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**METAMORA LANDFILL SITE
METAMORA TOWNSHIP, MICHIGAN**

**SITE INVESTIGATION
FINAL REPORT**

**PREPARED FOR
MICHIGAN DEPARTMENT OF
NATURAL RESOURCES**

FEBRUARY 1986

EC. JORDAN CO.

EPA Region 5 Records Ctr.



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FINAL REPORT

METAMORA SITE CHARACTERIZATION
METAMORA MICHIGAN

Prepared for
Michigan Department of Natural Resources

E.C. JORDAN CO.

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1.0 EXECUTIVE SUMMARY

This report describes activities and results of investigations conducted from March to August, 1985 at the Metamora Landfill in Metamora Township, Lapeer County, Michigan. This landfill, over the course of its active life between 1966 and 1980, received chemical and industrial wastes in addition to municipal wastes, including an estimated 35,000 drums of materials. Indications of priority pollutants have been detected in samples of groundwater from the aquifer beneath the site. The principal purpose of the study was to gather hydrogeologic information which would be used to facilitate the development of a work plan for a Remedial Investigation/Feasibility Study (RI/FS) for the site.

Field activities at the site consisted of the installation of 13 new monitoring wells to supplement the 8 monitoring wells already existing. Soil samples were taken and their headspaces tested with an organic vapor analyzer. Gamma logging was conducted in each deep boring installed during the study. Samples of groundwater were taken from the wells to indicate presence of contamination. Measurements of groundwater levels and estimates of permeability based on soil grain sizes, together with observations of the site geology, were used to characterize the hydrogeology of the site and to provide information for the proposed remedial investigation.

The surficial deposits at the site consist principally of three units. A 4 to 16 foot thick layer of sandy silts overlies ice contact sand and gravel

deposits of from 120 to 188 feet thick, which overlie glacial till of undetermined thickness and extent. Regionally, the unconsolidated deposits may be about 300 feet thick and overlie bedrock, the Marshall Sandstone.

The hydrogeology of the site consists of an unconfined aquifer in which groundwater flows generally northward, but with northwest and northeast flow components near the wastes. A north-south trending groundwater divide appears to be present along the middle of the site. One monitoring well indicated a perched groundwater condition of undetermined extent in the northwest corner of the site. The significant surficial aquifer lies within the sandy ice contact deposits rather than the less permeable underlying till. Due to the extremely heterogeneous nature of the surficial deposits, general aquifer flow velocities can only be roughly estimated from hydraulic conductivities determined from individual well data.

The heterogeneous nature of the ice contact materials, including gravels, cobbles and boulders, made drilling of the borings very difficult. A secondary purpose of the study became the development of efficient and cost-effective drilling techniques. Methods attempted included augers, mud-rotary and finally a combination of mud-rotary and wash-and-drive. PVC and steel were used as alternate boring casing materials, with steel being necessarily the material of choice due to strength properties.

The sampling and analysis of groundwater samples from the 19 monitoring wells indicated some low concentrations of volatile organics and phthalates migrating

toward the northerly boundary of the site. The most contaminated groundwater sample contained volatile aromatic organics from 2 to 2.5 milligrams per liter.

The study has identified the need for:

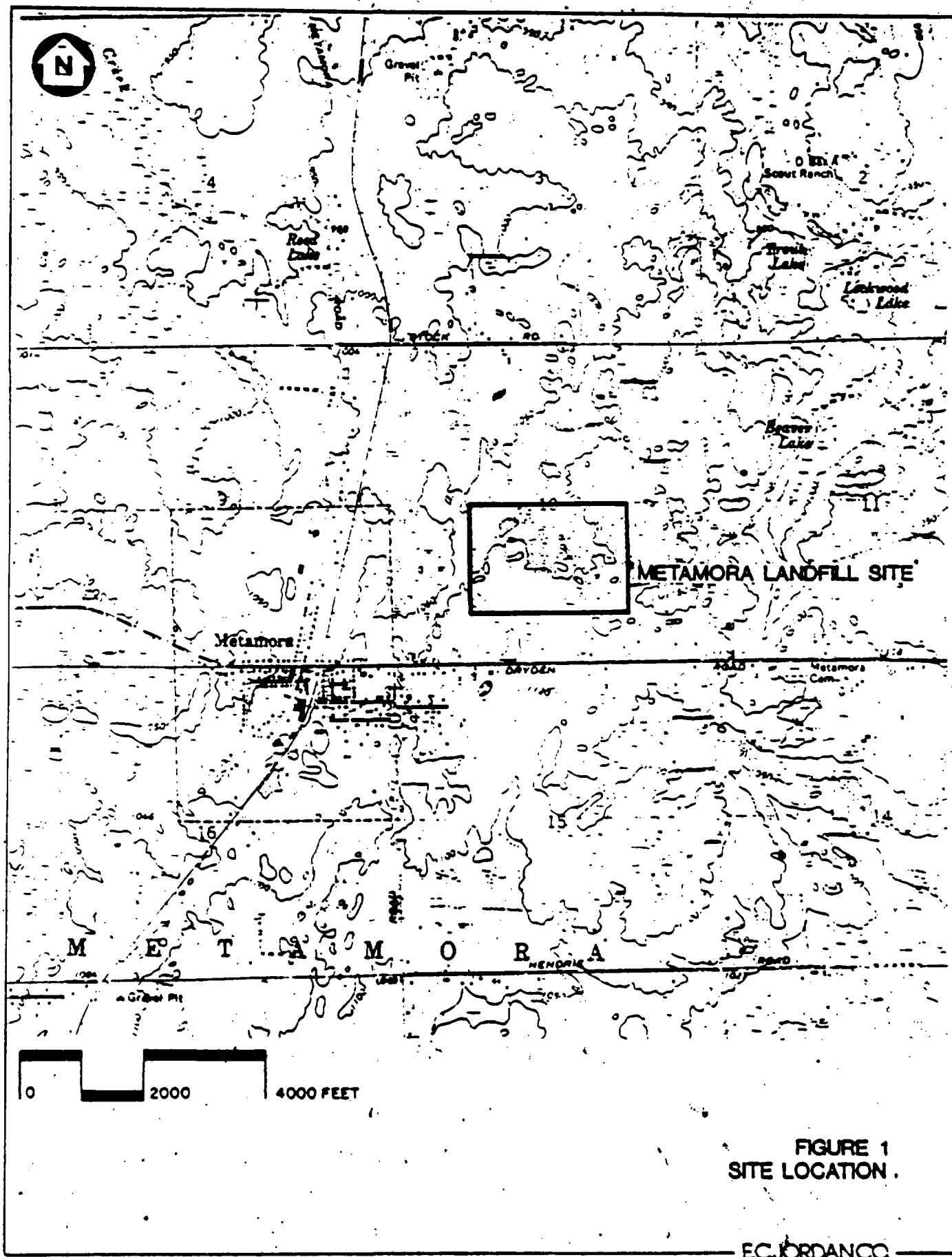
- o further definition of the site geology;
- o a pump test to estimate overall hydraulic conductivity in the aquifer;
- o gathering of chemical data from local drinking water wells;
- o placement of additional wells in areas inferred as probable routes for contaminant migration; and
- o further chemical analysis of groundwater to indicate both the extent of contaminant transport and the probable fate of the contaminants.

2.0 INTRODUCTION

2.1 PROBLEM SUMMARY

The Metamora Landfill Site is located in Section 10, T6N, R10E, Lapeer County, Michigan (see Figure 1). The landfill itself covers approximately 50 acres of a former gravel quarry north of Dryden Road in Metamora Township. The landfill began operation in 1966 as an unregulated open dump. In 1969, it was upgraded to meet prevailing standards and was licensed to receive general refuse. In addition to general refuse, the landfill received industrial and chemical wastes until its closure in 1980. A licensed solid waste transfer station is currently operated at the site. Gravel mining continues approximately 1000 feet south of the landfill.

The study site occupies a local topographic high with numerous steep excavation faces and borrow pits present on the site. The surrounding land uses are primarily residential and agricultural. The property immediately north of the landfill, and in scattered areas to the west and east, is heavily wooded and access is limited. The village of Metamora is located approximately one-half mile west-southwest of the landfill. Most of the disposal area lies within the Kintz Creek watershed. A small portion of the northeast corner may lie within the Hunters Creek drainage basin.



In general, the site surficial geology is characterized by 250 to 300 feet of unconsolidated glacial deposits, including ice-contact and outwash sand and gravel in the upper half of the section, and clay-silt and till below.

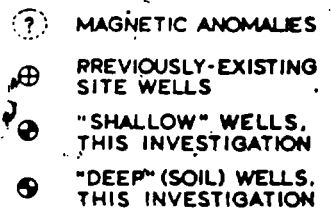
The continuity and extent of the clay-silt and till units has not been established as part of this study. Beneath the unconsolidated deposits lies the Marshall Sandstone, the primary source of groundwater for the area's residential water supplies. Occasionally, the saturated surficial sand and gravel deposits above the clay and till are tapped for domestic groundwater supplies. To date, there is no indication that contamination from the landfill has affected drinking water supplies. Water samples collected from the wells of surrounding residences have shown no indication of detectable contamination by organic or inorganic priority pollutants.

Investigation of the landfill began in response to reports by local citizens that drums were buried in certain areas of the landfill. Subsequent investigations by the Michigan Department of Natural Resources (MDNR) suggested that as many as 35,000 drums, some containing liquid wastes, may be present within the main landfill and nearby shallow disposal areas. A proton magnetometer study conducted by MDNR in 1982 identified five discrete areas of anomalous magnetic readings. The sources associated with three of the five anomalies are thought to be buried deep within the landfill waste (30 to 80 feet) but, because of their presumed depths, these sources have never been excavated to determine the nature of the ferrous metals. These three areas are estimated to contain about 10,000 drums.

The remaining two areas exhibiting anomalous magnetic readings are thought to contain as many as 25,000 drums buried at relatively shallow depths outside the limits of the landfill proper (Figure 2). In September 1982, limited excavation programs conducted in each of these shallow-burial areas confirmed the presence of buried drums containing industrial solvents including toluene, ethyl benzene, and perchloroethylene. Toluene, benzene, xylene, pyrene, and concentrations of dissolved metals have been found in groundwater from monitoring wells installed at the site during investigations completed prior to the Site Investigation.

2.2 PURPOSE AND SCOPE

This project was intended to define local hydrogeologic conditions at the site to guide the development of a program for the Remedial Investigation/Feasibility Study (RI/FS). Although prior studies by the landfill owner's consultant and by the MDNR had revealed groundwater contamination beneath the site, the nature of groundwater flow near the landfill could not be defined conclusively. Two of the main objectives of the Site Investigation were: 1) to determine the direction of groundwater movement in the surficial aquifer; and 2) characterize the subsurface geology at the site. These two factors were considered critical to the development of future plans to assess contamination near the landfill. The collection of preliminary information concerning the distribution of contaminants within the saturated zone was considered to be a secondary objective. This secondary information was to be gathered from the screening of samples collected during the drilling program and from the analysis of



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groundwater samples from monitoring wells installed during the course of the project.

During the course of the investigation, it became necessary to modify the proposed drilling methods due to the geologic conditions encountered at the site. As the project progressed, the development of effective methods for drilling boreholes and installing monitoring wells became an important objective of the study. The development of effective drilling methods was consistent with the overall goal of providing the basic information needed to design an efficient RI/FS work program.

