	1	8	5		6'-7.5'	Dark brown silty clay, some fine sand.	14.4	Wet. Oily sheen on soil. Petroleum odor.
	1	1	1	18			8.5'-10'	Dark brown interbedded sand and organic clay.	1.7*	Wet. Oily sheen on soil. Petroleum odor.
	wt	wt	1	--	10		11'-12.5'	No sample recovery.	--	
	3	6	6	10			13.5'-15'	Greyish-brown fine sand, few pebbles.	2.2	Wet. Oily sheen on soil. Petroleum odor.
					15					
					20					
					25					
					30					
							Boring terminated at 13.5'			
							* Sample submitted for analysis			

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: **B-9** OBSERVATION WELL: —
 DRILLING CONTRACTOR: **ENVIRONMENTAL & FOUNDATION DRILLING, INC.**
 DRILLER: **BRANDON** GEOLOGIST: **KRISTINE STEHR**
 HELPER: **LONNIE**
 DRILL RIG: **CME 55** START DATE: **JULY 6, 1990**
 HOLE ADVANCED BY: **H.S. 4¼" AUGER** COMPLETION DATE: **JULY 6, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	3.5'		Black, oily sheen on wash water.
After Auger or Casing Pulled	—		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		DEPTH TO CAVED MATERIAL: —	

Sample Number	Blows on Sampler			Sample Recovery	Material Change	MATERIAL CLASSIFICATION Signature: <i>Kristine Stehr</i>	PID (ppm)	COMMENTS
	0-6	6-12	12-18					
	3	3	2	8		1'-2.5' Top 3": Concrete spoil. Middle 1": Black foundry fill. Bottom 4": Brown sand and pebbles.	5.5	
	2	2	1	6	5	3.5'-5' Brown sand and pebbles, silty at tip.	60.8	Wet. Petroleum odor.
	3	5	7	4		6'-7.5' Black sand and pebble foundry fill.	128*	Wet. Petroleum odor.
	wt	wt	3	—	10	8.5'-10' Brown sand - No sample recovery.	—	Black water. Oily sheen. Petroleum odor.
	wt	wt	wt	—		11'-12.5' Black organic sandy clay.	8.6	Black water. Oily sheen. Petroleum odor.
					15			
					20			
					25			
					30			
Boring terminated at 8.5'								
* Sample submitted for analysis								

SOIL BORING LOG

URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN

BORING NUMBER: **B-10** OBSERVATION WELL: **MW-10**
 DRILLING CONTRACTOR: **ENVIRONMENTAL & FOUNDATION DRILLING, INC.**
 DRILLER: **BRANDON** GEOLOGIST: **KRISTINE STEHR**
 HELPER: **LONNIE**
 DRILL RIG: **CME 55** START DATE: **JULY 6, 1990**
 HOLE ADVANCED BY: **H.S. 4 1/4" AUGER** COMPLETION DATE: **JULY 6, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	3.5'		Oily sheen on wash water.
After Auger or Casing Pulled	---		
CAVE IN: <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES DEPTH TO CAVED MATERIAL: --			

Sample Number	Blows on Sampler				Sample Recovery	Material Change	Signature: <i>Kristine Stehr</i>	MATERIAL CLASSIFICATION	PID (ppm)	COMMENTS
	0-6	6-12	12-18	18-24						
	5	3	3	10			1'-2.5'	Top 2": Sand and gravel. Bottom 8": Black sand, little clay, pebble foundry fill.	429	Layers of waste paint and paper. Strong solvent odor.
	4	2	4	12	5		3.5'-5'	Black foundry fill and reddish-brown sand.	12.1	Wet, bottom 4". Solvent odor.
	2	3	5	16			6'-7.5'	Dark brown and black sandy clay, some pebbles.	42.5*	Black water. Petroleum odor.
	4	4	2	6			8.5'-10'	Grey medium and fine sand and pebbles.	119	Wet. Oily sheen. Petroleum odor.
					10					
					15					
					20					
					25					
					30					

Boring terminated at 8.5'

* Sample submitted for analysis

SOIL BORING LOG

**URSULA BORGERDING ESTATE
435 WOODWARD AVENUE
BELOIT, WISCONSIN**

BORING NUMBER: **B-11**

OBSERVATION WELL: —

DRILLING CONTRACTOR: **ENVIRONMENTAL & FOUNDATION DRILLING, INC.**

DRILLER: **BRANDON**

GEOLOGIST: **KRISTINE STEHR**

HELPER: **LONNIE**

DRILL RIG: **CME 55**

START DATE: **JULY 6, 1990**

HOLE ADVANCED BY: **H.S. 4¼" AUGER**

COMPLETION DATE: **JULY 6, 1990**

GROUND WATER	DEPTH TO WATER	READING DATE/TIME	OBSERVATIONS
Encountered During Drilling	4.5'		Oily sheen on wash water.
After Auger or Casing Pulled	—		

CAVE IN: NO YES DEPTH TO CAVED MATERIAL: —

Sample Number	Blows on Sampler				Sample Recovery	Material Change	Signature: <i>Kristine Stehr</i>	MATERIAL CLASSIFICATION	PID (ppm)	COMMENTS
	0	6	12	18						
	2	3	4	12			1'-2.5'	Top 11": Brown sand and pebbles. Bottom 1": Black sand and pebble foundry fill.	15.2	
	2	4	8	8		5	3.5'-5'	Dark brown to black medium and coarse sand and pebble foundry fill.	9.1	Wet, bottom 5". Petroleum odor.
	1	1	1	13			6'-7.5'	Black organic sandy clay, few pebbles.	13.6*	Wet. Oily sheen on soil. Petroleum odor.
	3	5	5	3		10	8.5'-10'	Black clayey sand, few pebbles - No sample collected.	—	Wet. Oily sheen on soil. Petroleum odor.
						15				
						20				
						25				
						30				
							Boring terminated at 8.5'			
							* Sample submitted for analysis			

APPENDIX B
WELL CONSTRUCTION LOGS

Facility/Project Name <u>USULA BORGERDING</u> <u>COLD SPRING RESOURCES</u> Facility License, Permit or Monitoring Number _____	Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-1 Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location <u>NE 1/4 of NE 1/4 of Section 55</u> T <u>1</u> N, R <u>12</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Date Well Installed <u>03/14/90</u> m m d d y y
Distance Well Is From Waste/Source Boundary _____ ft.	Location of Well Relative to Waste/Source <input type="checkbox"/> Upgradient <input type="checkbox"/> Sidegradient <input type="checkbox"/> Downgradient <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) <u>GARY WELLNER</u> <u>TWIN CITY TESTING CORP.</u>
Is Well A Point of Enforcement Stud. Application? <input type="checkbox"/> Yes <input type="checkbox"/> No		

A. Protective pipe, top elevation _____ ft. MSL B. Well casing, top elevation <u>98.82</u> ft. MSL C. Land surface elevation <u>95.77</u> ft. MSL D. Surface seal, bottom _____ ft. MSL or <u>1.0</u> ft.		1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>7.0</u> ft. c. Material: Steel <input checked="" type="checkbox"/> / 04 Other <input type="checkbox"/> d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____ 3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/> 4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input checked="" type="checkbox"/> Other <input type="checkbox"/> 5. Annular space seal: Granular Bentonite <input checked="" type="checkbox"/> 33 _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 _____ Lbs/gal mud weight Bentonite slurry <input type="checkbox"/> 31 _____ % Bentonite Bentonite-cement grout <input type="checkbox"/> 50 <u>0.19</u> Ft ³ volume added for any of the above How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08 6. Bentonite seal: Bentonite granules <input type="checkbox"/> 33 <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 NONE _____ Other <input type="checkbox"/> 7. Fine sand material: Manufacturer, product name and mesh size <u>ARCO, #9099 SILICA SAND</u> Volume added <u>0.096</u> ft ³ 8. Filter pack material: Manufacturer, product name and mesh size <u>RED FLINT, #30 FLINT SAND</u> Volume added <u>2.22</u> ft ³ 9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 _____ Other <input type="checkbox"/> 10. Screen material: <u>FLUSH THREADED PVC SCHED. 40</u> Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 _____ Other <input type="checkbox"/> Manufacturer <u>MONOFLEX, INC.</u> Slot size: <u>0.010</u> in. Slotted length: <u>10.0</u> ft. 11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> _____ Other <input type="checkbox"/>
12. USCS classification of soil near screen: <input type="checkbox"/> GP <input type="checkbox"/> GM <input type="checkbox"/> CC <input type="checkbox"/> GW <input type="checkbox"/> SW <input checked="" type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock 13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 _____ Other <input type="checkbox"/> 15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99 16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe _____ 17. Source of water (attach analysis): _____		
E. Bentonite seal, top _____ ft. MSL or <u>1.0</u> ft. F. Fine sand, top _____ ft. MSL or <u>2.0</u> ft. G. Filter pack, top _____ ft. MSL or <u>2.5</u> ft. H. Well screen, top _____ ft. MSL or <u>4.0</u> ft. I. Well screen, bottom _____ ft. MSL or <u>13.0</u> ft. J. Filter pack, bottom _____ ft. MSL or <u>14.0</u> ft. K. Borehole, bottom _____ ft. MSL or <u>14.0</u> ft. L. Borehole, diameter <u>8.0</u> in. M. O.D. well casing <u>2.25</u> in. N. I.D. well casing <u>2.00</u> in.		

I hereby certify that the information on this form is true and correct to the best of my knowledge.
 Signature [Signature] Firm TWIN CITY TESTING CORPORATION

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

Facility/Project Name <i>Wiscota Recycling Estate</i>	Well Name <i>D-1/1111-1</i>	
License, Permit or Monitoring Number -----	Wis. Unique Well Number -----	DNR Well Number -----