Tasks to be performed during the Site Investigation were specified by MDNR in a document entitled "Work Plan for Phase I, Remedial Investigation, Metamora Landfill, Lapeer County, Michigan." This document contained background information, a detailed scope of work, and specific procedures for performance of the various required tasks.

The scope of work included in the Site Investigation consisted of eight tasks. These tasks were described in the Metamora Landfill (Revised) Work Plan and are summarized below. Tasks 1 - 4 are considered to be Phase I Initial Activities and Tasks 5 - 8 are Site Investigation (Phase II) activities.

- o Task 1 - Prepare and implement a Work Plan.
- o Task 2 - Prepare and implement a Site Specific Safety Plan.

- o Task 3 - Establish a site control (headquarters) area and provide vehicular access to work locations.
- o Task 4 - Support MDNR's community relations program, as necessary.
- o Task 5 - Conduct a subsurface exploration program consisting of 14 soil borings and 14 monitoring well installations.
- o Task 6 - Sample groundwater in existing and newly-installed monitoring wells.
- o Task 7 - Submit groundwater samples to the E.C. Jordan (Jordan) laboratory for chemical analysis.
- o Task 8 - Prepare and submit a report documenting the methods, findings, conclusions, and recommendations resulting from the Site Investigation.

3.0 SITE INVESTIGATION

3.1 INITIAL ACTIVITIES

Before the proposed field activities could begin, it was necessary to prepare a Site Safety Plan, establish a site control (headquarters) area, and provide adequate access for vehicles to reach proposed work areas. Jordan arranged for and supervised the construction of a gravel access road, locking gate, trailer pads, and a parking area in the northwest corner of the property. A storage trailer and portable toilet were then installed in the prepared headquarters area and electrical service was established. MDNR provided an office trailer and telephone service.

Following the establishment of the site headquarters area, work began on the construction of roads or the improvement of existing roads, to provide access to the proposed locations of monitoring wells. As the drilling program evolved, the need for more and larger drilling equipment made it necessary to enlarge and enhance access to some well locations. Thus, clearing and road improvement activities, especially in the wooded areas to the north of the landfill, occurred concurrently with the installation of monitoring wells.

3.2 FIELD INVESTIGATION PROGRAM

The field investigation program took place at the site from March to August

1985, and consisted of soil borings with split-spoon soil sampling, chemical field screening of soil samples, borehole gamma logging, monitoring-well installation, and groundwater sampling and analysis. A description of the field techniques and results are summarized in the following report sections.

3.2.1 Soil Borings

A total of 13 borings were completed at nine locations on the site (see Figure 2). The purposes of these borings were to: 1) characterize the surficial geology at the site; 2) obtain information on groundwater levels and flow directions; and 3) identify the nature and vertical distribution of groundwater contaminants in the surficial deposits. Single point borings and wells were completed at 4 locations: MW-9, MW-11, MW-12, and MW-16. Cluster wells consisting of a shallow (S) and deep (D) well were proposed at 5 locations and completed at 4 locations: MW-10, MW-14, MW-15 and MW-17. Drilling difficulties resulted in the abandonment of MW-13S, and only a deep boring, MW-13D, was successfully completed at this location. A description of the purpose of each boring has been completed by Ms. B. Mursch, MDNR, and is summarized in Table 1.

Due to difficult drilling conditions and the presence of potentially explosive methane gas at the northeastern corner of the site, several drilling methods were used to complete the boring program. These methods included: hollow-stem

TABLE 1

METAMORA SITE INVESTIGATION
BORING AND MONITORING WELL PURPOSE

Well No.	Depth	Purpose
MW-9	S	Geology; groundwater level and flow direction; upgradient water quality.
MW-10S	S	Geology; groundwater level and flow direction; upgradient water quality.
MW-10D	D	Geology; groundwater level and flow direction; upgradient water quality; clay elevation.
MW-11	S	Geology; groundwater level and flow direction.
MW-12	S	Geology; groundwater level and flow direction.
MW-13S*	S	Geology; shallow water quality; groundwater level and flow direction.
MW-13D	D	Geology; deep water quality; groundwater level and flow direction; clay elevation.
MW-14S	S	Geology; shallow water quality; groundwater level and flow direction.
MW-14D	D	Geology; deep water quality; groundwater level and flow direction; clay elevation.
MW-15S	S	Geology; shallow water quality; groundwater level and flow direction.
MW-15D	D	Geology; deep water quality; groundwater level and flow direction; clay elevation.
MW-16	S	Geology; groundwater level and flow direction; shallow water quality.
MW-17S	S	Geology; shallow water quality; groundwater level and flow direction.
MW-17D	D	Geology; deep water quality; groundwater level and flow direction.

S = shallow

D = deep

*Proposed, but not completed.

augers; mud-rotary; casing-advancer; and wash-and-drive techniques. The unsaturated soil zone at the site consists primarily of a mixture of sand, gravel and cobbles, and ranges in apparent thickness from 60 to 140 ft. Penetration of this thick, coarse, dry soil zone was extremely difficult due to loss of drilling-water circulation, jamming and breaking of tools in the borehole by cobbles and small boulders, and difficulty penetrating large boulders. Several drilling methods were attempted until a successful combination of techniques was established for the site. A chronological summary of these drilling techniques is presented below.

3.2.1.1 Hollow-Stem Augers. Initially the drilling program employed hollow-stem auger borings with split-spoon sampling at 10-ft intervals. Borings MW-9 and MW-10S were successfully completed with this method. Hollow-stem auger borings were attempted at MW-10D, MW-11 and MW-13, but difficulties with penetration, methane gas in MW-13, and auger removal resulted in abandonment of these borings. Evaluation of the suitability of the hollow-stem auger technique by Jordan and MDNR staff determined that this technique was inappropriate for the site conditions. In late April, 1985, the hollow-stem auger method was replaced by a combination of mud-rotary pilot holes in the unsaturated zone and completion of the borings with the casing-advancer method. It was decided that the mud-rotary method would provide significantly more power to penetrate the coarse soils, and that the use of drilling mud would help to control the methane gas problem.

3.2.1.2 Mud-Rotary Pilot Holes. In early May, a mud-rotary rig was mobilized to the site and an un-cased 7-7/8-in. mud-rotary hole was drilled at MW-13D to

evaluate the suitability of this technique. MW-13D was successfully drilled to a depth of 179 ft through both the unsaturated and saturated zones and split-spoon samples were taken at 10-ft intervals in the saturated zone. After completion of this boring, the drilling method was modified to include 7-7/8-in. mud-rotary pilot holes terminating approximately 10 ft above the water table followed by installation of 5-in. PVC casing in the pilot hole. Each boring was to be advanced with a 4-in. diameter casing-advancer into the saturated zone and terminated at the desired depth. Split-spoon samples were to be taken at 10-ft intervals in one pilot hole at each location, and in all borings.

The mud-rotary holes provided a better method of penetrating the unsaturated soils, but the MDNR did not want to use mud in the saturated zone due to concerns that the bentonite drilling mud might affect determinations of both the permeability of the soils and chemical quality of the groundwater in this zone. As a result, the choice was made to complete the borings with the casing-advancer method and to use water to remove soil cuttings. 7-7/8-in. mud-rotary pilot holes were completed at MW-12 and MW-13S, and 5-in. PVC casings were installed. Attempts to advance MW-13S using the casing-advancer below the pilot hole were not successful due to breaking and bending of the PVC pilot casing, and breaking of drilling tools and casing. After several attempts with both 4-in. and 3-in. casing, MW-13S was abandoned. MW-12 was completed using a 3-in. diameter casing-advancer and a monitoring well was installed.

Poor drilling progress on the subsequent pilot holes, and problems with the bending and breaking of the 5-in. PVC casing resulted in the decision by MDNR, Jordan, and J. Mathes & Associates to employ a larger, more powerful mud-rotary rig to drill 8-3/4-in. diameter borings, and to switch to a rigid 6-in. steel casing for permanent casing in the pilot holes. Additionally, due to the poor rate of success with the casing-advancer method in MW-13 and MW-14, MDNR and Jordan decided to attempt to use the wash and drive method to complete the borings.

3.2.1.3 Mud-Rotary/Wash-and-Drive. In early July, a large mud-rotary rig was mobilized to the site and in subsequent borings 6-in. steel casing was used instead of the PVC casing. Split-spoon samples were taken at 10-ft intervals in a mud-rotary pilot hole at each of the remaining five locations on site. Mud-rotary pilot borings were completed at MW-10D, MW-11, MW-14, MW-15, MW-16 and MW-17 locations. Following the completion of each pilot hole, the wash-and-drive method was used to complete the boring into the saturated zone. Due to the inherent slow drilling rate of the wash-and-drive method, an additional rig was mobilized to the site in late July to assist in the completion of the wash-and-drive borings. In general, 3-in. casing was used to complete the shallow borings, and 4-in. casing was used to complete the deeper borings. Split-spoon samples were taken at 10-ft intervals in the saturated zone in all wash-and-drive borings. The drilling program was completed in mid-August, 1985. A summary of the boring depths, drilling techniques and well installations is presented in Table 2.

TABLE 2

NETAMORA SITE INVESTIGATION
BORING DATA SUMMARY

BORING NO.	BOTTOM OF BORING (FT)	DRILLING METHOD	NUMBER OF SPLIT-SPOON SAMPLES	NUMBER OF SAMPLES CHEMICALLY SCREENED	GAMMA LOG INTERVAL (FT)	MONITORED ZONE (FT)
MW-9	133.5	hollow-stem augers	13	*	--	133.5-128.3
MW-10S	123.5	hollow-stem augers	12	*	--	123-119
MW-10D (pilot)	100	mud-rotary;	0	0	--	175-170
MW-10D	187.7	wash/drive	8	6	100-174	
MW-11	135	hollow-stem augers	13	0	--	No well installed.
MW-11A (pilot)	100	mud-rotary	10	0	--	
MW-11A	139.75	wash/drive	4	4	--	139-114
MW-12 (pilot)	98	mud-rotary;	10	0	--	
MW-12	129.5	casing advancer	3	3 0	--	127-99
MW-13	143.5	hollow stem augers	14	0	--	No well installed.
MW-13S (pilot)	138	mud-rotary;	0	0	--	No well installed.
MW-13S	138	casing advancer	0	0	--	No well installed.
MW-13D	179	mud-rotary	4	3	0-179	161-159
MW-14S (pilot)	130	mud-rotary;	1	0	--	
MW-14S	169	casing advancer; wash/drive	6	6	102-167	148-139

TABLE 2 (Continued)

METAMORA SITE INVESTIGATION
BORING DATA SUMMARY

BORING NO.	BOTTOM OF BORING (FT)	DRILLING METHOD	NUMBER OF SPLIT-SPOON SAMPLES	NUMBER OF SAMPLES CHEMICALLY SCREENED	GAMMA LOG INTERVAL (FT)	MONITORED ZONE (FT)
MW-14D (pilot)	130	mud rotary;	0	--	--	
MW-14D	159	wash/drive	3	2	--	158-156
MW-15S (pilot)	110	mud rotary;	11	--	--	
MW-15S	124	wash/drive	1	1	--	123-106
MW-15D (pilot)	114	mud rotary;	0	--	--	
MW-15D	151	wash/drive	4	4	151-114	132-127
MW-16 (pilot)	90	mud rotary;	9	--	--	
MW-16	110	wash/drive	2	2	--	110-99
MW-17S (pilot)	55	mud rotary;	0	--	--	
MW-17S	74	wash/drive	2	2	--	71-55
MW-17D (pilot)	55	mud rotary;	5	--	--	
MW-17D	121.5	wash/drive	8	7	117-55	116-106

* No OVA results obtained; 7 samples obtained prior to OVA screening program.

During the drilling program, the ambient air was monitored frequently with both an HNU photoionization meter and an explosivity meter for health and safety of onsite personnel. Decontamination of all drilling and sampling equipment was performed as outlined in the Work Plan. Drilling muds, cuttings and wash water were collected in 55-gal. drums. An Organic Vapor Analyzer (OVA) was used to screen samples from each drum for volatile organics to determine if the material could be disposed of onsite or required storage pending later disposal.

3.2.2 Soil Samples

Split-spoon soil samples were taken at 10-ft intervals in the unsaturated zone in one pilot hole boring at each of the nine locations, and at 10-ft intervals in all of the borings in the saturated zone. All soil samples taken from the borings were visually described and scanned with an HNU photoionization meter for the presence of detectable volatile organic compounds. In addition, soil samples from the saturated zone were also screened for organic compounds with an on-site OVA. Composite soil samples were placed in 40 ml volatile organic analyte sample vials and samples of the headspace above the soils were withdrawn and analyzed. Where sufficient quantities were obtained, soil samples were also analyzed for pH and conductivity. The purpose of this chemical analysis of the saturated soil sample was to assist in the evaluation of the vertical distribution of contamination in the boring. This chemical screening information, together with geologic information, was used to determine the depth of the well screen placement. The results of the chemical screening of the saturated soil samples are summarized in Table 3.

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TABLE 3
METAMORA SITE INVESTIGATION.
SOIL SAMPLES - CHEMICAL SCREENING RESULTS

WELL NO.	SAMPLE NO.	DEPTH (Feet)	JAR HEAD-SPACE HNU READING (ppm)	BACKGROUND HNU READINGS (ppm)	OVA SCREENING RESULTS	pH	CONDUCTIVITY (μmho/cm)
MW-10D	S-1	110-111	0.3	0.3	*	8.7	120
	S-2	120-120.5	0.3	0.3	*	9.0	86
	S-3	130-130.75	0.3	0.3	*	8.5	149
	S-4	140-141	0.5	0	ND	8.7	100
	S-5	(150-160) wash	--	--	*	--	--
	S-6	no recovery	--	--	--	--	--
	S-7	163.5-163	0.5	0	*	8.5	115
	S-8	170-170.9	--	--	--	--	--
MW-11	S-11	110-111.5	0.5	0.5	ND	8.5	222
	S-12	120-121.5	0.5	0.5	ND	8.6	208
	S-13	130-131	0.5	0.5	*	8.2	389
	S-14	134-136	0.5	0.5	*	8.5	170
MW-12	S-11	107.5-109	<1	<1	ND	8.3	149
	S-12	118-119.5	<1	<1	ND	8.6	133
	S-13	128-129.5	0.5	<1	ND	8.5	145
MW-13D	S-1	148-149.5	0.5	0.5	ND	9.1	313
	S-2	158-160	0.5	0.5	ND	8.7	130
	S-3	168-169.5	0.5	0.5	ND	8.6	142
	S-4	178-179.5	--	--	--	8.6	69
MW-14S	S-14	138-139	2.0	2.0	*	8.7	128
	S-15	148-149.5	4.0	2.0	*	8.7	130
	S-16	158-159.5	2.0	2.0	*	8.5	183
	S-17	158-160	2.0	2.0	*	8.4	168
	S-18	159.5-160.5	2.0	2.0	*	8.4	285
	S-19	167.7-169.7	2.0	2.0	ND	8.5	128
MW-14D	S-1	140-140.5	0.5	0.5	ND	--	--
	S-2	no recovery	--	--	--	--	--
	S-3	160-161	0.5	0.5	ND	7.9	395
MW-15S	S-12	121-122	0.3	0.3	*	--	--
MW-15D	S-1	120-121.5	0.3	0.3	*	8.5	101
	S-2	130-130.6	0.3	0.3	*	--	--
	S-3	140-140.5	0.3	0.3	ND	--	--
	S-4	150-151	0.3	0.3	*	8.6	75
MW-16	S-10	100-100.7	0.5	0.5	*	8.9	65
	S-11	110-111.7	0.5	0.5	*	8.4	162
MW-17S	S-1	60-62	7.5	0.6	*	8.4	125
	S-2	70-71	0.3	0.3	*	8.4	125

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TABLE 3 (Continued)

WELL NO.	SAMPLE NO.	DEPTH (Feet)	JAR HEAD- SPACE HNU READING (ppm)	BACKGROUND HNU READINGS (ppm)	OVA SCREENING RESULTS	pH	CONDUCT- TIVITY (μ mho/cm)
MW-17D	S-6B	58.5-60	1.0	0.3	*	7.9	218
	S-7		1.0	0.3	ND	8.1	161
	S-8	80-81.3	1.0	0.3	ND	7.9	182
	S-9	89.5-91	1.0	0.3	ND	7.9	164
	S-10	100	0.3	0.3	*	7.8	186
	S-11	110-111.5	0.3	0.3	*	8.1	174
	S-12	120-121.5	0.3	0.3	*	7.3	4

ND - No significant reading above background.

* - Trace contamination detected.

3.2.3 Gamma Logs

After drilling was completed, and prior to well installation, gamma logging was performed in each deep cluster boring. Two existing wells, MW-5 and MW-8, were also gamma-logged.

Gamma logs were obtained from five borings: MW-10D, MW-13D, MW-14S, MW-15D and MW-17D. Gamma logs provided information that aided in the definition of the subsurface geology and in the determination of well screen depth and interval. With the exception of MW-13D, discrete gamma logging was performed with a Keck Model 1000 gamma log instrument. A continuous gamma log was obtained for MW-13D by Keck staff with a Keck Model SR-5000 gamma log instrument. Ms. Beth Mursch, MDNR, supervised the gamma logging at MW-10D, MW-15D, and MW-17D. Ms. Mursch also gamma-logged an existing well, MW-8. In general, comparison of the gamma logs to split-spoon soil samples from the borings showed reasonably good correlation between grain size variations and gamma counts per minute. The logs were useful in further defining or confirming the contact between the sands and gravels and the clay-silt and till units. Correlations of gamma logs and split-spoon samples in the heterogeneous unsaturated zone were less reliable. This may be due to more closely spaced changes in stratigraphy or perched water conditions. The results of the gamma logging are presented on the Composite Boring Logs (Appendix B).

3.2.4 Monitoring Well Installation

A total of 13 monitoring wells were installed at nine locations at the site. Single, shallow monitoring wells were installed at 4 locations: MW-9, MW-10, MW-11 and MW-16. Well clusters consisting of both deep and shallow wells were installed in adjacent separate borings at 4 locations: MW-10, MW-14, MW-15 and MW-17. A single deep well was installed at MW-13; the shallow boring was abandoned due to drilling difficulties. The monitoring wells ranged in depth from 71 to 175 feet below the ground surface.

Monitoring wells were constructed of 2-in. I.D. flush-threaded or 2-in. I.D. coupled galvanized steel riser pipe. Stainless steel well screens were welded to the bottom of the riser pipes and were approximately 2.5 to 3 ft in length. Well screens installed in auger borings were backfilled by the caving of the natural soil materials at the screen location. The screens for wells installed in cased borings were backfilled with gravel/sand pack if the natural soil was unsuitably fine-grained, or by caving of the natural soil materials when suitable coarse material existed at the screen depth. The annular space between the riser pipe and the borehole was backfilled to a minimum of 1 ft above the screen. The remaining annular space was filled with bentonite pellets and/or bentonite slurry.

A protective steel casing with a locking cap was placed over each well and sealed to approximately 3 ft below the ground surface with cement grout. At the completion of the drilling program, the monitoring wells were developed with compressed air to remove any fine sediment from the well screen. Ground

surface and top-of-casing elevations were surveyed to the nearest 0.01 ft by MDNR. Well installation details are recorded on the composite boring logs (Appendix B). Water level measurements obtained from these wells and existing wells during the Site Investigation are presented in Tables 4 and 5.

3.2.5 Groundwater Sampling

From August 26 to 29, 1985, groundwater samples were collected from 19 monitoring wells at the Metamora Site. Wells were purged by Jordan and MDNR personnel prior to sampling. Water samples were collected by Jordan personnel for analyses for both inorganic and organic parameters. A summary of sampling dates and equipment utilized is presented on Table 6. Samples were analyzed at Jordan's laboratory according to procedures outlined in the Work Plan. A summary of these procedures is included in Appendix D.

TABLE 4
WATER LEVEL ELEVATIONS*
EXISTING WELLS

WELL NO.	ELEVATION TOC ⁽¹⁾	12-29-78	6-25-85	8-26/29/85	9-16-85	10-2-85
MW-1	1076.48	1000.99	1000.77	1004.15	1004.28	1005.04
MW-2	1089.74	1003.87	1004.70	--	1008.04	--
MW-3	1069.62	1000.24	1000.37	1002.93	1003.12	1004.08
MW-4	1101.65	1078.90	--	1077.72	1079.25	1079.00
MW-5	1147.09	--	995.82	998.23	998.89	--
MW-6	1087.98	--	1000.29	1002.66	1003.78	1003.41
MW-7	1089.36	--	1001.02	1003.55	1004.66	1005.36
MW-8	1097.30	--	1000.37	1002.96	1003.70	1004.12

TABLE 5
WATER LEVEL ELEVATIONS*
NEW WELLS

WELL NO.	ELEVATION TOC	5-22-85	6-1-85	6-25-85	7-14-85	8-26/29	9-11-85	9-16-85	10-2-85
MW-9	1131.13	--	--	1007.73	1008.72	1008.93	1008.53	1008.63	1009.46
MW-10S	1120.13	--	--	1006.03	1006.72	1001.65	1006.63	1007.03	1007.55
MW-10D	1118.79	--	--	--	--	1006.44	1006.59	1006.99	1007.46
MW-11	1114.20	--	--	--	--	1005.73	1005.90	1006.30	1006.86
MW-12	1114.24	--	--	1008.84	--	1006.29	1006.44	1006.54	1008.00
MW-13	1139.84	1000.24	1003.44	1003.84	1006.61	1005.06	1005.14	1005.34	1005.36
MW-14S	1145.53	--	--	--	--	1003.63	1003.63	1003.73	1003.95
MW-14D	1147.61	--	--	--	--	1003.81	1003.81	1003.91	1004.09
MW-15S	1125.83	--	--	--	--	1006.88	1004.23	1004.43	1005.18
MW-15D	1126.95	--	--	--	--	--	1004.15	1004.05	1004.15
MW-16	1103.94	--	--	--	--	--	1003.21	1002.74	1003.14
MW-17S	1072.09	--	--	--	--	--	1007.99	1008.49	1008.69
MW-17D	1073.35	--	--	--	--	--	1005.60	1005.65	1006.00

(1) TOC = Top of Casing

*All measurements made from TOC and converted to elevation above mean sea level.