<p>1. Can this well be purged dry? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>2. Well development method</p> <table style="width:100%; border: none;"> <tr><td style="padding: 2px;">surged with bailer and bailed</td><td style="text-align: right; padding: 2px;"><input checked="" type="checkbox"/> 4 1</td></tr> <tr><td style="padding: 2px;">surged with bailer and pumped</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> 6 1</td></tr> <tr><td style="padding: 2px;">surged with block and bailed</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> 4 2</td></tr> <tr><td style="padding: 2px;">surged with block and pumped</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> 6 2</td></tr> <tr><td style="padding: 2px;">surged with block, bailed and pumped</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> 7 0</td></tr> <tr><td style="padding: 2px;">compressed air</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> 2 0</td></tr> <tr><td style="padding: 2px;">bailed only</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> 1 0</td></tr> <tr><td style="padding: 2px;">pumped only</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> 5 1</td></tr> <tr><td style="padding: 2px;">pumped slowly</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> 5 0</td></tr> <tr><td style="padding: 2px;">Other _____</td><td style="text-align: right; padding: 2px;"><input type="checkbox"/> </td></tr> </table> <p>3. Time spent developing well _____ min.</p> <p>4. Depth of well (from top of well casing) <u>13.4</u> ft.</p> <p>5. Inside diameter of well <u>0.18</u> in.</p> <p>6. Volume of water in filter pack and well casing <u>1.2</u> gal.</p> <p>7. Volume of water removed from well <u>10</u> gal.</p> <p>8. Volume of water added (if any) <u>0</u> gal.</p> <p>9. Source of water added _____</p> <p>10. Analysis performed on water added? <input type="checkbox"/> Yes <input type="checkbox"/> No (If yes, attach results)</p>	surged with bailer and bailed	<input checked="" type="checkbox"/> 4 1	surged with bailer and pumped	<input type="checkbox"/> 6 1	surged with block and bailed	<input type="checkbox"/> 4 2	surged with block and pumped	<input type="checkbox"/> 6 2	surged with block, bailed and pumped	<input type="checkbox"/> 7 0	compressed air	<input type="checkbox"/> 2 0	bailed only	<input type="checkbox"/> 1 0	pumped only	<input type="checkbox"/> 5 1	pumped slowly	<input type="checkbox"/> 5 0	Other _____	<input type="checkbox"/> 	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th style="width:35%;">Before Development</th> <th style="width:35%;">After Development</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">11. Depth to Water (from top of well casing)</td> <td style="text-align: center; padding: 5px;"><u>12.20</u> ft.</td> <td style="text-align: center; padding: 5px;">----- ft.</td> </tr> <tr> <td style="padding: 5px;">Date</td> <td style="text-align: center; padding: 5px;"><u>03/15/90</u> m m d d y y</td> <td style="text-align: center; padding: 5px;"><u>03/15/90</u> m m d d y y</td> </tr> <tr> <td style="padding: 5px;">Time</td> <td style="text-align: center; padding: 5px;"><u>08:15</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.</td> <td style="text-align: center; padding: 5px;"><u>02:05</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.</td> </tr> <tr> <td style="padding: 5px;">12. Sediment in well bottom</td> <td style="text-align: center; padding: 5px;">----- inches</td> <td style="text-align: center; padding: 5px;">----- inches</td> </tr> <tr> <td style="padding: 5px;">13. Water clarity</td> <td style="padding: 5px;">Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 25 (Describe) <i>Several min. at a time then back for 30 min to recharge</i></td> <td style="padding: 5px;">Clear <input checked="" type="checkbox"/> 10 Turbid <input type="checkbox"/> 25 (Describe) <i>Clear after 10 min. 460's purged</i></td> </tr> <tr> <td colspan="3" style="padding: 5px;">Fill in if drilling fluids were used and well is at solid waste facility:</td> </tr> <tr> <td style="padding: 5px;">14. Total suspended solids</td> <td style="text-align: center; padding: 5px;">----- mg/l</td> <td style="text-align: center; padding: 5px;">----- mg/l</td> </tr> <tr> <td style="padding: 5px;">15. COD</td> <td style="text-align: center; padding: 5px;">----- mg/l</td> <td style="text-align: center; padding: 5px;">----- mg/l</td> </tr> </tbody> </table>		Before Development	After Development	11. Depth to Water (from top of well casing)	<u>12.20</u> ft.	----- ft.	Date	<u>03/15/90</u> m m d d y y	<u>03/15/90</u> m m d d y y	Time	<u>08:15</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	<u>02:05</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	12. Sediment in well bottom	----- inches	----- inches	13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 25 (Describe) <i>Several min. at a time then back for 30 min to recharge</i>	Clear <input checked="" type="checkbox"/> 10 Turbid <input type="checkbox"/> 25 (Describe) <i>Clear after 10 min. 460's purged</i>	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
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Additional comments on development:

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>Kristine M. Gehr</u>	Signature: <u>Kristine M. Gehr</u>
Firm: <u>Dunes & Moore, Ltd.</u>	Firm: <u>Dunes & Moore, Ltd.</u>

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

Facility/Project Name <u>URSULA BORGERDING</u> <u>COLD SPRING RESOURCES</u> Facility License, Permit or Monitoring Number _____	Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-2 Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location <u>NE 1/4 of NE 1/4 of Section 35</u> T <u>1</u> N, R <u>13</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Date Well Installed <u>03 / 14 / 90</u> Well Installed By: (Person's Name and Firm) GARY WELLNER
Distance Well Is From Waste/Source Boundary _____ ft.	Location of Well Relative to Waste/Source <input type="checkbox"/> Upgradient <input type="checkbox"/> Sidegradient <input type="checkbox"/> Downgradient <input type="checkbox"/> Not Known	TWIN CITY TESTING CORP.
Is Well A Point of Enforcement Std. Application? <input type="checkbox"/> Yes <input type="checkbox"/> No		

A. Protective pipe, top elevation _____ ft. MSL B. Well casing, top elevation <u>97.9</u> ft. MSL C. Land surface elevation <u>95.17</u> ft. MSL D. Surface seal, bottom _____ ft. MSL or <u>7</u> ft.		1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>7.0</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/> _____ d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____ 3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/> _____ 4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input checked="" type="checkbox"/> _____ Other <input type="checkbox"/> _____ 5. Annular space seal: Granular Bentonite <input checked="" type="checkbox"/> 33 _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 _____ Lbs/gal mud weight . . . Bentonite slurry <input type="checkbox"/> 31 _____ % Bentonite . . . Bentonite-cement grout <input type="checkbox"/> 50 <u>0.096</u> Ft ³ volume added for any of the above How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08 6. Bentonite seal: Bentonite granules <input type="checkbox"/> 33 <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 NONE Other <input type="checkbox"/> _____ 7. Fine sand material: Manufacturer, product name and mesh size <u>ARCO, #9099 SILICA SAND</u> Volume added <u>0.06</u> ft ³ 8. Filter pack material: Manufacturer, product name and mesh size <u>RED FLINT #30 FLINT SAND</u> Volume added <u>2.03</u> ft ³ 9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/> _____ 10. Screen material: <u>FLUSH TREADED PVC SCHED. 40</u> Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/> _____ Manufacturer <u>MONOFLEX, INC.</u> Slot size: <u>0.010</u> in. Slotted length: <u>10.0</u> ft. 11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> Other <input type="checkbox"/> _____
12. USCS classification of soil near screen: <input type="checkbox"/> GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input checked="" type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock 13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/> _____ 15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99 16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe _____ 17. Source of water (attach analysis): _____	E. Bentonite seal, top _____ ft. MSL or <u>7</u> ft. F. Fine sand, top _____ ft. MSL or <u>1.2</u> ft. G. Filter pack, top _____ ft. MSL or <u>1.5</u> ft. H. Well screen, top _____ ft. MSL or <u>2.0</u> ft. I. Well screen, bottom _____ ft. MSL or <u>12.0</u> ft. J. Filter pack, bottom _____ ft. MSL or <u>12.0</u> ft. K. Borehole, bottom _____ ft. MSL or <u>12.0</u> ft. L. Borehole, diameter <u>8.0</u> in. M. O.D. well casing <u>2.25</u> in. N. I.D. well casing <u>2.00</u> in.	

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

Signature Mark A. Muehlenberg Firm TWIN CITY TESTING CORPORATION

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 \$1,000 for each day of violation.

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

Facility/Project Name <u>Muskegon Recycling Estate</u>	Well Name <u>03115140-0</u>	
License, Permit or Monitoring Number -----	Wis. Unique Well Number -----	DNR Well Number -----

<p>1. Can this well be purged dry? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>2. Well development method</p> <p style="padding-left: 20px;">surged with bailer and bailed <input checked="" type="checkbox"/> 4 1</p> <p style="padding-left: 20px;">surged with bailer and pumped <input type="checkbox"/> 6 1</p> <p style="padding-left: 20px;">surged with block and bailed <input type="checkbox"/> 4 2</p> <p style="padding-left: 20px;">surged with block and pumped <input type="checkbox"/> 6 2</p> <p style="padding-left: 20px;">surged with block, bailed and pumped <input type="checkbox"/> 7 0</p> <p style="padding-left: 20px;">compressed air <input type="checkbox"/> 2 0</p> <p style="padding-left: 20px;">bailed only <input type="checkbox"/> 1 0</p> <p style="padding-left: 20px;">pumped only <input type="checkbox"/> 5 1</p> <p style="padding-left: 20px;">pumped slowly <input type="checkbox"/> 5 0</p> <p style="padding-left: 20px;">Other _____ <input type="checkbox"/> </p> <p>3. Time spent developing well _____ min.</p> <p>4. Depth of well (from top of well casing) <u>12.9</u> ft.</p> <p>5. Inside diameter of well <u>0.18</u> in.</p> <p>6. Volume of water in filter pack and well casing <u>4.0</u> gal.</p> <p>7. Volume of water removed from well <u>35</u> gal.</p> <p>8. Volume of water added (if any) _____ gal.</p> <p>9. Source of water added _____</p> <p>10. Analysis performed on water added? <input type="checkbox"/> Yes <input type="checkbox"/> No (If yes, attach results)</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:30%;"></th> <th style="width:35%;">Before Development</th> <th style="width:35%;">After Development</th> </tr> </thead> <tbody> <tr> <td>11. Depth to Water (from top of well casing)</td> <td style="text-align: center;"><u>8.25</u> ft.</td> <td style="text-align: center;">----- ft.</td> </tr> <tr> <td>Date</td> <td style="text-align: center;"><u>03/15/90</u> m m d d y y</td> <td style="text-align: center;"><u>03/15/90</u> m m d d y y</td> </tr> <tr> <td>Time</td> <td style="text-align: center;"><u>02:35</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.</td> <td style="text-align: center;"><u>02:35</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.</td> </tr> <tr> <td>12. Sediment in well bottom</td> <td style="text-align: center;">----- inches</td> <td style="text-align: center;">----- inches</td> </tr> <tr> <td>13. Water clarity</td> <td>Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>kept brackish to clear 14W-1</u></td> <td>Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) <u>clear after pumping several</u></td> </tr> <tr> <td colspan="3">Fill in if drilling fluids were used and well is at solid waste facility:</td> </tr> <tr> <td>14. Total suspended solids</td> <td style="text-align: center;">----- mg/l</td> <td style="text-align: center;">----- mg/l</td> </tr> <tr> <td>15. COD</td> <td style="text-align: center;">----- mg/l</td> <td style="text-align: center;">----- mg/l</td> </tr> </tbody> </table>		Before Development	After Development	11. Depth to Water (from top of well casing)	<u>8.25</u> ft.	----- ft.	Date	<u>03/15/90</u> m m d d y y	<u>03/15/90</u> m m d d y y	Time	<u>02:35</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<u>02:35</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	12. Sediment in well bottom	----- inches	----- inches	13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>kept brackish to clear 14W-1</u>	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) <u>clear after pumping several</u>	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
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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	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>Kristine M. Stehr</u>	Signature: <u>Kristine M. Stehr</u>
Firm: <u>Dames & Moore, Ltd.</u>	Firm: <u>Dames & Moore, Ltd.</u>

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

Facility/Project Name URSULA BORGERDING COLD SPRING RESOURCES		Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		Well Name MW-3	
Facility License, Permit or Monitoring Number _____		Section Location NE 1/4 of NE 1/4 of Section 35		Wis. Unique Well Number _____ DNR Well Number _____	
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12		Date Well Installed 0 3 / 14 / 90 m m / d d / y y		Well Installed By: (Person's Name and Firm) GARY WELLNER	
Distance Well Is From Waste/Source Boundary _____ ft.		Location of Well Relative to Waste/Source T <u>1</u> N, R <u>12</u> E <input type="checkbox"/> W <input type="checkbox"/> Upgradient <input type="checkbox"/> Sidegradient <input type="checkbox"/> Downgradient <input type="checkbox"/> Not Known		TWIN CITY TESTING CORP.	
Is Well A Point of Enforcement Std. Application? <input type="checkbox"/> Yes <input type="checkbox"/> No					