TABLE 6
GROUNDWATER SAMPLING DATES AND EQUIPMENT USED FOR
PURGING AND SAMPLING GROUNDWATER FOR ORGANIC AND INORGANIC ANALYSIS

WELL	DATE	PURGE	ORGANICS	INORGANICS
1	8/29/85	ISCO/BAILER	BAILER	BAILER
3	8/29/85	ISCO	BAILER	ISCO
4	8/27/85	BAILER (DRY)	BAILER	BAILER
6	8/26/85	KECK	KECK	KECK
7	8/26/85	KECK	KECK	KECK
8	8/28/85	ISCO	BAILER	ISCO
9	8/26/85	QED	QED	QED
10S	8/26/85	QED	QED	QED
10D	8/27/85	QED	QED	QED
11	8/27/85	QED	QED	QED
12	8/27/85	QED	QED	QED
13	8/28/85	KECK (DRY)	BAILER	BAILER
14S	8/27/85	KECK	KECK	KECK
14D	8/27/85	KECK	KECK	KECK
15S	8/27/85	KECK	KECK	KECK
15D	8/27/85	KECK	KECK	KECK
16	8/27/85	KECK	KECK	KECK
17S	8/27/85	KECK	KECK	KECK
17D	8/27/85	KECK	KECK	KECK

BAILER Stainless steel and Teflon (1 liter) with bottom-emptying device.
New cord used at each well.

ISCO Stainless steel, silicone rubber, polyethylene bladder pump.

KECK Stainless steel progressive cavity (helical rotor) pump.

QED Stainless steel and Teflon bladder pump.

DRY Pumped dry during purging.

4.0 SITE CHARACTERIZATION

4.1 REGIONAL CHARACTERIZATION

4.1.1 Regional Geology

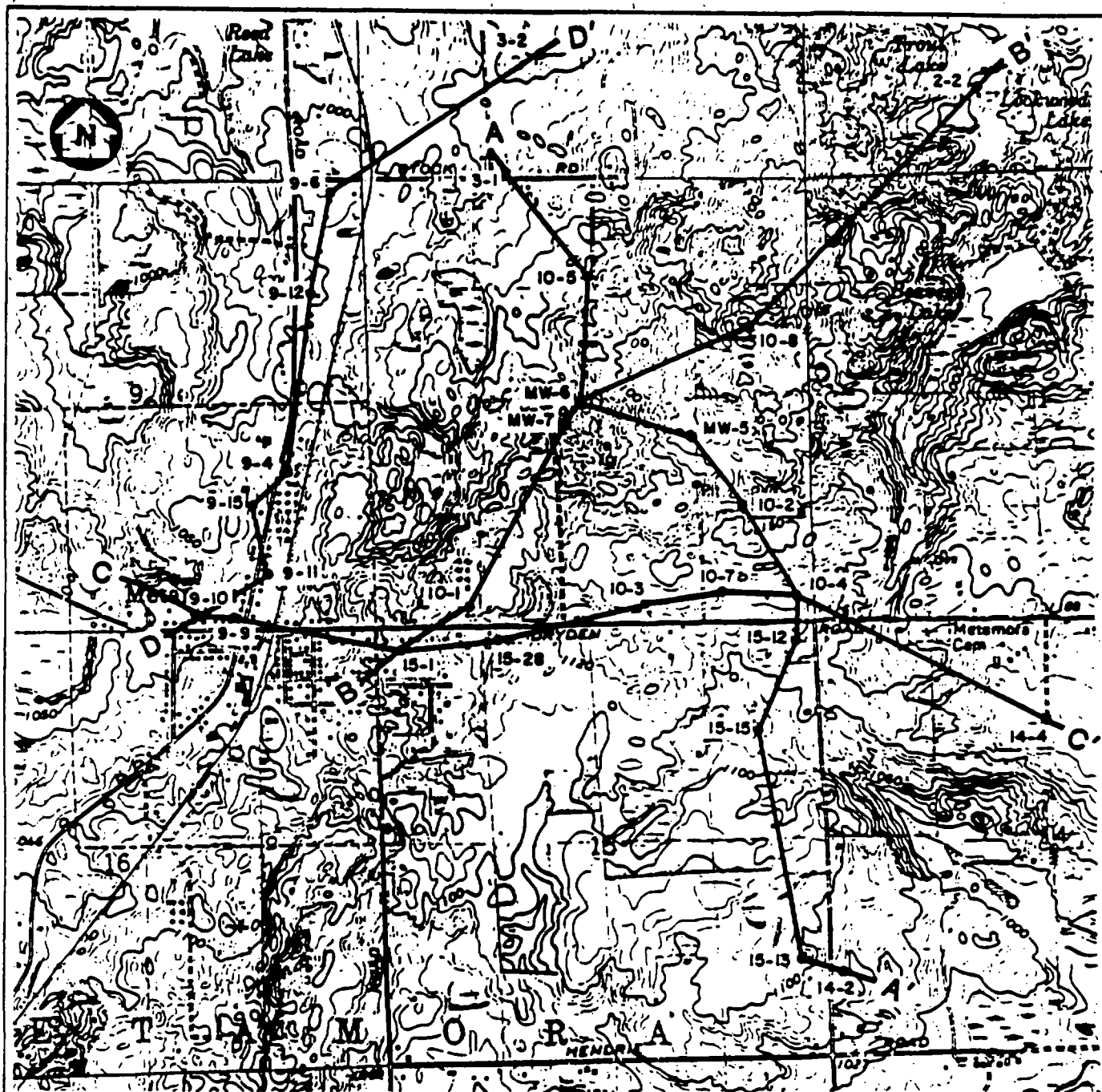
Metamora Township is located on the eastern flank of the Michigan basin. Bedrock in the area consists of sedimentary rocks of Mississippian age (deposited approximately 330 million years before the present). More than 300 ft of glacial drift overlie bedrock. The Marshall Sandstone, the bedrock type underlying glacial drift in Metamora Township, is approximately 100 feet thick and dips gently northwestward toward the center of the basin. The 1,000-ft thick Coldwater Shale generally underlies the Marshall Sandstone but is the uppermost bedrock unit in the area southeast of Metamora Township. To the northwest, the Marshall Sandstone is overlain by the younger Napoleon Sandstone and Michigan Formation. A bedrock topographic high trends in a northeast-southwest direction through the area, oriented parallel to the strike of the Marshall Sandstone. The maximum elevation of bedrock in the area is about 850 ft MSL, based on interpretation of domestic well logs.

The thick mantle of glacial drift overlying bedrock consists of unconsolidated till, outwash and ice-contact deposits. Regional geologic profiles of the glacial deposits in Metamora Township have been interpreted from drillers logs that were obtained from MDNR files. The location of the four regional profiles, A-A', B-B', C-C' and D-D' are shown in Figure 3 and the profiles

are presented in Figures 4 and 5. The logs are presented in Appendix C. The borehole locations, the lithologic descriptions and the elevational data obtained from the logs may be subject to some interpretation or error. However, there appears to be reasonable correlation of strata between boreholes in all four profiles.

The glacial deposits in the study region are primarily the result of glacial events that occurred during Late Wisconsinian times. Maximum ice advance during that period (about 18,000 years before present) covered in the entire state of Michigan. Deglaciation occurred rapidly from 16,000 to 15,600 years ago, followed by ice readvance. The standstill periods during the final retreat of this readvance are marked by terminal moraines. The coarse-textured till present at the Metamora site is associated with the outer Charlotte moraine deposited by the Saginaw sublobe of the Huron-Erie lobe. Subsequent to glaciation of the Metamora region, the glacial meltwater and outwash associated with the Saginaw sublobe was transported southwestward via the glacial Grand River.

The four regional profiles depicted in Figures 4 and 5 provide descriptions of the glacial deposits. In most areas it appears that glacial till overlies bedrock. In several areas to the northeast, southeast and west of the site, sand and gravel deposits occur between the till and bedrock. These lower sands and gravels were probably deposited in front of the advancing glacier and subsequently overridden and preserved by the basal till.