<p>A. Protective pipe, top elevation _____ ft. MSL</p> <p>B. Well casing, top elevation <u>98.11</u> ft. MSL</p> <p>C. Land surface elevation <u>96.17</u> ft. MSL</p> <p>D. Surface seal, bottom _____ ft. MSL or <u>1.0</u> ft.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>12. USCS classification of soil near screen: <input type="checkbox"/> GP <input type="checkbox"/> GM <input type="checkbox"/> CC <input type="checkbox"/> GW <input type="checkbox"/> SW <input checked="" type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock</p> <p>13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/> _____</p> <p>15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99</p> <p>16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Describe _____</p> <p>17. Source of water (attach analysis): _____</p> </div> <p>E. Bentonite seal, top _____ ft. MSL or <u>1.0</u> ft.</p> <p>F. Fine sand, top _____ ft. MSL or <u>2.0</u> ft.</p> <p>G. Filter pack, top _____ ft. MSL or <u>2.5</u> ft.</p> <p>H. Well screen, top _____ ft. MSL or <u>3.0</u> ft.</p> <p>I. Well screen, bottom _____ ft. MSL or <u>13.0</u> ft.</p> <p>J. Filter pack, bottom _____ ft. MSL or <u>13.0</u> ft.</p> <p>K. Borehole, bottom _____ ft. MSL or <u>13.0</u> ft.</p> <p>L. Borehole, diameter <u>8.0</u> in.</p> <p>M. O.D. well casing <u>2.25</u> in.</p> <p>N. I.D. well casing <u>2.00</u> in.</p>		<p>1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>7.0</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/> _____ d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____</p> <p>3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/> _____</p> <p>4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input checked="" type="checkbox"/> _____ Other <input type="checkbox"/> _____</p> <p>5. Annular space seal: Granular Bentonite <input checked="" type="checkbox"/> 33 ____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 ____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 ____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 <u>0.19</u> Ft³ volume added for any of the above How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08</p> <p>6. Bentonite seal: Bentonite granules <input type="checkbox"/> 33 <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 NONE Other <input type="checkbox"/> _____</p> <p>7. Fine sand material: Manufacturer, product name and mesh size <u>ARCO, #9099 SILICA SAND</u> Volume added <u>0.096</u> ft³</p> <p>8. Filter pack material: Manufacturer, product name and mesh size <u>RED FLINT, #30 FLINT SAND</u> Volume added <u>2.03</u> ft³</p> <p>9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/> _____</p> <p>10. Screen material: <u>FLUSH THREADED PVC SCHED. 40</u> Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/> _____ Manufacturer <u>MONOFLEX, INC.</u> Slot size: <u>0.010</u> in. Slotted length: <u>10.0</u> ft.</p> <p>11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> Other <input type="checkbox"/> _____</p>
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I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature _____ Firm **TWIN CITY TESTING CORPORATION**

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.

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

Facility/Project Name <u>Missile Boundary Estate</u>		Well Name <u>B-11113</u>	
License, Permit or Monitoring Number -----		Wis. Unique Well Number -----	DNR Well Number -----

<p>1. Can this well be purged dry? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>2. Well development method</p> <p> surged with bailer and bailed <input checked="" type="checkbox"/> 4 1</p> <p> surged with bailer and pumped <input type="checkbox"/> 6 1</p> <p> surged with block and bailed <input type="checkbox"/> 4 2</p> <p> surged with block and pumped <input type="checkbox"/> 6 2</p> <p> surged with block, bailed and pumped <input type="checkbox"/> 7 0</p> <p> compressed air <input type="checkbox"/> 2 0</p> <p> bailed only <input type="checkbox"/> 1 0</p> <p> pumped only <input type="checkbox"/> 5 1</p> <p> pumped slowly <input type="checkbox"/> 5 0</p> <p> Other _____ <input type="checkbox"/> _____</p> <p>3. Time spent developing well _____ min.</p> <p>4. Depth of well (from top of well casing) <u>12.7</u> ft.</p> <p>5. Inside diameter of well <u>0.18</u> in.</p> <p>6. Volume of water in filter pack and well casing <u>6.7</u> gal.</p> <p>7. Volume of water removed from well <u>50</u> gal.</p> <p>8. Volume of water added (if any) _____ gal.</p> <p>9. Source of water added _____</p> <p>10. Analysis performed on water added? <input type="checkbox"/> Yes <input type="checkbox"/> No (If yes, attach results)</p>	<p>11. Depth to Water (from top of well casing) _____ ft.</p> <p> Date <u>03/15/90</u> m m d d y y</p> <p> Time <u>11:45</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.</p> <p>12. Sediment in well bottom _____ inches</p> <p>13. Water clarity</p> <p> Clear <input type="checkbox"/> 10 Clear <input checked="" type="checkbox"/> 20</p> <p> Turbid <input checked="" type="checkbox"/> 15 Turbid <input type="checkbox"/> 25</p> <p> (Describe) (Describe)</p> <p> <u>kept breaking</u> <u>clear to 10 gal's</u> <u>to bail m.w.-1</u> <u>purged</u> <u>15 gal's, about</u> <u>clear</u></p> <p>Fill in if drilling fluids were used and well is at solid waste facility:</p> <p>14. Total suspended solids _____ mg/l</p> <p>15. COD _____ mg/l</p>

Well developed by: Person's Name and Firm		I hereby certify that the above information is true and correct to the best of my knowledge.	
Name:	<u>Terrie M. Slier</u>	Signature:	<u>Terrie M. Slier</u>
Firm:	<u>Davis & Moore, Inc.</u>	Firm:	<u>Davis & Moore, Inc.</u>

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

Facility/Project Name <u>Dorjeading Estate</u>	Grid Location ft. <input type="checkbox"/> N. <input type="checkbox"/> S. ft. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name <u>MW-6</u>
Facility License, Permit or Monitoring Number		Wis. Unique Well Number DNR Well Number
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location <u>NE 1/4 of NE 1/4 of Section 35</u>	Date Well Installed <u>07.10.51.96</u> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	T / N. R. <u>12</u> A: <input type="checkbox"/> W	Well Installed By: (Person's Name and Firm) <u>Brandon Brandon</u> <u>Environmental Foundation</u>
Is Well A Point of Enforcement Sub. Application? <input type="checkbox"/> Yes <input type="checkbox"/> No	Location of Well Relative to Waste/Source <input type="checkbox"/> Upgradient <input type="checkbox"/> Sidegradient <input type="checkbox"/> Downgradient <input type="checkbox"/> Not Known	

A. Protective pipe, top elevation ----- ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <u>49.09</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>4</u> in. b. Length: <u>2</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <u>97.25</u> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom ----- ft. MSL or <u>7</u> ft.	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: <input type="checkbox"/> GP <input type="checkbox"/> GM <input type="checkbox"/> CC <input type="checkbox"/> GW <input type="checkbox"/> SW <input checked="" type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input checked="" type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: Granular Bentonite <input checked="" type="checkbox"/> 33 ____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 ____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 ____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 <u>0.88</u> ft ³ volume added for any of the above
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	6. Bentonite seal: Bentonite granules <input type="checkbox"/> 33 <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 <u>None</u> Other <input type="checkbox"/>
16. Drilling additives used? <input type="checkbox"/> Yes <input type="checkbox"/> No	7. Fine sand material: Manufacturer, product name and mesh size <u>ARCO #9090 SLICED SAND</u> Volume added <u>4.2</u> ft ³
Describe _____	8. Filter pack material: Manufacturer, product name and mesh size <u>RED FLINT #30 FLINT SAND</u> Volume added <u>0.39</u> ft ³
17. Source of water (attach analysis):	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top ----- ft. MSL or <u>3.0</u> ft.	10. Screen material: <u>FLUSH THREADED PVC SCHED 40</u> Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
F. Fine sand, top ----- ft. MSL or <u>4.0</u> ft.	Manufacturer <u>HOVO FLEX, INC.</u> Slot size: <u>0.210</u> in. Slotted length: <u>20.0</u> ft.
G. Filter pack, top ----- ft. MSL or <u>5.0</u> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> Other <input type="checkbox"/>
H. Well screen, top ----- ft. MSL or <u>7.0</u> ft.	
I. Well screen, bottom ----- ft. MSL or <u>17.0</u> ft.	
J. Filter pack, bottom ----- ft. MSL or <u>17.0</u> ft.	
K. Borehole, bottom ----- ft. MSL or <u>17.0</u> ft.	
L. Borehole, diameter <u>8.0</u> in.	
M. O.D. well casing <u>2.25</u> in.	
N. I.D. well casing <u>2.00</u> in.	

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

Signature [Signature] Firm Dorjeading Estate, LLC

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.

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

Facility/Project Name <u>Corvending Estate</u>	Well Name <u>M10-6</u>
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	<input type="checkbox"/>	4 1
surged with bailer and pumped	<input type="checkbox"/>	6 1
surged with block and bailed	<input type="checkbox"/>	4 2
surged with block and pumped	<input type="checkbox"/>	6 2
surged with block, bailed and pumped	<input type="checkbox"/>	7 0
compressed air	<input type="checkbox"/>	2 0
bailed only	<input type="checkbox"/>	1 0
pumped only	<input type="checkbox"/>	5 1
pumped slowly	<input type="checkbox"/>	5 0
Other _____	<input type="checkbox"/>	<input type="checkbox"/>

3. Time spent developing well _____ min.

4. Depth of well (from top of well casing) 19.0 ft.

5. Inside diameter of well 0.18 in.

6. Volume of water in filter pack and well casing 5.7 gal.

7. Volume of water removed from well 45 gal.

8. Volume of water added (if any) _____ 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)	<u>13.03</u> ft.	<u>12.99</u> ft.
Date	<u>07/11/90</u> m m d d y y	<u> 1 1 </u> m m d d y y
Time	<u>9:00</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<u>3:30</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>brown silty</u>	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) <u>clearing after 30gals. purged</u>
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	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>Kristina M. Stehr</u>	Signature: <u>Kristina M. Stehr</u>
Firm: <u>Davis & Moore</u>	Firm: <u>Davis & Moore, Inc.</u>

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

Facility/Project Name <u>RECOVERING (STATE)</u>	Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name <u>1110-7</u>
Facility License, Permit or Monitoring Number _____	Section Location <u>NE 1/4 of NE 1/4 of Section 35</u>	Wis. Unique Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input checked="" type="checkbox"/> 12	Location of Well Relative to Waste/Source <input type="checkbox"/> Upgradient <input type="checkbox"/> Sidegradient <input type="checkbox"/> Downgradient <input type="checkbox"/> Not Known	Date Well Installed <u>07/10/89</u> m m d d y y
Distance Well Is From Waste/Source Boundary _____ ft.	Well Installed By: (Person's Name and Firm) <u>FRANCON</u>	
Is Well A Point of Enforcement Std. Application? <input type="checkbox"/> Yes <input type="checkbox"/> No		<u>ENVIRONMENTAL 3 Environmental</u>

A. Protective pipe, top elevation ----- ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation -- <u>98.42</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>7.0</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/> -- d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
C. Land surface elevation -- <u>95.56</u> ft. MSL	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/> --
D. Surface seal, bottom ----- ft. MSL or <u>7</u> ft.	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input checked="" type="checkbox"/> -- Other <input type="checkbox"/> --
12. USCS classification of soil near screen: <input type="checkbox"/> GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input checked="" type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock	5. Annular space seal: Granular Bentonite <input checked="" type="checkbox"/> 33 ____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 ____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 ____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 <u>1.3</u> ft ³ volume added for any of the above How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Bentonite seal: Bentonite granules <input type="checkbox"/> 33 <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 <u>None</u> Other <input type="checkbox"/> --
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/> --	7. Fine sand material: Manufacturer, product name and mesh size <u>ARCO, # 90945 silica sand</u> Volume added <u>1.75</u> ft ³
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	8. Filter pack material: Manufacturer, product name and mesh size <u>RED FINE # 30 FINE SAND</u> Volume added <u>0.25</u> ft ³
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/> --
Describe _____	10. Screen material: <u>FLUSH THREADED PVC SCHEDULE 40</u> Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/> --
17. Source of water (attach analysis): _____	Manufacturer <u>MONOFLEX, INC.</u> Slot size: <u>0.010</u> in. Slotted length: <u>10.0</u> ft.
E. Bentonite seal, top ----- ft. MSL or <u>2.5</u> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> -- Other <input type="checkbox"/> --
F. Fine sand, top ----- ft. MSL or <u>4.5</u> ft.	
G. Filter pack, top ----- ft. MSL or <u>5.5</u> ft.	
H. Well screen, top ----- ft. MSL or <u>6.5</u> ft.	
I. Well screen, bottom ----- ft. MSL or <u>11.5</u> ft.	
J. Filter pack, bottom ----- ft. MSL or <u>11.5</u> ft.	
K. Borehole, bottom ----- ft. MSL or <u>11.5</u> ft.	
L. Borehole, diameter <u>8.0</u> in.	
M. O.D. well casing <u>2.25</u> in.	
N. I.D. well casing <u>2.00</u> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature: [Signature] Firm: Dames & Moore Inc.

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

Facility/Project Name <u>Reynolds Estate</u>	Well Name <u>MW-7</u>
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	<input type="checkbox"/>	4 1
surged with bailer and pumped	<input type="checkbox"/>	6 1
surged with block and bailed	<input type="checkbox"/>	4 2
surged with block and pumped	<input type="checkbox"/>	6 2
surged with block, bailed and pumped	<input type="checkbox"/>	7 0
compressed air	<input type="checkbox"/>	2 0
bailed only	<input type="checkbox"/>	1 0
pumped only	<input type="checkbox"/>	5 1
pumped slowly	<input type="checkbox"/>	5 0
Other _____	<input type="checkbox"/>	<input type="checkbox"/>

3. Time spent developing well 40 min.

4. Depth of well (from top of well casing) 14.1 ft.

5. Inside diameter of well 4.18 in.

6. Volume of water in filter pack and well casing 7.9 gal.

7. Volume of water removed from well 90. gal.

8. Volume of water added (if any) --- 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)	<u>5.81</u> ft.	<u>5.88</u> ft.
Date	<u>07/11/90</u> m m d d y y	<u>07/11/90</u> m m d d y y
Time	<u>9:45</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<u>4:45</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10	Clear <input type="checkbox"/> 20
	Turbid <input checked="" type="checkbox"/> 5 (Describe) <u>black</u>	Turbid <input checked="" type="checkbox"/> 2.5 (Describe) <u>still black not as dense as start. let settle before sampling.</u>
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: <u>Diane A. Stillings</u> Firm: <u>Dames & Moore, Ltd.</u>	I hereby certify that the above information is true and correct to the best of my knowledge. Signature: <u>[Signature]</u> Firm: <u>Dames & Moore, Ltd.</u>
--	---

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

Facility/Project Name <u>BURGESS ESTATE</u>	Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name <u>MW-10</u>
Facility License, Permit or Monitoring Number		Wis. Unique Well Number <u>DNR Well Number</u>
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location <u>NE 1/4 of NE 1/4 of Section 35</u>	Date Well Installed <u>02/06/17</u>
Distance Well Is From Waste/Source Boundary ft. _____	T <u>1</u> N. R. <u>12</u> <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.	Well Installed By: (Person's Name and Firm) <u>FLANDON ENVIRONMENTAL Foundation</u>
Is Well A Point of Enforcement Sud. Application? <input type="checkbox"/> Yes <input type="checkbox"/> No	Location of Well Relative to Waste/Source <input type="checkbox"/> Upgradient <input type="checkbox"/> Sidegradient <input type="checkbox"/> Downgradient <input type="checkbox"/> Not Known	

A. Protective pipe, top elevation _____ ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No														
B. Well casing, top elevation <u>98.27</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>7.0</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>														
C. Land surface elevation <u>95.93</u> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____														
D. Surface seal, bottom _____ ft. MSL or <u>7</u> ft.	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/>														
<table border="1"> <tr> <td colspan="2">12. USCS classification of soil near screen: <input type="checkbox"/> GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input checked="" type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock</td> </tr> <tr> <td>13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td></td> </tr> <tr> <td>14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/></td> <td></td> </tr> <tr> <td>15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99</td> <td></td> </tr> <tr> <td>16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</td> <td></td> </tr> <tr> <td colspan="2">Describe _____</td> </tr> <tr> <td colspan="2">17. Source of water (attach analysis): _____</td> </tr> </table>		12. USCS classification of soil near screen: <input type="checkbox"/> GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input checked="" type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock		13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>		15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99		16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Describe _____		17. Source of water (attach analysis): _____	
12. USCS classification of soil near screen: <input type="checkbox"/> GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input checked="" type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock															
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No															
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>															
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99															
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No															
Describe _____															
17. Source of water (attach analysis): _____															
E. Bentonite seal, top _____ ft. MSL or <u>3.0</u> ft.	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input checked="" type="checkbox"/>														
F. Fine sand, top _____ ft. MSL or <u>5.0</u> ft.	5. Annular space seal: Granular Bentonite <input checked="" type="checkbox"/> 33 Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 Lbs/gal mud weight . . . Bentonite slurry <input type="checkbox"/> 31 % Bentonite Bentonite-cement grout <input type="checkbox"/> 50 <u>1.4</u> Ft ³ volume added for any of the above How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08														
G. Filter pack, top _____ ft. MSL or <u>6.0</u> ft.	6. Bentonite seal: Bentonite granules <input checked="" type="checkbox"/> 33 <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 <u>NONE</u> Other <input type="checkbox"/>														
H. Well screen, top _____ ft. MSL or <u>9.0</u> ft.	7. Fine sand material: Manufacturer, product name and mesh size <u>ARCO, #9099 Silica Sand</u> Volume added <u>1.5</u> ft ³														
I. Well screen, bottom _____ ft. MSL or <u>12.0</u> ft.	8. Filter pack material: Manufacturer, product name and mesh size <u>RED FLINT, #30 FLINT SAND</u> Volume added <u>0.35</u> ft ³														
J. Filter pack, bottom _____ ft. MSL or <u>17.0</u> ft.	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>														
K. Borehole, bottom _____ ft. MSL or <u>17.0</u> ft.	10. Screen material: <u>FLUSH THREADED PVC SCHED.</u> Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>														
L. Borehole, diameter <u>8.0</u> in.	Manufacturer <u>HONDIFLEX, INC</u> Slot size: <u>0.010</u> in. Slotted length: <u>5.0</u> ft.														
M. O.D. well casing <u>2.25</u> in.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> Other <input type="checkbox"/>														
N. I.D. well casing <u>2.00</u> in.															

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature Frank M. Stille Firm Dumas & Moore, Ltd.

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

Facility/Project Name <u>Remediating Estate</u>	Well Name <u>MW-10</u>	
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	<input checked="" type="checkbox"/> 4 1
surged with bailer and pumped	<input type="checkbox"/> 6 1
surged with block and bailed	<input type="checkbox"/> 4 2
surged with block and pumped	<input type="checkbox"/> 6 2
surged with block, bailed and pumped	<input type="checkbox"/> 7 0
compressed air	<input type="checkbox"/> 2 0
bailed only	<input type="checkbox"/> 1 0
pumped only	<input type="checkbox"/> 5 1
pumped slowly	<input type="checkbox"/> 5 0
Other _____	<input type="checkbox"/> _____

3. Time spent developing well 35 min.

4. Depth of well (from top of well casing) 13.6 ft.

5. Inside diameter of well 0.18 in.

6. Volume of water in filter pack and well casing 1.1 gal.

7. Volume of water removed from well 9 gal.

8. Volume of water added (if any) _____ 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)	<u>12.47</u> ft.	<u>12.62</u> ft.
Date	<u>7/11/90</u> m m d d y y	<u>7/11/90</u> m m d d y y
Time	<u>9:00</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<u>4:30</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>brn. salty</u>	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) <u>after 3gals.</u>
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	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>Kristina Stehr</u>	Signature: <u>Kristina M. Stehr</u>
Firm: <u>Dames & Moore, Ltd.</u>	Firm: <u>Dames & Moore, Ltd.</u>

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

APPENDIX C
CHAINS OF CUSTODY



ENVIRONMENTAL SERVICES

140 E. RYAN RD
OAK CREEK, WI 53154
(414) 764-7005
1 800-365-3840

CLIENT: *Borgerding Estate*
~~University of Wisconsin~~

PROJECT LOCATION: *Beloit*

QUOTE NUMBER: *8447463* (3-16-90)

CHAIN OF CUSTODY

No. 31207

PLEASE PRESS FIRMLY WHEN WRITING

SAMPLER (Signature) <i>Kristine M. Stehr</i>	AFFILIATION <i>DAMES + MOORE</i>	DATE <i>3-14-90</i>	TIME
PURPOSE OF ANALYSIS <i>TPH</i>			

ITEM NUMBER	NUMBER AND SIZE OF CONTAINERS	DESCRIPTION	TRANSFER NUMBER				
			1	2	3	4	5
1-1	<i>4oz. glass</i> ↓	<i>B-1/3.5'-5.0'</i>					
2-1		<i>B-2/1.0'-2.5'</i>					
3-1		<i>B-3/3.5'-5.0'</i>					
4-1		<i>B-4/9.5'-11.0'</i>					
5-1		<i>B-5/6.5'-8.0'</i>					
		<i>* Please label report w/ "Ursula Borgerding Estate"</i>					
		<i>** Attn: Kristine Stehr</i>					
		<i>* expect high concentration</i>					
		<i>90075</i>					
			<i>D07413</i>				
			<i>D07414</i>				
			<i>D07415</i>				
			<i>D07416</i>				
			<i>D07417</i>				

TRANSFER NUMBER	ITEM NUMBER	RELINQUISHED BY (Signature)	ACCEPTED BY (Signature)	DATE	TIME
1		<i>Kristine M. Stehr</i>	<i>D. Kutz</i>	<i>3/16/90</i>	<i>8:10</i>
2		<i>D. Kutz</i>	<i>Amie Hawcof</i>	<i>5-8-90</i>	<i>6:00</i>
3		<i>Amie Hawcof</i>			
4					
5					



ENVIRONMENTAL SERVICES

140 E. RYAN RD
OAK CREEK, WI 53154
(414) 764-7005
1-800-365-3840

CLIENT <i>DODD</i>
<i>BORGERDING ESTATE</i>
PROJECT LOCATION <i>BELOIT</i>
QUOTE NUMBER <i>8447464</i>

CHAIN OF CUSTODY

PLEASE PRESS FIRMLY WHEN WRITING

No. 31296

3-16-90

SAMPLER (Signature) <i>Kristine Stehr</i>	AFFILIATION <i>DAMES + MOORE</i>	DATE <i>3/15</i>	TIME
PURPOSE OF ANALYSIS <i>BTEX</i>			

ITEM NUMBER	NUMBER AND SIZE OF CONTAINERS	DESCRIPTION	TRANSFER NUMBER				
			1	2	3	4	5
<i>1-1</i>	<i>4x40ml glass</i>	<i>MW-1 D07419</i>					
<i>2-1</i>	<i>↓</i>	<i>MW-2 D07420</i>					
<i>3-1</i>		<i>MW-3 D07421</i>					
<i>4-1</i>							
		<i>* Please title w/ "Ursula Borgering Estate"</i>					
		<i>ATTN: Kristine Stehr</i>					

TRANSFER NUMBER	ITEM NUMBER	RELINQUISHED BY (Signature)	ACCEPTED BY (Signature)	DATE	TIME
<i>1</i>		<i>Kristine Stehr</i>	<i>D. Kutz</i>	<i>3/16/90</i>	<i>8:10</i>
<i>2</i>		<i>D. Kutz</i>			
<i>3</i>					
<i>4</i>					
<i>5</i>					