APPROXIMATE SCALE



FIGURE 3
REGIONAL GEOLOGIC PROFILES
LOCATION MAP

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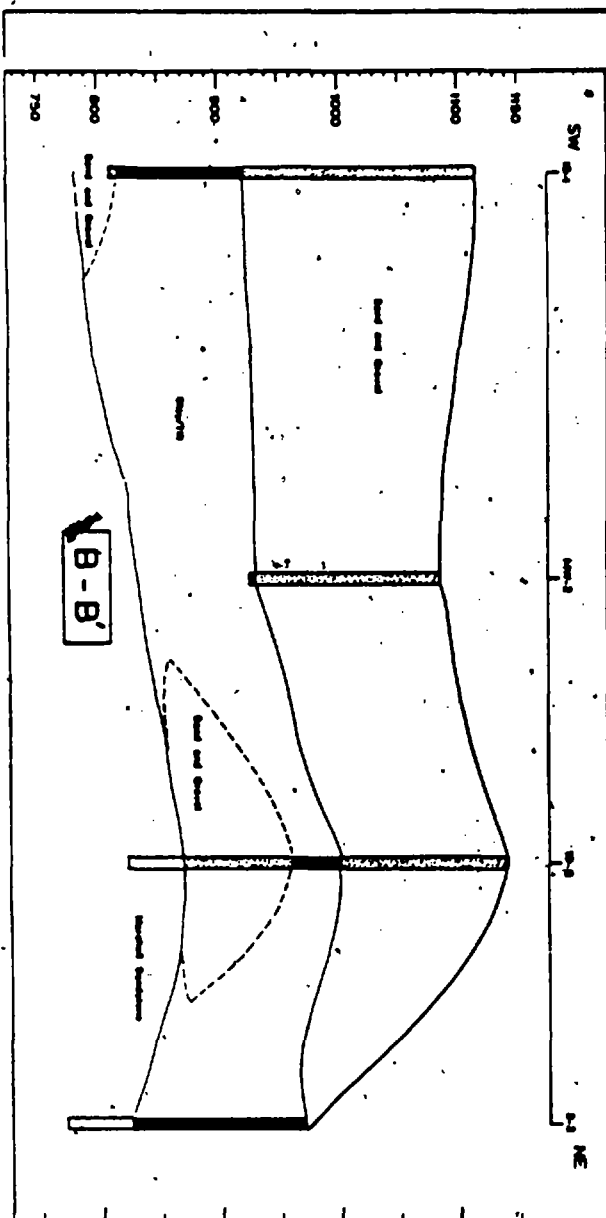
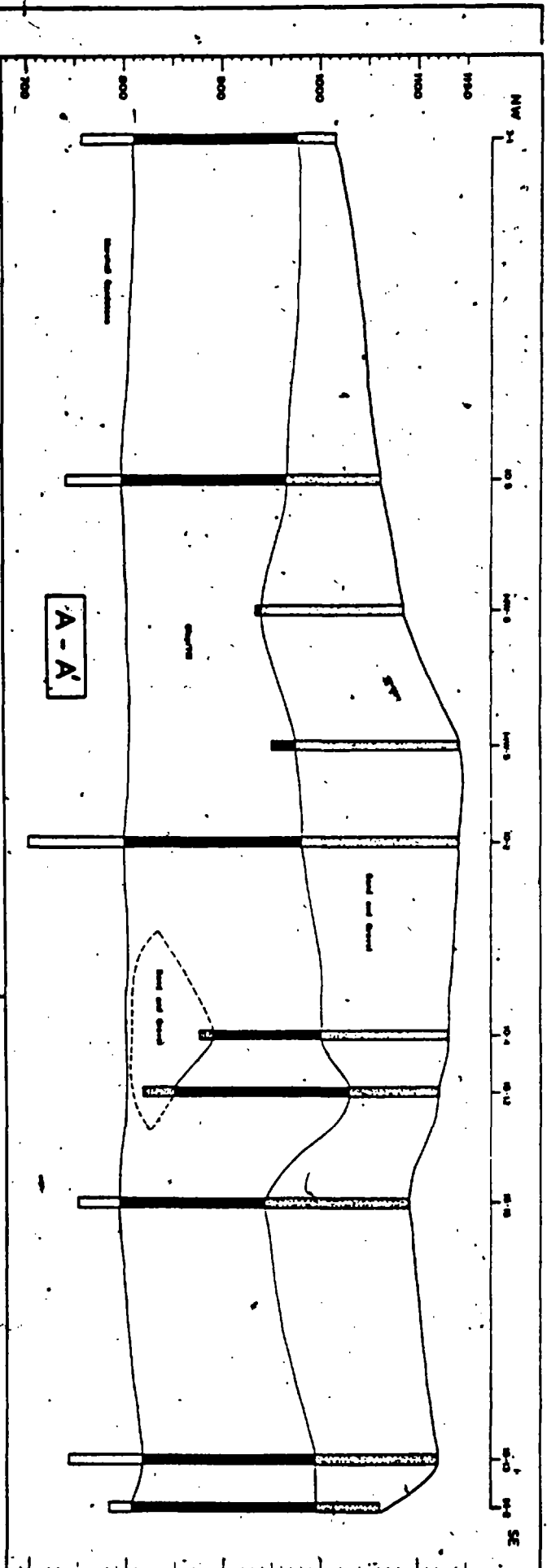
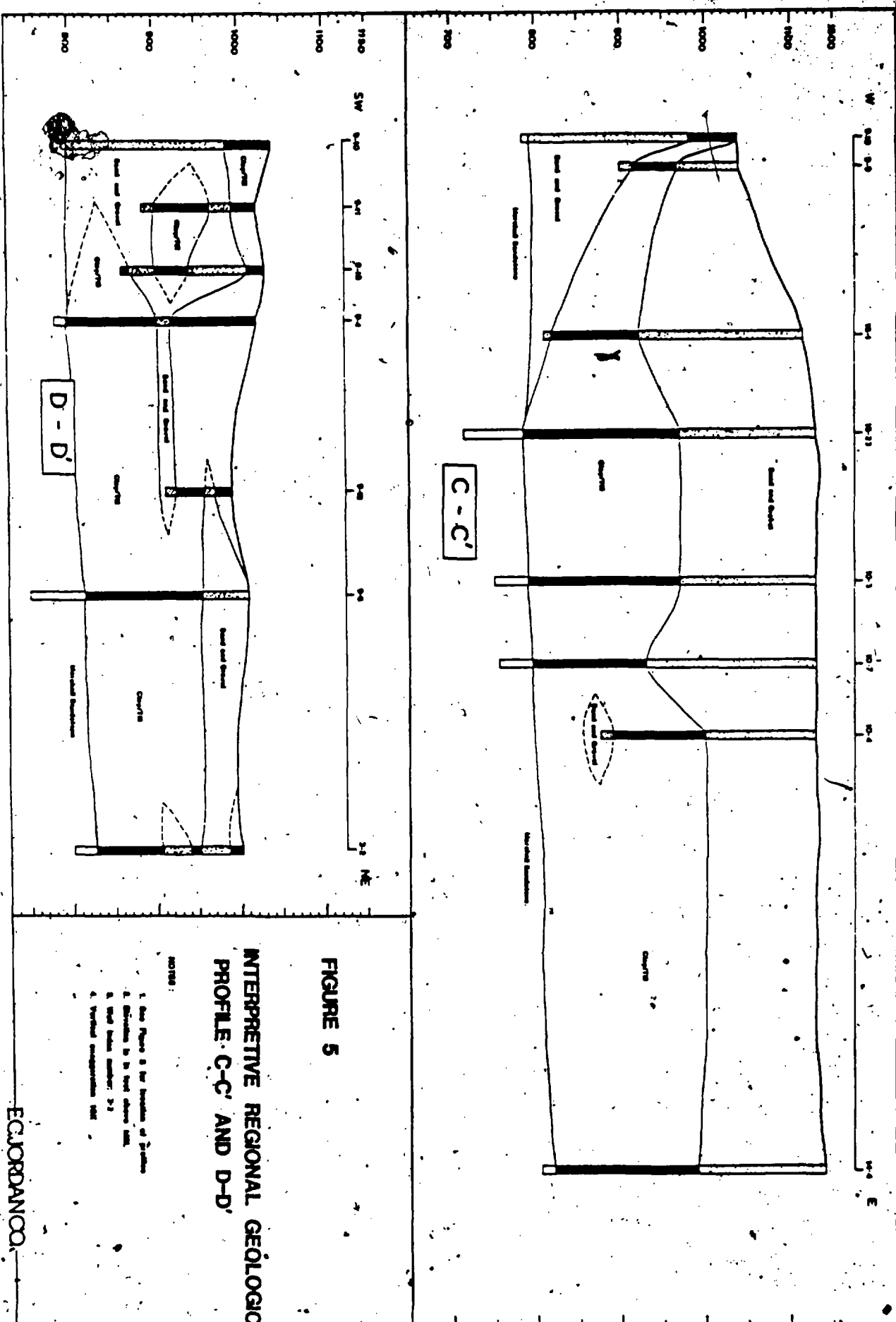


FIGURE 4
INTERPRETIVE REGIONAL GEOLOGIC
PROFILE A-A' AND B-B'

- Legend:**
- 1. See Figure 3 for location of profile
 - 2. Shaded to 10 feet above sea
 - 3. Sand (see section 1-4)
 - 4. Vertical exaggeration 1:1



Profile D-D', which is oriented north-south along Metamora Road, presents a different geology than the other sections in that there is substantial interstratification of glacial till and outwash sand and gravel. The characteristics of these deposits suggest that glacial meltwater played a role in erosion and redeposition of previously deposited sediments.

The hummocky topography of the region (see Figure 1) is caused primarily by melting of stagnant ice which may have been under, against or on top of the stratified drift. The typical structural features of ice contact sand and gravel deposits are visible on the walls of the gravel pit that is located at the site. These features include channel deposits, graded beds, and slump deposits.

4.1.2 Regional Hydrology

Alteration of the landscape has occurred over the past 14,000 years due to erosion and drainage. The broad northeast-southwest oriented upland that traverses the Metamora area forms the drainage divide between the Flint, Clinton and Belle River Basins. The Metamora site is located in the headwater portion of the Flint River Basin which ultimately drains to Saginaw Bay. River elevations 1.5 miles to the east of the landfill site (South Branch of the Flint River), and 1 mile to the northwest of the landfill (Kintz Creek) are at approximately 930 feet above mean sea level (MSL).

Groundwater in the outwash and ice-contact deposits that overlie the clay-rich till is under watertable conditions (i.e., unconfined). Localized zones of

perched groundwater exist where clay lenses are found at elevations above the water table.

The potentiometric groundwater surface elevation in the bedrock aquifer can be estimated based on drillers logs. The potentiometric surface may range from approximately 1000 to 950 feet above MSL. The hydraulic connection between the bedrock and surficial aquifers is expected to be poor in most places due the suspected presence of the clay-silt till unit as shown on Figures 4 and 5.

4.1.3 Groundwater Use

The Marshall Sandstone is the primary aquifer for the domestic wells in the area. Though the majority of the water supplies in the area tap the Marshall Sandstone bedrock aquifer, a few domestic wells obtain water from the sand and gravel deposits that occur between the till and bedrock. Very few water supplies have been completed in the upper glacial deposits, possibly due to the low yield of this zone. The extreme heterogeneity and the potentially low overall water transmitting capacity of these of these shallow deposits may make them unsuitable for use as a water supply.

4.2 SITE-SPECIFIC CHARACTERIZATION

4.2.1 Site Geology

The surficial deposits at the Metamora site consist of unconsolidated silts,

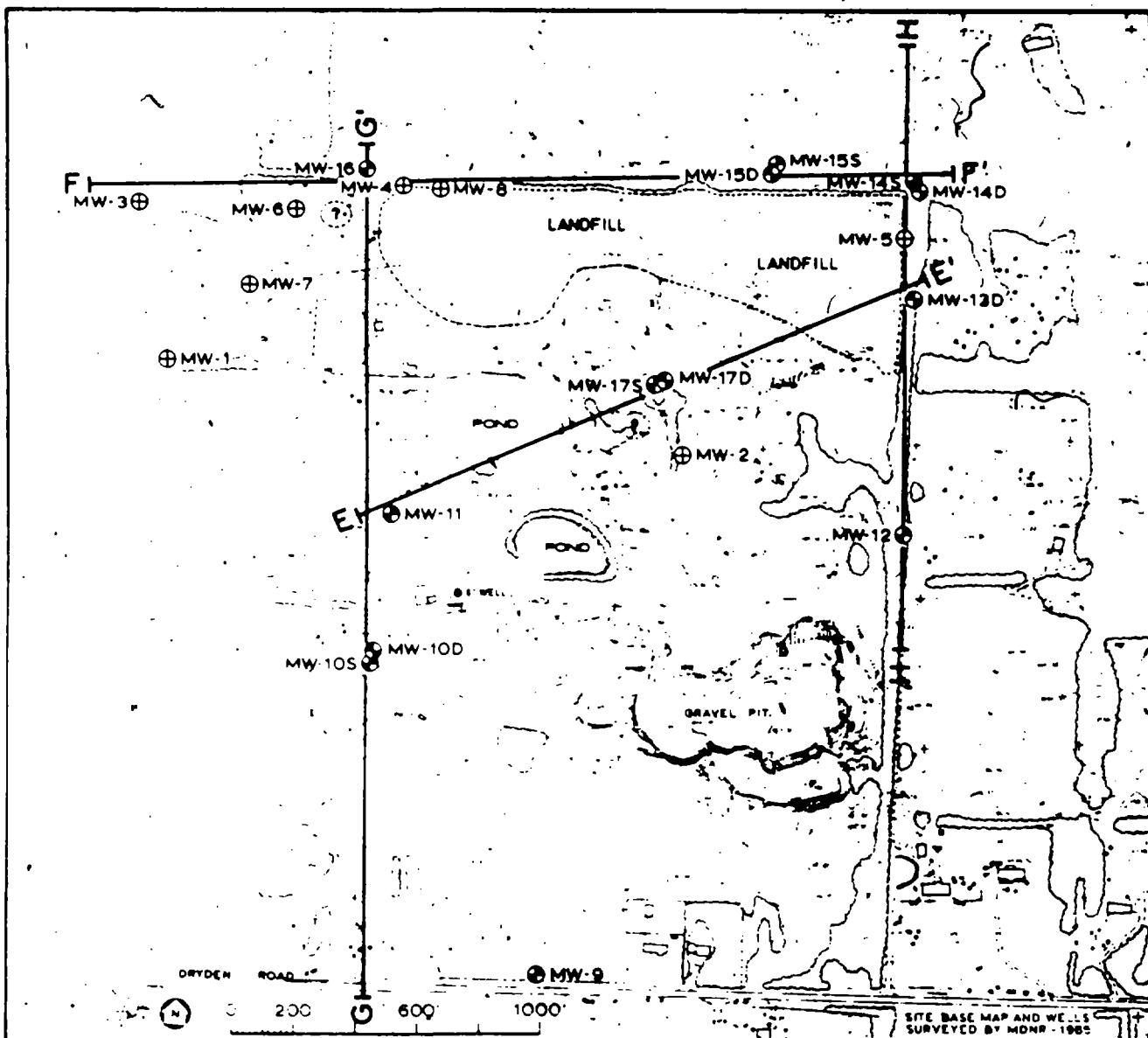
sands, gravels, boulders and glacial till. These deposits are estimated to be 250-300 ft thick, based on interpretation of regional well logs (see Figures 4 and 5). Borings completed during this investigation did not fully penetrate the surficial deposits. The maximum boring depth attained during this investigation was 188 ft at MW-10D, located adjacent to the transfer station access road. The bottom of the boring may be about 120 ft. above the bedrock surface.