CHAIN OF CUSTODY RECORD

PROJ. NO.		PROJECT NAME				NO. OF CONTAINERS	SAMPLE DESCRIPTION									
SAMPLERS:																
STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION											
	7/5				B-6/MW-6/5/12'-13.5'	1	<div style="text-align: center;"> <p>IPH-ID</p> <p>SOIL</p> <p>↑</p> <p>↓</p> </div>									
	↓				B-7/MW-7/3/6'-7.5'	1										
	↓				B-8/4/9.5'-10'	1										
	7/6				B-9/3/6'-7.5'	1										
	↓				B-10/MW-10/3/6'-7.5'	1										
	↓				B-11/3/6'-7.5'	1	<div style="text-align: right;"> <p>M. S. H. 1201 (B)</p> </div>									
Relinquished By:		Date / Time		Received By:		Relinquished By:		Date / Time		Received By:						
[Signature]		7/6/90 4:55		[Signature]												
Relinquished By:		Date / Time		Received By:		Relinquished By:		Date / Time		Received By:						



Corporate Office:
 24156-58 Haggerty Rd.
 Farmington Hill, MI 48024
 (313) 478-2700
 Fax (313) 478-3819

Laboratory Services:
 3150 North Brookfield Rd.
 Brookfield, WI 53005
 (414) 783-6111
 Fax (414) 783-5752

Remarks:

Report To:



ENVIRONMENTAL SERVICES

110 E RYAN RD
OAK CREEK, WI 53154
(414) 764-7005
1-800-365-3840

CLIENT

CSL / D&M (D325)

PROJECT LOCATION

Ursula Bergerding Estate

QUOTE NUMBER

7-12 8452474

CHAIN OF CUSTODY

No. 31229

PLEASE PRESS FIRMLY WHEN WRITING

SAMPLER (Signature) <i>Kristin M. Stehr</i>	AFFILIATION CSL/D&M	DATE 7/11/90	TIME
PURPOSE OF ANALYSIS VOCs (to include BTEX) 8240 Volatiles			

ITEM NUMBER	NUMBER AND SIZE OF CONTAINERS	DESCRIPTION	TRANSFER NUMBER				
			1	2	3	4	5
1	4x40 ml glass ↓	MW-6					
2		MW-7					
3		MW-10					
		90193- D07413 D07414 D07415 Danis + Moore ↗ * Kristin Stehr * label rpts. w/ "Ursula Bergerding Estate"					

TRANSFER NUMBER	ITEM NUMBER	RELINQUISHED BY (Signature)	ACCEPTED BY (Signature)	DATE	TIME
1	3	<i>Kristin M. Stehr</i>	<i>Janelle Updike</i>	7/12/90	10:25
2		<i>Janelle Updike</i>	<i>Cody [unclear]</i>	7/12/90	11:25
3		<i>Cody [unclear]</i>			
4					
5					



ENVIRONMENTAL SERVICES

100 E. RYAN RD
OAK CREEK, WI 53154
(414) 764-7005
1-800-365-3840

CLIENT

CSR/D&M

PROJECT LOCATION

Borgerding Estate

QUOTE NUMBER

CHAIN OF CUSTODY

PLEASE PRESS
FIRMLY
WHEN WRITING

No. 39027

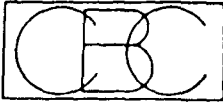
SAMPLER (Signature) <i>Fristine M. Stehr</i>	AFFILIATION CSR/D+M	DATE 7/12/90	TIME
PURPOSE OF ANALYSIS Inorganic Phenols			

P325
8452610
7/16/90

ITEM NUMBER	NUMBER AND SIZE OF CONTAINERS	DESCRIPTION	TRANSFER NUMBER				
			3	4	5		
1	1 qt. glass preserved ↓	MW 4					
2		MW-7	901971	DO-7413			
3		MW-10		DO-7414			
<p>* Attn: Fristine Stehr</p> <p>* Label rpt. w/ "Ursula Borgerding Estate"</p>							

TRANSFER NUMBER	ITEM NUMBER	RELINQUISHED BY (Signature)	ACCEPTED BY (Signature)	DATE	TIME
1	3	<i>Fristine M. Stehr</i>	<i>William L. English</i>	7/14/90	9:00 AM
2		<i>William L. English</i>	<i>D. Kutz</i>	7/16/90	9:20
3		<i>D. Kutz</i>	<i>Carolyn</i>	7/16/90	12:15
4		<i>Carolyn</i>			
5					

APPENDIX D
LABORATORY REPORTS
SOIL SAMPLES



ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION

140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

03/23/90

LABORATORY REPORT

PAGE 1

D325 8447463 W31

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90075-D07413 URSULA BORGERDING ESTATE/BELOIT/B-1/3.5-5.0'
DATE COLLECTED 03/14/90 DATE RECEIVED 03/16/90

TEST NAME	RESULT	UNITS
TOTAL PETROLEUM HYDROCARBONS	1800	PPM
BASED ON SIMILARITIES TO THE DIESEL STANDARD.		

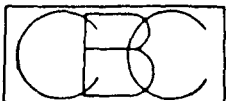
PLEASE CONTACT OUR CLIENT SERVICE DEPARTMENT WITH QUESTIONS. REMAINING WASTE SAMPLES WILL BE RETURNED 6 WEEKS FROM THE RECEIVING DATE OF SAMPLE. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT. WI DNR LAB CERTIFICATION #241283020/A.I.H.A. ACCREDITED.

! = REPRINT N/T = NOT TESTED N/A = NOT APPLICABLE APPROVAL *M.J.W.*

FAX #414-764-0486

WI DNR LAB CERTIFICATION #241283020

1-800-365-3840



ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION
140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

03/27/90

LABORATORY REPORT

PAGE 1

D325 8447463 W31

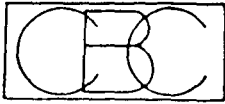
DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE ,WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90075-D07414 URSULA BORGERDING ESTATE/BELOIT/B-2/1.0-2.5'
DATE COLLECTED 03/14/90 DATE RECEIVED 03/16/90

TEST NAME	RESULT	UNITS
TOTAL PETROLEUM HYDROCARBONS	920	PPM
	GASOLINE	

PLEASE CONTACT OUR CLIENT SERVICE DEPARTMENT WITH QUESTIONS. REMAINING WASTE SAMPLES WILL BE RETURNED 6 WEEKS FROM THE RECEIVING DATE OF SAMPLE. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT. WI DNR LAB CERTIFICATION #241283020/A.I.H.A. ACCREDITED.

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ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION

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03/27/90

LABORATORY REPORT

PAGE 1

D325 8447463 W31

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90075-D07415 URSULA BORGERDING ESTATE/BELOIT/B-3/3.5-5.0'
DATE COLLECTED 03/14/90 DATE RECEIVED 03/16/90

TEST NAME	RESULT	UNITS
TOTAL PETROLEUM HYDROCARBONS	1100	PPM
	GASOLINE	

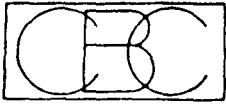
PLEASE CONTACT OUR CLIENT SERVICE DEPARTMENT WITH QUESTIONS. REMAINING WASTE SAMPLES WILL BE RETURNED 6 WEEKS FROM THE RECEIVING DATE OF SAMPLE. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT. WI DNR LAB CERTIFICATION #241283020/A.I.H.A. ACCREDITED

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FAX #414-764-0486

WI DNR LAB CERTIFICATION #241283020

1-800-365-3840



ENVIRONMENTAL SERVICES

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03/28/90

LABORATORY REPORT

PAGE 1

D325 8447463 W31

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE ,WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90075-D07416 URSULA BORGERDING ESTATE/BELOIT/B-4/9.5-11.0'
DATE COLLECTED 03/14/90 DATE RECEIVED 03/16/90

TEST NAME	RESULT	UNITS
TOTAL PETROLEUM HYDROCARBONS	43	PPM
	BASED ON SIMILARITIES TO GASOLINE STANDARD GASOLINE	

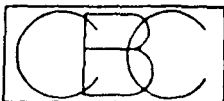
PLEASE CONTACT OUR CLIENT SERVICE DEPARTMENT WITH QUESTIONS. REMAINING WASTE SAMPLES WILL BE RETURNED 6 WEEKS FROM THE RECEIVING DATE OF SAMPLE. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT. WI DNR LAB CERTIFICATION #241283020/A.I.H.A. ACCREDITED.

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1-800-365-3840



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140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

03/29/90

LABORATORY REPORT

PAGE 1

D325 8447463 W31

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE ,WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90075-D07417 URSULA BORGERDING ESTATE/BELOIT/B-5/6.5-8.0'
DATE COLLECTED 03/14/90 DATE RECEIVED 03/16/90

TEST NAME	RESULT	UNITS
TOTAL PETROLEUM HYDROCARBONS	3100	PPM
	GASOLINE	

PLEASE CONTACT OUR CLIENT SERVICE DEPARTMENT WITH QUESTIONS. REMAINING WASTE SAMPLES WILL BE RETURNED 6 WEEKS FROM THE RECEIVING DATE OF SAMPLE. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT. WI DNR LAB CERTIFICATION #241283020/A.I.H.A. ACCREDITED.

! = REPRINT N/T = NOT TESTED N/A = NOT APPLICABLE APPROVAL *M.P.*

FAX #414-764-0486

WI DNR LAB CERTIFICATION #241283020

1-800-365-3840

3150 North Brookfield Road
 Brookfield, Wisconsin 53005
 telephone (414) 783-6111
 facsimile (414) 783-5752



AIHA Accreditation #352
 WDNR Certification #268181760

ANALYTICAL REPORT

REPORT NUMBER: B1623

Dames & Moore
 250 East Wisconsin Avenue, Suite 1500
 Milwaukee, WI 53202

Attn: Ms. Kristine Stehr

DATE: July 26, 1990
 PURCHASE ORDER:
 SEI JOB NO: WL3421
 DATE COLLECTED: 07/05&06/90
 DATE RECEIVED: 07/06/90

Soil Samples

Units: mg/kg (ppm)
 Detection Limit: 5

<u>SEI ID</u>	<u>Sample ID</u>	<u>Total Petroleum Hydrocarbons*</u>
3421-1	B-6/MW-6/5/12'-13.5'	ND
3421-2	B-7/MW-7/3/6'-7.5'	88
3421-3	B-8/4/8.5'-10'	154
3421-4	B-9/3/6'-7.5'	604
3421-5	B-10/MW-10/3/6'-7.5'	41
3421-6	B-11/3/6'-7.5'	136

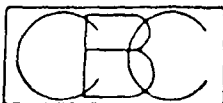
* Concentration based on fuel oil #2 standard using the State of California Method.

ND--Not Detected

Reviewed & Approved by:

Rosemary L. Dineen
 Laboratory Director

APPENDIX E
LABORATORY REPORTS
GROUND WATER SAMPLES



ENVIRONMENTAL SERVICES

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04/04/90

LABORATORY REPORT

PAGE 1

D325 8447464 W31

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90075-D07419 URSULA BORGERDING ESTATE/BELOIT/WATER/MW-1
DATE COLLECTED 03/15/90 DATE RECEIVED 03/16/90

TEST NAME	RESULT	UNITS	
BENZENE	1300	PPB	!
TOLUENE	<20	PPB	!
	HIGH DETECTION LIMITS DUE TO SAMPLE CONCENTRATION.		
XYLENE	100	PPB	!
ETHYL BENZENE	71	PPB	!

PLEASE CONTACT OUR CLIENT SERVICE DEPARTMENT WITH QUESTIONS. REMAINING WASTE SAMPLES WILL BE RETURNED 6 WEEKS FROM THE RECEIVING DATE OF SAMPLE. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT. WI DNR LAB CERTIFICATION #241283020/A.I.H.A. ACCREDITED.

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04/04/90

LABORATORY REPORT

PAGE 1

D325 8447464 W31

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90075-D07420 URSULA BORGERDING ESTATE/BELOIT/WATER/MW-2
DATE COLLECTED 03/15/90 DATE RECEIVED 03/16/90

TEST NAME	RESULT	UNITS	
BENZENE	220	PPB	!
TOLUENE	9.0	PPB	!
XYLENE	660	PPB	!
ETHYL BENZENE	<2.0	PPB	!

PLEASE CONTACT OUR CLIENT SERVICE DEPARTMENT WITH QUESTIONS. REMAINING WASTE SAMPLES WILL BE RETURNED 6 WEEKS FROM THE RECEIVING DATE OF SAMPLE. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT. WI DNR LAB CERTIFICATION #241283020/A.I.H.A. ACCREDITED.

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04/04/90

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PAGE 1

D325 8447464 W31

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

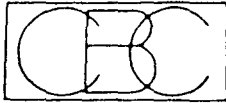
SAMPLE 90075-D07421 URSULA BORGERDING ESTATE/BELOIT/WATER/MW-3
DATE COLLECTED 03/15/90 DATE RECEIVED 03/16/90

TEST NAME	RESULT	UNITS
BENZENE	5400	PPB
TOLUENE	660	PPB
XYLENE	2100	PPB
ETHYL BENZENE	130	PPB

!
!
!
!

PLEASE CONTACT OUR CLIENT SERVICE DEPARTMENT WITH QUESTIONS. REMAINING WASTE SAMPLES WILL BE RETURNED 6 WEEKS FROM THE RECEIVING DATE OF SAMPLE. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT. WI DNR LAB CERTIFICATION #241283020/A.I.H.A. ACCREDITED.

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07/24/90

LABORATORY REPORT

PAGE 1

D325 8452474 W61

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90193-D07413 MW-6/WATER/COLD SPRING RESOURCES/URSULA BORGERDING
ESTATE

DATE COLLECTED 07/11/90 DATE RECEIVED 07/12/90

TEST NAME	RESULT	UNITS
GCMS BENZENE	<5.0	PPB
GCMS BROMODICHLOROMETHANE	<5.0	PPB
GCMS BROMOFORM	<5.0	PPB
GCMS BROMOMETHANE	<10	PPB
GCMS CARBON TETRACHLORIDE	<5.0	PPB
GCMS CHLOROBENZENE	<5.0	PPB
GCMS CHLOROETHANE	<10	PPB
2-CHLOROETHYL VINYL ETHER	<10	PPB
GCMS CHLOROFORM	<5.0	PPB
GCMS CHLOROMETHANE	<10	PPB
GCMS DIBROMOCHLOROMETHANE	<5.0	PPB
GCMS 1,1-DICHLOROETHANE	<5.0	PPB
GCMS 1,2-DICHLOROETHANE	<5.0	PPB
GCMS 1,1-DICHLOROETHENE	<5.0	PPB
1,2-DICHLOROETHENE (MIXED)	<5.0	PPB
GCMS 1,2-DICHLOROPROPANE	<5.0	PPB
GCMS CIS-1,3-DICHLOROPROPE	<5.0	PPB
GCMS TRANS-1,3-DICHLORPROP	<5.0	PPB
GCMS ETHYL BENZENE	<5.0	PPB
GCMS METHYLENE CHLORIDE	<5.0	PPB
GCMS 1,1,2,2-TETRACHLORETH	<5.0	PPB
GCMS TETRACHLOROETHENE	<5.0	PPB
GCMS TOLUENE	<5.0	PPB
GCMS 1,1,1-TRICHLOROETHANE	<5.0	PPB
GCMS 1,1,2-TRICHLOROETHANE	<5.0	PPB
GCMS TRICHLOROETHENE	<5.0	PPB
GCMS TRICHLOROFLUOROMETHAN	<10	PPB
GCMS VINYL CHLORIDE	<10	PPB
GCMS ACROLEIN	<100	PPB
GCMS ACRYLONITRILE	<100	PPB
GCMS DICHLORODIFLUOROMETHA	<10	PPB
GCMS ACETONE	<10	PPB
GCMS CARBON DISULFIDE	32	PPB

*see how well log
for this water sources.*

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED

N/A = NOT APPLICABLE

APPROVAL JKS

WI DNR LAB CERTIFICATION #241283020



ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION

140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

07/24/90

LABORATORY REPORT

PAGE 2

D325 8452474 W61

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE ,WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90193-D07413 MW-6/WATER/COLD SPRING RESOURCES/URSULA BORGERDING
ESTATE

DATE COLLECTED 07/11/90 DATE RECEIVED 07/12/90

TEST NAME	RESULT	UNITS
GCMS 2-BUTANONE (MEK)	<10	PPB
GCMS VINYL ACETATE	<10	PPB
4-METHYL-2-PENTANONE(MIBK)	<10	PPB
GCMS 2-HEXANONE	<10	PPB
GCMS STYRENE	<5.0	PPB
XYLENES TOTAL	<5.0	PPB
GCMS DIBROMOMETHANE	<5.0	PPB
GCMS ETHYL METHACRYLATE	<5.0	PPB
GCMS IODOMETHANE	<5.0	PPB
GCMS 1,2,3-TRICHLOROPROPAN	<5.0	PPB
GCMS 1,4-DICHLORO-2-BUTENE	<100	PPB

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED

N/A = NOT APPLICABLE

WI DNR LAB CERTIFICATION #241283020

APPROVAL CCS

FAX #414-764-0486

CLIENT SERVICES DIRECT LINE 414-768-7460

1-800-365-3840



ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION
140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

07/20/90

LABORATORY REPORT

PAGE 1

D325 8452610 W70

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90197-D07413 WATER/MW-6/COLD SPRING RESOURCES/BORGERDING ESTATE
DATE COLLECTED 07/12/90 DATE RECEIVED 07/16/90

TEST NAME	RESULT	UNITS
PHENOLICS	0.01	MG/L

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED

N/A = NOT APPLICABLE

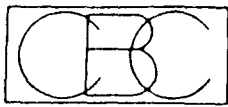
APPROVAL

WI DNR LAB CERTIFICATION #241283020

FAX #414-764-0486

CLIENT SERVICES DIRECT LINE 414-768-7460

1-800-365-3840



ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION
140 EAST RYAN ROAD

OAK CREEK, WI 53154-4599 (414) 764-7005

07/24/90

LABORATORY REPORT

PAGE 1

D325 8452474 W61

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90193-D07414 MW-7/WATER/COLD SPRING RESOURCES/URSULA BORGERDING
ESTATE

DATE COLLECTED 07/11/90 DATE RECEIVED 07/12/90

TEST NAME	RESULT	UNITS
GCMS BENZENE	11 ✓	PPB
GCMS BROMODICHLOROMETHANE	<5.0	PPB
GCMS BROMOFORM	<5.0	PPB
GCMS BROMOMETHANE	<10	PPB
GCMS CARBON TETRACHLORIDE	<5.0	PPB
GCMS CHLOROETHANE	<10	PPB
GCMS CHLOROBENZENE	<5.0	PPB
GCMS CHLOROETHANE	<10	PPB
2-CHLOROETHYL VINYL ETHER	<10	PPB
GCMS CHLOROFORM	<5.0	PPB
GCMS CHLOROMETHANE	<10	PPB
GCMS DIBROMOCHLOROMETHANE	<5.0	PPB
GCMS 1,1-DICHLOROETHANE	<5.0	PPB
GCMS 1,2-DICHLOROETHANE	<5.0	PPB
GCMS 1,1-DICHLOROETHENE	<5.0	PPB
1,2-DICHLOROETHENE (MIXED)	<5.0	PPB
GCMS 1,2-DICHLOROPROPANE	<5.0	PPB
GCMS CIS-1,3-DICHLOROPROPE	<5.0	PPB
GCMS TRANS-1,3-DICHLORPROP	<5.0	PPB
GCMS ETHYL BENZENE	<5.0	PPB
GCMS METHYLENE CHLORIDE	<5.0	PPB
GCMS 1,1,2,2-TETRACHLORETH	<5.0	PPB
GCMS TETRACHLOROETHENE	<5.0	PPB
GCMS TOLUENE	<5.0	PPB
GCMS 1,1,1-TRICHLOROETHANE	<5.0	PPB
GCMS 1,1,2-TRICHLOROETHANE	<5.0	PPB
GCMS TRICHLOROETHENE	<5.0	PPB
GCMS TRICHLOROFLUOROMETHAN	<10	PPB
GCMS VINYL CHLORIDE	<10	PPB
GCMS ACROLEIN	<100	PPB
GCMS ACRYLONITRILE	<100	PPB
GCMS DICHLORODIFLUOROMETHA	<10	PPB
GCMS ACETONE	26	PPB
BLANK = 17 PPB		

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED

N/A = NOT APPLICABLE

APPROVAL CK'S

WI DNR LAB CERTIFICATION #241283020

FAX #414-764-0486

CLIENT SERVICES DIRECT LINE 414-768-7460

1-800-365-3840



ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION
140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

07/24/90

LABORATORY REPORT

PAGE 2

D325 8452474 W61

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90193-D07414 MW-7/WATER/COLD SPRING RESOURCES/URSULA BORGERDING
ESTATE

DATE COLLECTED 07/11/90 DATE RECEIVED 07/12/90

TEST NAME	RESULT	UNITS
GCMS CARBON DISULFIDE	32	PPB
GCMS 2-BUTANONE (MEK)	<10	PPB
GCMS VINYL ACETATE	<10	PPB
4-METHYL-2-PENTANONE(MIBK)	<10	PPB
GCMS 2-HEXANONE	<10	PPB
GCMS STYRENE	<5.0	PPB
XYLENES TOTAL	<5.0	PPB
GCMS DIBROMOMETHANE	<5.0	PPB
GCMS ETHYL METHACRYLATE	<5.0	PPB
GCMS IODOMETHANE	<5.0	PPB
GCMS 1,2,3-TRICHLOROPROPAN	<5.0	PPB
GCMS 1,4-DICHLORO-2-BUTENE	<100	PPB

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED

N/A = NOT APPLICABLE

APPROVAL CKS

WI DNR LAB CERTIFICATION #241283020

FAX #414-764-0486

CLIENT SERVICES DIRECT LINE 414-768-7460

1-800-365-3840



ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION

140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

07/20/90

LABORATORY REPORT

PAGE 1

D325 8452610 W70

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90197-D07414 WATER/MW-7/COLD SPRING RESOURCES/BORGERDING ESTATE
DATE COLLECTED 07/12/90 DATE RECEIVED 07/16/90

TEST NAME	RESULT	UNITS
PHENOLICS	0.06	MG/L

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED

N/A = NOT APPLICABLE

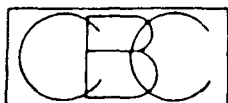
WI DNR LAB CERTIFICATION #241283020

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ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION

140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

07/25/90

LABORATORY REPORT

PAGE 1

D325 8452474 W61

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90193-007415 MW-10/WATER/COLD SPRING RESOURCES/URSULA
BORGERDING ESTATE

DATE COLLECTED 07/11/90 DATE RECEIVED 07/12/90

TEST NAME	RESULT	UNITS
GCMS BENZENE	12	PPB
GCMS BROMODICHLOROMETHANE	<10	PPB
GCMS BROMOFORM	<10	PPB
GCMS BROMOMETHANE	<20	PPB
GCMS CARBON TETRACHLORIDE	<10	PPB
GCMS CHLOROETHANE	<20	PPB
GCMS CHLOROBENZENE	<10	PPB
GCMS CHLOROETHANE	<20	PPB
2-CHLOROETHYL VINYL ETHER	<20	PPB
GCMS CHLOROFORM	<10	PPB
GCMS CHLOROMETHANE	<20	PPB
GCMS DIBROMOCHLOROMETHANE	<10	PPB
GCMS 1,1-DICHLOROETHANE	<10	PPB
GCMS 1,2-DICHLOROETHANE	<10	PPB
GCMS 1,1-DICHLOROETHENE	<10	PPB
1,2-DICHLOROETHENE (MIXED)	<10	PPB
GCMS 1,2-DICHLOROPROPANE	<10	PPB
GCMS CIS-1,3-DICHLOROPROPE	<10	PPB
GCMS TRANS-1,3-DICHLORPROP	<10	PPB
GCMS ETHYL BENZENE	<10	PPB
GCMS METHYLENE CHLORIDE	<10	PPB
GCMS 1,1,2,2-TETRACHLORETH	<10	PPB
GCMS TETRACHLOROETHENE	<10	PPB
GCMS TOLUENE	<10	PPB
GCMS 1,1,1-TRICHLOROETHANE	<10	PPB
GCMS 1,1,2-TRICHLOROETHANE	<10	PPB
GCMS TRICHLOROETHENE	<10	PPB
GCMS TRICHLOROFUOROMETHAN	<20	PPB
GCMS VINYL CHLORIDE	<20	PPB
GCMS ACROLEIN	<200	PPB
GCMS ACRYLONITRILE	<200	PPB
GCMS DICHLORODIFLUOROMETHA	<20	PPB
GCMS ACETONE	42	PPB
GCMS CARBON DISULFIDE	54	PPB

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED

N/A = NOT APPLICABLE

APPROVAL M.J.H.