Interpretations of the subsurface geology are shown on four geologic profiles presented in Figures 7, 8, 9, and 10. The location of each of the profiles, E-E', F-F', G-G', H-H' is shown on Figure 6. Profiles were constructed with a 5:1 vertical exaggeration. The geologic interpretations of the site presented in these figures are based primarily on borings at nine locations (MW-9 through MW-17) logged by Jordan. Data on existing borings, MW-1 through MW-8, were utilized where reasonable correlations could be made.

The surficial soils are highly variable which lacking obvious stratigraphic continuity across the site, makes subsurface interpretations difficult.

However, in general, three separate geologic units can be defined, although each exhibits variability in geologic materials:

- o a "till-like" gravelly sandy silt to silty sand (ablation or melt-out till);
- o a heterogeneous mixture of sand, gravel, cobbles, boulders and silts; and
- o stratified clay-silt/sand and glacial till.

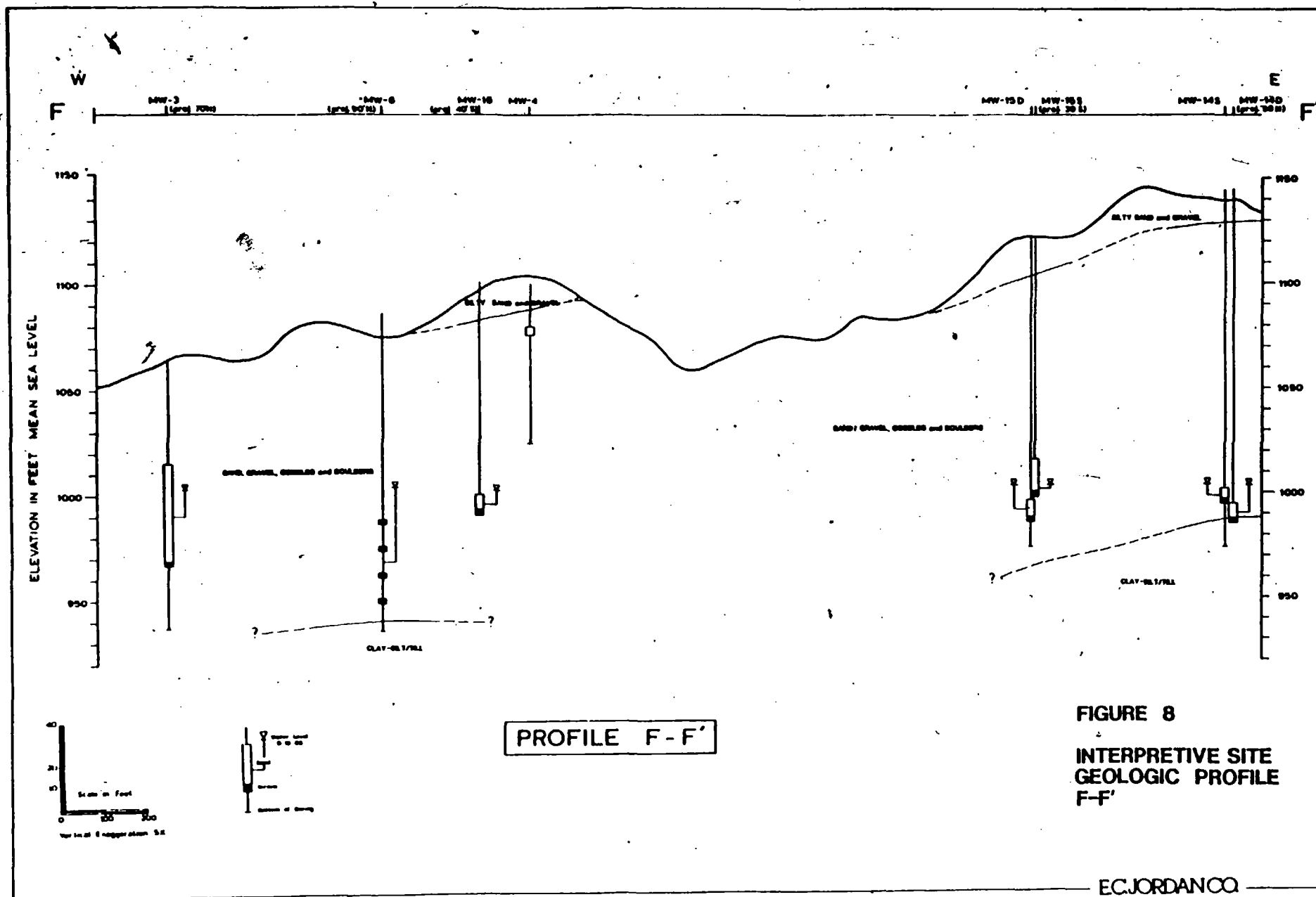


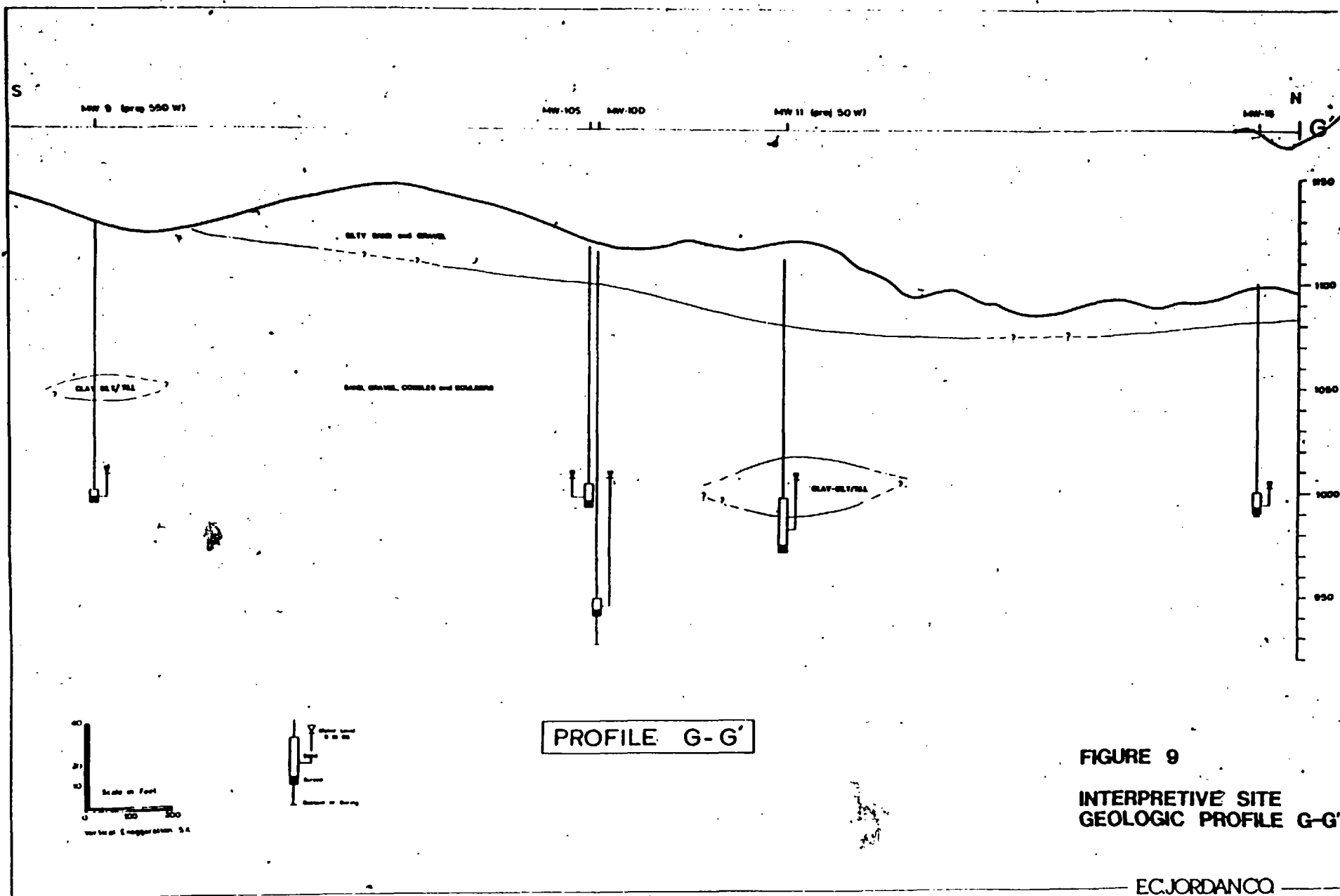
- 7 MAGNETIC ANOMALIES
- ⊕ PREVIOUSLY-EXISTING SITE WELLS
- "SHALLOW" WELLS, THIS INVESTIGATION
- "DEEP" (SOIL) WELLS, THIS INVESTIGATION

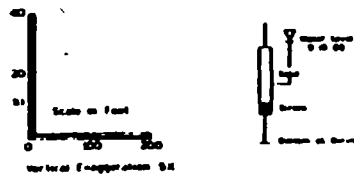
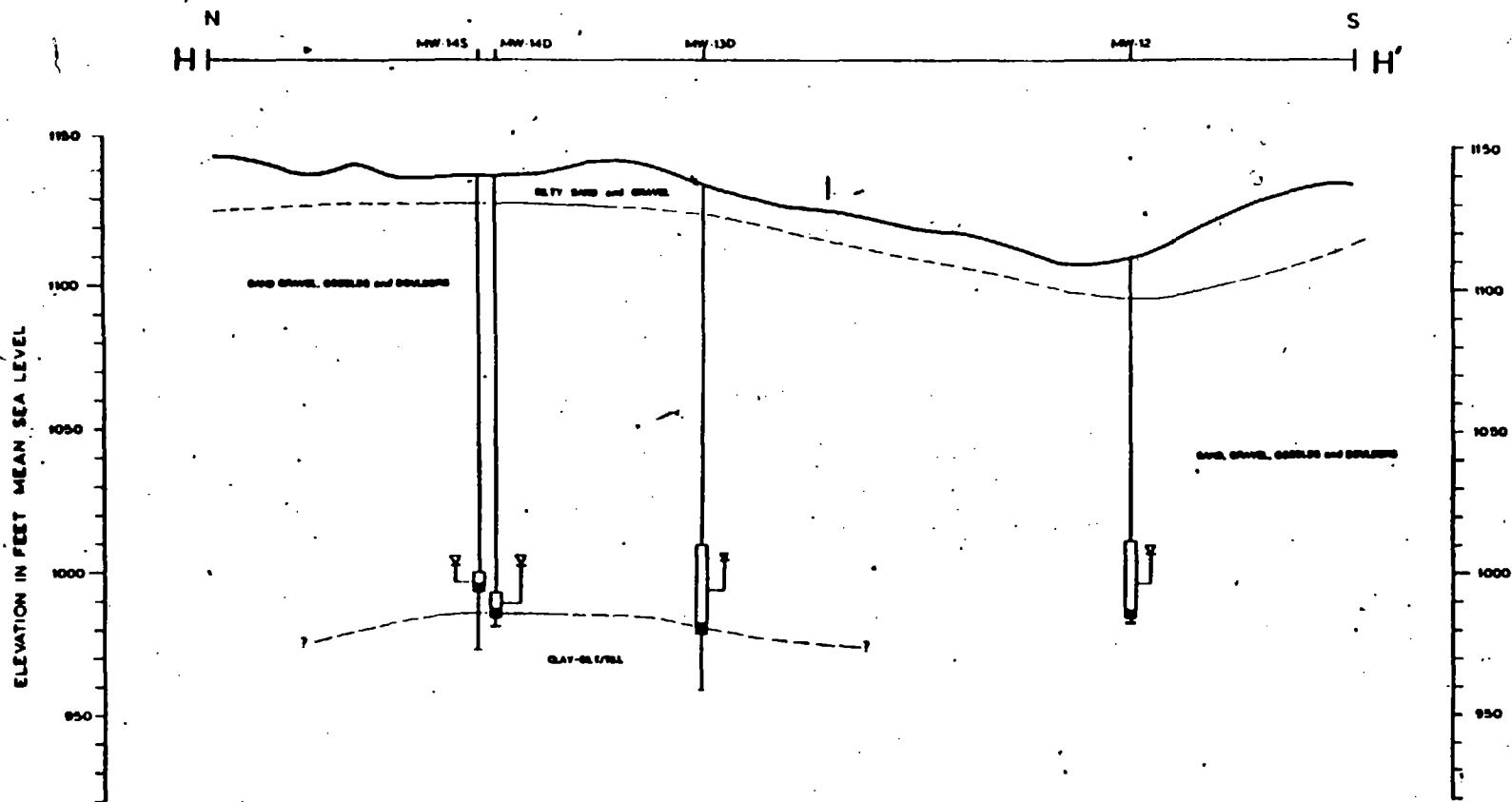
GEOLOGIC PROFILES
ARE PRESENTED ON
FIGURES 7, 8, 9 and 10