WI DNR LAB CERTIFICATION #241283020

FAX #414-764-0486

CLIENT SERVICES DIRECT LINE 414-768-7460

1-800-365-3840



ENVIRONMENTAL SERVICES

CHEM-BIO CORPORATION
140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

07/25/90

LABORATORY REPORT

PAGE 2

D325 8452474 W61

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90193-D07415 MW-10/WATER/COLD SPRING RESOURCES/URSULA
BORGERDING ESTATE

DATE COLLECTED 07/11/90 DATE RECEIVED 07/12/90

TEST NAME	RESULT	UNITS
GCMS 2-BUTANONE (MEK)	<20	PPB
GCMS VINYL ACETATE	<20	PPB
4-METHYL-2-PENTANONE(MIBK)	69	PPB
GCMS 2-HEXANONE	400	PPB
GCMS STYRENE	<10	PPB
XYLENES TOTAL	<10	PPB
GCMS DIBROMOMETHANE	<10	PPB
GCMS ETHYL METHACRYLATE	<10	PPB
GCMS IODOMETHANE	<10	PPB
GCMS 1,2,3-TRICHLOROPROPAN	<10	PPB
	HIGH DETECTION LIMITS DUE TO MATRIX INTERFERENCE.	
GCMS 1,4-DICHLORO-2-BUTENE	<200	PPB

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED N/A = NOT APPLICABLE
WI DNR LAB CERTIFICATION #241283020

APPROVAL *[Signature]*

FAX #414-764-0486

CLIENT SERVICES DIRECT LINE 414-768-7460

1-800-365-3840



ENVIRONMENTAL SERVICES

CHEM BIO CORPORATION

140 EAST RYAN ROAD OAK CREEK, WI 53154-4599 (414) 764-7005

07/20/90

LABORATORY REPORT

PAGE 1

D325 8452610 W70

DAMES & MOORE
250 E. WISCONSIN AVE
MILWAUKEE, WI 53202
ATTN: KRISTINE STEHR

SAMPLE 90197-D07415 WATER/MW-10/COLD SPRING RESOURCES/BORGERDING ESTATE

DATE COLLECTED 07/12/90 DATE RECEIVED 07/16/90

TEST NAME	RESULT	UNITS
PHENOLICS	0.04	MG/L

PLEASE CONTACT CLIENT SERVICES WITH ANY QUESTIONS. WATER SAMPLES ARE DISPOSED OF 30 DAYS AFTER RECEIPT ; NON-WATER SAMPLES WILL BE RETURNED 6 WEEKS AFTER RECEIPT.

IL EPA CERTIFICATION # 100243; AIHA ACCREDITED.