FIGURE 6 - SITE AREA
SITE GEOLOGIC PROFILE LOCATIONS

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PROFILE H-H'

FIGURE 10
INTERPRETIVE SITE
GEOLOGIC PROFILE H-H'

ECJORDANCO

Sandy Silt (Ablation or Melt-Out Till). The uppermost surficial unit generally consists of loose, light brown, gravelly, sandy silt. This surficial unit was identified in the majority of the borings completed during this investigation. The thickness of this unit generally ranges from 4 to 16 ft across the site. Sandy-silt was not identified near the ground surface in MW-9, located at the south end of the site. The surficial unit probably represents an ablation or melt-out till that was deposited during the last retreat of glacial ice.

Ice-Contact and Outwash Deposits. Ice-contact and outwash deposits underlie the ablation or melt-out till and comprise the majority of the unsaturated zone on the site. These deposits consist of a poorly-stratified mixture of sand, silts, gravels, cobbles and till layers. Stratigraphy and grain sizes vary considerably over short distances throughout the site.

The thickness of the ice-contact and outwash deposits ranges from approximately 120 ft at MW-15 at the northeast end of the site to greater than 188 ft at MW-10 at the southwest end of the site. Borings at five locations terminated in this unit. These deposits were probably laid down by meltwater and sediment slumping during a period of glacial ice melting. Large volumes of sediments and rapid deposition may account for the extreme heterogeneity of these soils.

Included within this unit are fine sand and silty fine sand layers. These sand layers range in apparent thickness from 10 to 40 ft across the site and occur at variable depths. The fine sand deposits may represent late stage outwash sediments interfingering with the ice contact deposits.

Locally, these coarse-grained soils may be highly permeable, but their extreme heterogeneity (i.e., presence of fine-grained materials) may significantly reduce their overall permeability. Clay lenses and perched water table conditions were commonly encountered in several borings at the site.

Stratified Clay-Silt and Glacial Till. A stratified clayey silt with sand layers, and glacial till have been observed under the sands and gravels in several borings at the site. In general, the stratified clayey silts and sands appear to grade transitionally into the till. In the Site Investigation, four borings (MW-13, MW-14, MW-15 and MW-17) penetrated this stratified unit beneath the sands and gravels. The till unit consists of dense brown or gray gravelly, sandy, silty clay and is commonly overlain by a few feet of the stratified clayey silt and sand. Table 7 tabulates the elevations of the top of this unit in areas where it was identified. At the northeast end of the site, the clayey-silt and till unit was encountered at an elevation of approximately 980 feet above MSL. At MW-16 this unit was encountered at elevation 940 feet above MSL. The continuity of this unit underneath the site is not known. The few data points for the elevation of this unit make interpretations concerning its continuity difficult.

Distinct till layers were also identified in borings MW-9 and MW-11. These till units occur at much higher elevations than the basal clay/till unit and are interpreted to be distinct from that unit. These till layers may represent erosional remnants left by the high velocity deposition of the ice-contact sediments. Alternatively, sands and gravels that underlie these till layers may be significantly older than the ice contact deposits above. It is also

TABLE 7

ELEVATION OF THE TOP OF THE CLAY SILT/TILL UNIT

<u>Boring No</u>	<u>Estimated Elevation in feet above MSL</u>
MW-1	1074-1041
MW-2	984-969
MW-3	1025
MW-4	1076-1024
MW-6	939
MW-7	934
MW-9	deeper than 996
MW-10	deeper than 928
MW-11	1031-979
MW-12	deeper than 984
MW-13	980
MW-14	984
MW-15	985
MW-16	deeper than 990
MW-17	950

NOTE: Elevations based on interpretations of logs for old and new borings on site.

possible that these till layers were deposited contemporaneously with ice contact deposits by slumping or rafting. It seems probable that no matter what their genetic origin, these shallow till layers are probably isolated, discontinuous blocks within the ice contact deposits.

Subsurface information from previous borings and from the borings completed as part of this study is not sufficient to define the genetic relationship and origin of the various clay/silt and till units that were observed at the site.

4.2.2 Site Hydrogeology

The principal source of groundwater recharge at the Metamora site is precipitation. The thick, heterogeneous soils and topographic influences on surface water drainage at the site control the rate and direction of groundwater flow. Localized zones of perched water have been identified at varying depths at the site but the true water table beneath the site is approximately 1000 feet above MSL. The potentiometric surface elevation in the bedrock aquifer appears to exist at about 1000 to 950 feet above MSL, based on regional profiles.

Water level data collected on September 16, 1985 were used to develop the interpretive watertable elevation contours for the surficial aquifer map presented on Figure 11. The water levels used to develop this map were measured primarily in wells installed in the ice-contact and outwash deposits. A compilation of water level measurements from the new and previously existing wells is presented in Tables 4 and 5.

The direction of groundwater flow is/ interpreted to be perpendicular to the water table elevation contours, from higher to lower elevations. Based on the interpretation shown on Figure 11, groundwater at the site flows from the south-central part of the site to the northwest towards MW-11 and MW-16 and to the northeast towards MW-15 and MW-14; a north-trending groundwater divide bisects the site into east and west regimes.

It should also be noted that the groundwater elevation at MW-5 of approximately 999 feet MSL is significantly lower than in the surrounding wells. The exact depth and construction of the well in this boring is not known, so data from MW-5 was not used in developing the interpretative water table contour map.

Multi-level wells were installed at four locations: MW-10, MW-14, MW-15, and MW-17. Slight to very slight downward gradients from the sand and gravel and till deposits were measured in MW-10, MW-14, MW-15, and MW-17. These gradients range from 0.008 at MW-10 to 0.05 at MW-17. The downward vertical gradient may provide a significant flow component at MW-17, where mounding of the groundwater occurs.

The interconnection between the deep surficial units and the Marshall Sandstone has not been evaluated as part of this study.

The extreme heterogeneity of the unconsolidated surficial deposits makes it difficult to determine overall permeabilities from localized well-point measurements. As a result, field measurements of hydraulic conductivity were

not used to evaluate groundwater flow rates at the site. (The hydraulic conductivity is a measure of the capacity of the soils to transmit water and is commonly referred to as the "permeability" of the soils.) Based on the grain sizes it is estimated that the hydraulic conductivity of the ice contact and outwash sands and gravels ranges from approximately 10^{-4} to 10^{-2} cm/sec (about 0.3 ft/day to 30 ft/day). The hydraulic conductivity of the finer grained clay-silt and till units may range from approximately 10^{-7} to 10^{-5} cm/sec (about 0.1 ft/year to 10 ft/year). Additional testing, such as an aquifer pump test, would be necessary to adequately determine the flow characteristics in the surficial aquifer at the site.

5.0 CONTAMINATION

This project also included the collection and analysis of groundwater samples from existing and newly-installed wells. The purposes of this task were to:

- 1) characterize the natural "background" groundwater quality in the area; and
- 2) gain additional information regarding the migration of contaminants from known and suspected waste deposits. This information will be used to help direct a more in-depth assessment of the contamination in the vicinity of the Metamora site (planned for 1986). In the following discussion, parts per million (ppm) and parts per billion (ppb) will be used instead of, respectively, milligrams per liter (mg/l) and micrograms per liter (µg/l) for ease of reference. At the concentrations encountered, the respective units are essentially numerically equal.

Prior sampling (by others) of the eight-previously installed monitoring wells (MW-1 through MW-8) had indicated the presence of several dissolved metals, and certain organic chemicals, principally toluene, benzene, xylene and pyrene. For this study all previously installed wells except MW-2 and MW-5 (due to constrictions in the wells) were resampled in addition to each of the 13 new wells. These groundwater samples were analyzed for the presence of several metals, other inorganic parameters, volatile and semi-volatile organic chemicals, and several general water-quality parameters such as TOC, pH and specific conductivity. The analytical results for the sampling conducted in August 1985 are summarized in Table 8. Table 9 summarizes the range of parameter values determined for the samples as well as the median value for all 19 samples. Figure 12 shows locations and concentrations of contaminants detected at above