N/T = NOT TESTED

N/A = NOT APPLICABLE

APPROVAL 

WI DNR LAB CERTIFICATION #241283020

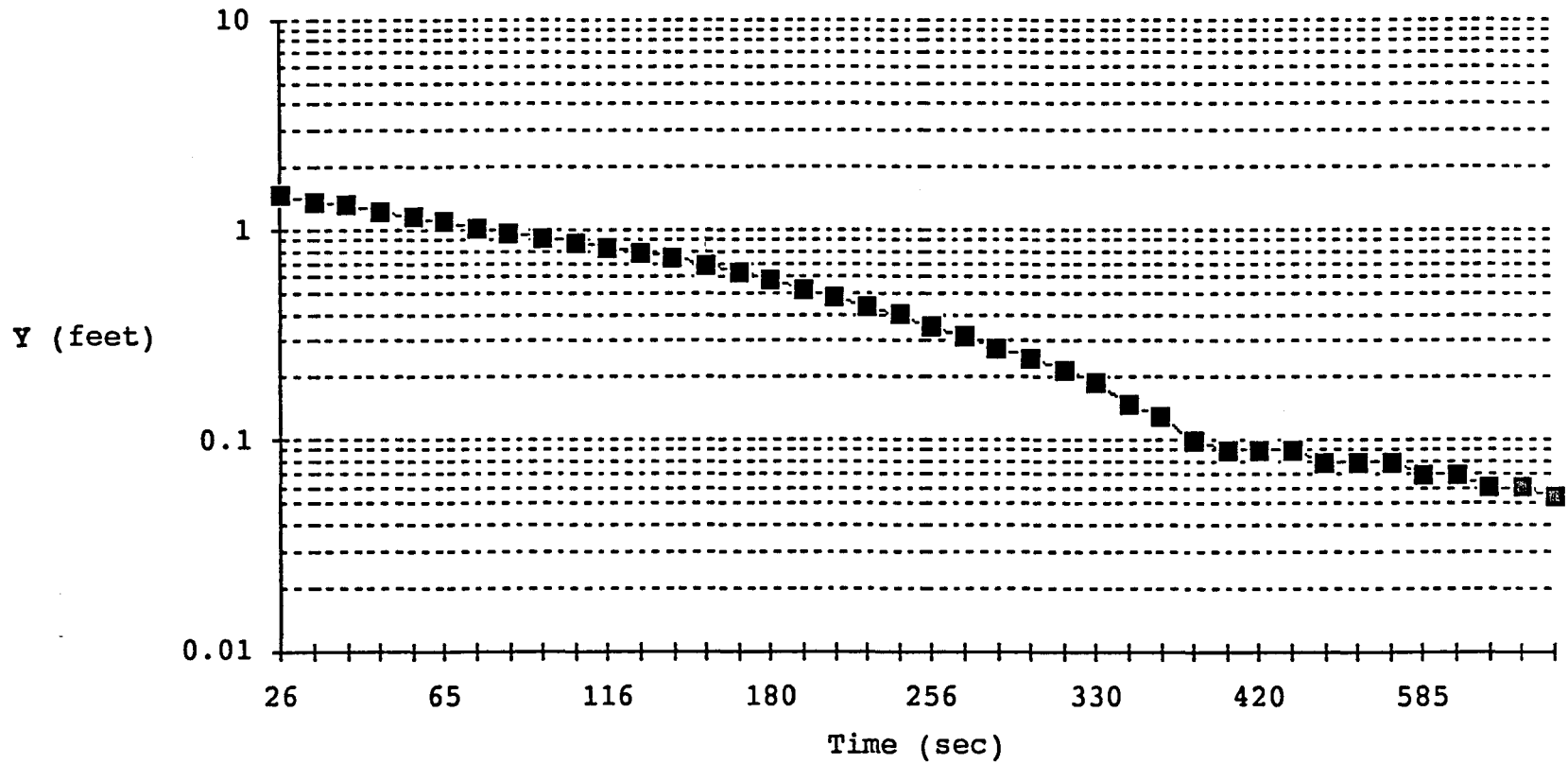
FAX #414-764-0486

CLIENT SERVICES DIRECT LINE 414-768-7460

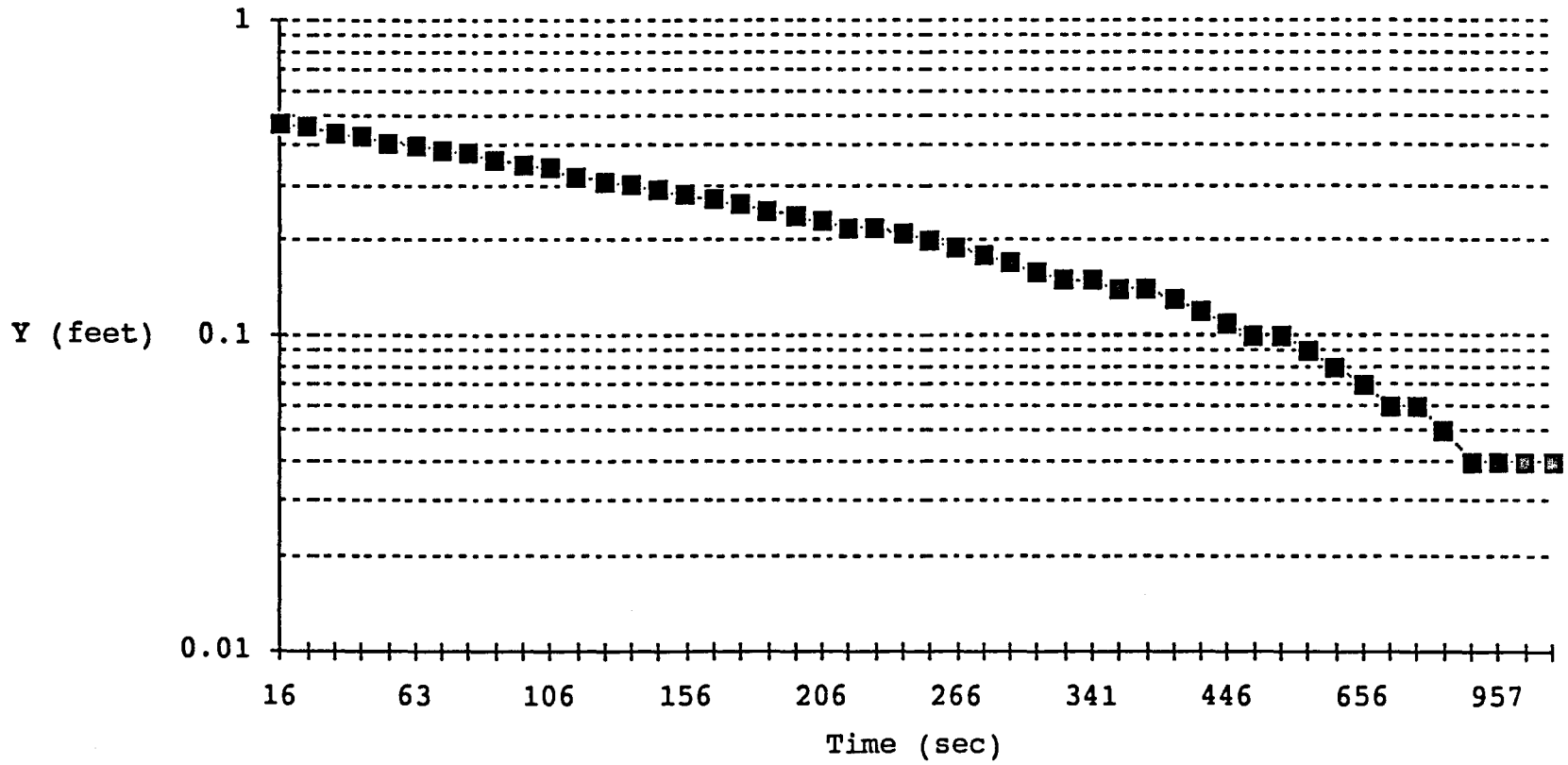
1-800-365-3840

APPENDIX F
SLUG TEST DATA GRAPHS

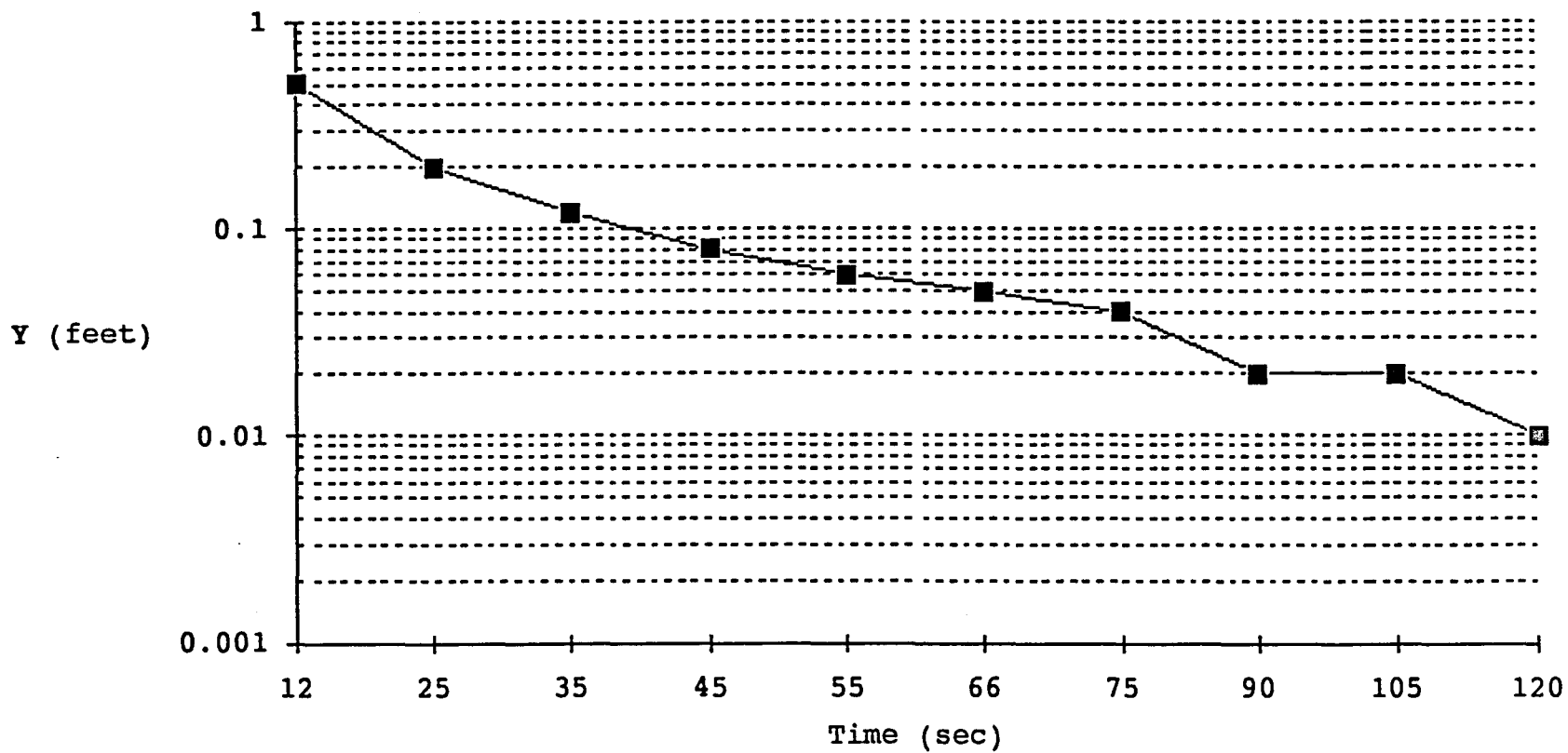
Slug Test - MW1



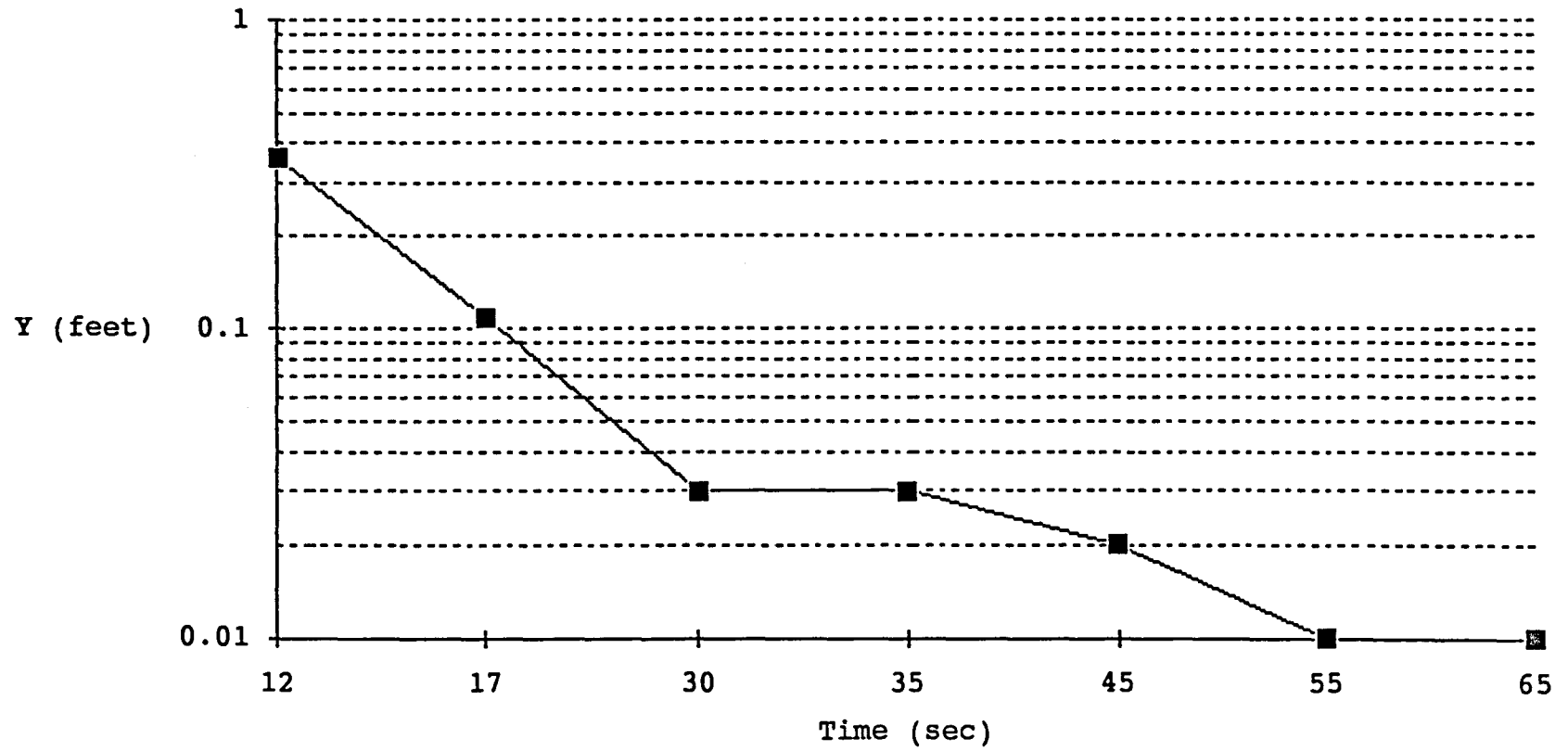
Slug Test - MW2



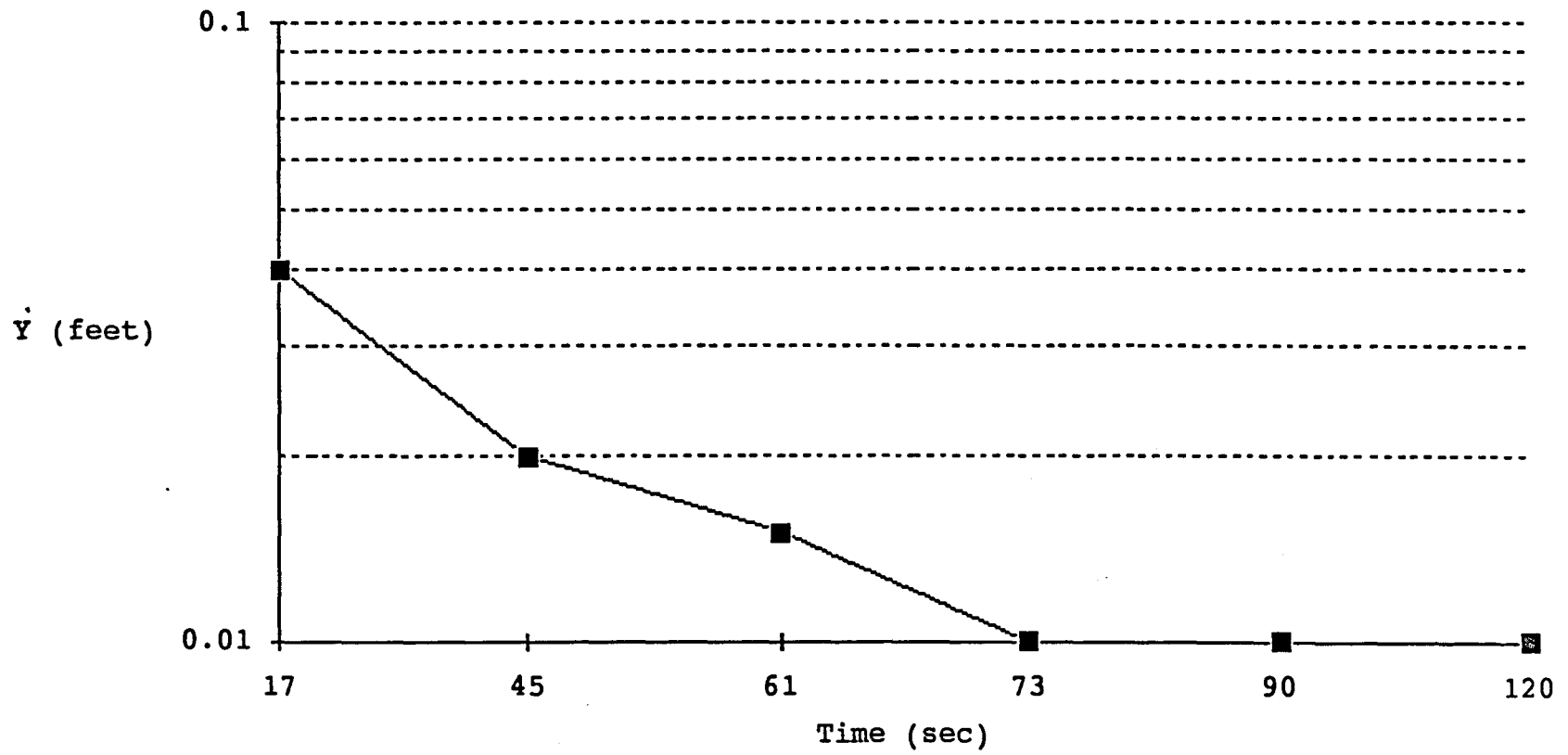
Slug Test - MW3



Slug Test - MW6



Slug Test - MW7



Slug Test - MW10