TABLE 8
SUMMARY OF ANALYTICAL SAMPLING

Units	Spec. Cond. ¹	pH ¹	Temp ¹	Arsenic ²	Cadmium ²	Calcium ²	Chromium ²	Chromium Hex ²	Copper ²	Iron ²	Lead ²	Magnesium ²	Mercury ²
	µs		°C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	µg/l
MW-1	840	7.0	11.0	<.005	<.002	78	<.005	<.005	<.005	.022	<.020	31	<1.0
MW-3	780	7.4	10.9	<.005	<.002	76	<.005	<.005	.006	.095	<.020	27	<1.0
MW-4	890	6.5	13.4	.12	<.002	140	<.005	<.005	.008	.77	<.020	70	<1.0
MW-6(1,2,3,4) ^a	600	8.2	*	.007	<.002	71	<.005	<.005	<.005	.89	<.020	31	<1.0
MW-6(2,3,4) ^a	610	7.9	*	.006	<.002	74	<.005	<.005	<.005	.65	<.020	31	<1.0
MW-6(3,4) ^a	560	7.4	*	.006	<.002	62	<.005	<.005	<.005	.74	<.020	28	<1.0
MW-7(1,2,3) ^a	640	8.4	*	<.005	<.002	85	<.005	<.005	.044	.045	<.020	30	<1.0
MW-8	920	6.9	13.9	<.005	<.002	17	<.005	<.005	<.005	.27	<.020	36	<1.0
Duplicated MW-8 ^b	920	6.9	13.9	<.005	<.002	19	<.005	<.005	<.005	.26	<.020	37	<1.0
MW-9	680	6.9	14.6	<.005	<.002	99	<.005	<.005	.019	.15	<.020	36	<1.0
Duplicated MW-9 ^b	680	6.9	14.6	<.005	<.002	81	<.005	<.005	<.005	.045	<.020	28	<1.0
				<.005	<.002	82	<.005	<.005	<.005	.044	<.020	29	<1.0
				<.005	<.002	78	<.005	<.005	.009	.032	<.020	28	<1.0
MW-108	890	7.1	12.4	<.005	<.002	120	<.005	<.005	.025	.048	<.020	36	<1.0
MW-100	670	7.6	11.5	<.005	<.002	66	<.005	<.005	.008	.053	<.020	26	<1.0
MW-11	690	7.6	14.4	<.005	<.002	80	<.005	<.005	.017	.030	<.020	31	<1.0
MW-12	600	7.7	14.8	<.005	<.002	65	<.005	<.005	.017	.028	<.020	27	<1.0
MW-13	560	7.7	15.3	<.005	<.002	20	<.005	<.005	.011	.35	<.020	5.3	<1.0
MW-148	800	6.3	*	<.005	<.002	170	<.005	<.005	.027	1.4	<.020	45	<1.0
MW-140	490	6.2	*	<.005	<.002	120	<.005	<.005	.027	.061	.063	36	<1.0
MW-153	880	6.8	*	<.005	<.002	150	<.005	<.005	.015	.18	<.020	39	<1.0
MW-150	640	6.8	*	<.005	<.002	96	<.005	<.005	.006	.032	<.020	39	<1.0
MW-16	543	7.8	*	.009	<.002	26	<.005	<.005	<.005	.056	<.020	38	<1.0
MW-175	630	6.3	*	.14	<.002	83	<.005	<.005	.007	6.2	<.020	36	<1.0
Duplicated MW-175 ^b	630	6.3	*	.11	<.002	79	<.005	<.005	.006	6.7	<.020	35	<1.0
MW-170	410	6.5	*	<.005	<.002	97	<.005	<.005	.009	4.6	<.020	38	<1.0
Blank 1 ^a	*	*	*	<.005	<.002	74	<.005	<.005	.014	.039	<.020	31	<1.0
Blank 2 ^a	*	*	*	<.005	<.002	.11	<.005	<.005	.008	.063	<.020	.070	<1.0
Blank 3 ^a	*	*	*	<.005	<.002	.31	<.005	<.005	.045	.034	<.020	.068	<1.0
Blank 4 ^a	*	*	*	<.005	<.002	.28	<.005	<.005	.005	.040	<.020	.007	<1.0
				<.005	<.002	.29	<.005	<.005	<.005	.094	<.020	.042	<1.0

TABLE 8 (Continued)
SUMMARY OF ANALYTICAL SAMPLING

Units	Nickel ² mg/l	Potassium ² mg/l	Selenium ² mg/l	Sodium ² mg/l	Zinc ² mg/l	Alkalinity CaCO ₃ mg/l	Carbonate mg/l	Bicarbonate mg/l	Chloride mg/l	Ammonia-N mg/l	TKN mg/l	Phosphorus-P ³ mg/l
MW-1	<.020	3.8	<.005	3.5	2.0	1300	.30	640	11	<1	1.3	1.2
MW-3	<.020	1.0	<.005	4.8	.89	750	.49	420	14	<1	<1	<.05
						770	.50	430				
MW-4	.20	41	<.005	110	4.2	1500	.08	530	200	63	78	.35
									200		78	
MW-6(1,2,3,4) ⁴	<.020	.84	<.005	5.1	<.005	250	1.1	150	15	<1	<1	<.050
MW-6(2,3,4) ⁴	<.020	.90	<.005	7.0	<.005	260	.56	150	15	<1	*	.06
MW-6(3,4) ⁴	<.020	1.0	<.005	7.0	<.005	250	.16	140	14	<1	<1	.14
MW-7(1,2,3) ⁴	<.020	1.0	<.005	4.5	.042	260	1.8	160	22	<1	<1	<.05
MW-8	<.020	2.2	<.005	13	.049	380	.07	180	24	<1	<1	<.05
	<.020	2.2		11	.049					<1		
Duplicated MW-8 ⁵	<.020	1.6	<.005	10	.048	370	.07	180	25	<1	<1	<.05
										<1		
MW-9	<.020	.72	<.005	2.5	1.9	270	.05	130	3.4	<1	<1	<.05
	<.020	.79		2.8	2.0							
Duplicated MW-9 ⁵	<.020	.82	<.005	2.8	1.9	270	.05	130	3.8	<1	<1	<.05
			<.005									
MW-108	<.020	1.1	<.005	4.7	1.1	250	.08	130	22	<1	<1	.06
MW-10D	<.020	.93	<.005	3.7	1.5	280	.30	160	3.7	<1	<1	<.05
											<1	
MW-11	<.020	.88	<.005	3.5	.39	250	.27	140	12	<1	<1	<.05
MW-12	<.020	.83	<.005	3.7	1.3	220	.30	130	6.1	<1	<1	<.05
MW-13	<.020	3.6	<.005	7.5	1.6	440	7.6	260	8.7	<1	<1	.49
MW-148	.029	1.4	<.005	5.3	4.2	550	.01	160	7.7	<1	<1	2.5
											<1	2.4
MW-14D	<.020	.75	<.005	3.8	22	470	.009	120	5.8	<1	<1	.06
						470	.009	120				
MW-158	<.020	1.6	<.005	14	.84	530	.07	240	23	<1	<1	.94
										<1		
MW-15D	<.020	1.4	<.005	17	1.6	360	.05	160	32	<1	<1	1.3
			<.005									
MW-16	<.020	1.0	<.005	28	.13	200	.34	120	56	<1	<1	1.3
											<1	
MW-178	<.020	3.6	<.005	16	.98	320	.01	90	46	<1	2.6	.16
	<.020	3.2		16	.98				46			.16
Duplicated MW-178 ⁵	<.020	3.4	<.005	18	.78	320	.01	90	34	2.2	2.8	.23
MW-17D	<.020	.87	<.005	3.0	.34	230	.01	81	45	<1	<1	.36
Blank 1 ⁶	<.020	.031	<.005	.46	<.005	46	*	*	<1	<1	<1	<.05
Blank 2 ⁶	<.020	.027	<.005	.066	.024	<20	*	*	<1	<1	<1	1.3
Blank 3 ⁶	<.020	.059	<.005	.28	.022	<20	*	*	<1	<1	<1	<.05
Blank 4 ⁶	<.020	.071	<.005	.24	.042	<20	*	*	<1	<1	<1	<.05

TABLE 9
STATISTICAL SUMMARY OF GROUNDWATER QUALITY
AT THE METAMORA LANDFILL
(AUGUST 1985)

Parameter .	Minimum	Maximum	Median
Spec. Cond. (umho/cm)	410	920	640
pH	6.2	8.8	6.9
Temp (°C)	10.9	15.3	13.9
Arsenic (ppm)	.005	0.14	.005
Cadmium (ppm)	.002	.002	.002
Calcium (ppm)	17	150	80
Chromium (ppm)	.005	.005	.005
Chromium, hex (ppm)	.005	.006	.005
Copper (ppm)	.005	.044	.008
Iron (ppm)	.022	6.7	0.16
Lead (ppm)	.020	0.063	.020
Magnesium (ppm)	5.3	70	33
Mercury (ppb)	1.0	1.0	1.0
Nickel (ppm)	.020	0.20	.020
Potassium (ppm)	0.72	41	1.0
Selenium (ppm)	.005	.005	.005
Sodium (ppm)	2.5	110	6.2
Zinc (ppm)	.005	22	.935
Alkalinity-CaCO ₃ (ppm)	200	1500	320
Carbonate (ppm)	0.009	7.6	.08
Bicarbonate (ppm)	81	640	150
Chloride (ppm)	3.4	200	15
Ammonia-N (ppm)	1	63	1
Total Kjeldahl Nitrogen (ppm)	1	78	1
Phosphorus-P (ppm)	.05	2.5	.06
Sulfate (ppm)	1.2	50	39
Oil & Grease (ppm)	5	72	5
Phenolics (ppb)	5	24	6.4
Total Org. Carbon (ppm)	9	200	26
Total Vol. and Semi-Vol. Organics (ppb)	ND	2615	10.2

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Table 8 (Continued)
SUMMARY OF ANALYTICAL SAMPLING

Units	Sulfate	Oil/ Grease ²	TOC	Phenolics ³	Methylene chloride	trichloroflu- oromethane	(1,1)Dichloro- ethane	(1,1,1)Trichlo- roethane	Toluene	Benzene	Ethyl benzene	trans-1,2- dichloroethane
	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
MW-1	38	<5	14	5.7								
			13									
MW-3	39	<5	18	<5								
MW-4	2.8	<5	200	13	7.3					23		61
				15								
MW-6(1,2,3,4) ⁴	40	51	56	8.1								
MW-6(2,3,4) ⁴	41	<5	14	8.1								
MW-6(3,4) ⁴	39	<5	53	<5								
MW-7(1,2,3) ⁴	40	<5	51	<5								
MW-8	45	<5	21	9.3		22		3.4				240
	43											
Duplicated MW-8 ⁵	42	<5	24	6.4		32	20					360
			25			32	19					360
MW-9	36	<5	62	9.8								
Duplicated MW-9 ⁵	37	<5	60	12								
MW-108	37	72	75	8.4								
MW-100	40	<5	28	9.0								
	38											
MW-11	50	<5	26	<5	3.3							
			24									
MW-12	39	<5	20	7.9								
MW-13	46	5.3	15	18								
MW-148	36	<5	46	<5	3.5	160	6.3	9.8				
MW-140	44	<5	26	<5		81						
MW-158	45	<5	82	<5	5.8	200	20	12				
MW-150	45	<5	21	<5	5.5	23						
MW-16	1.2	<5	64	<5								
			<5									
MW-178	4.1	<5	72	24	79		90		620	16	1400	
				22								
Duplicated MW-178 ⁵	4.0	<5	75	20			95		660	21	1500	
			72									
MW-170	43	<5	9	<5		11			4.6		29	
Blank 1 ⁶	1.5	<5	<5	<5								
Blank 2 ⁶	1.6	<5	<5	<5	1.7							
Blank 3 ⁶	1.6	<5	<5	<5								
Blank 4 ⁶	1.3	<5	<5	8.6								

Table 8 (Continued)
SUMMARY OF ANALYTICAL SAMPLING

Units	(1,2)Dichloroethane µg/l	Trichloroethene µg/l	Diethylphthalate µg/l	Diethylphthalate µg/l	Bis(2-Ethylhexyl) Phthalate µg/l	Di-n-butylphthalate µg/l
MW-1						
MW-3						
MW-4						
MW-6(1,2,3,4) ^a						
MW-6(2,3,4) ^a						
MW-6(3,4) ^a						
MW-7(1,2,3) ^a						
MW-8	29	7.9	9.6		240	
Duplicated MW-8 ^b	44 46	13 13	5.3		150	
MW-9						
Duplicated MW-9 ^b						
MW-10S						
MW-10D						
MW-11						
MW-12						38
MW-13						
MW-14S			8.4 9.3			
MW-14D						
MW-15S						
MW-15D					80	
MW-16						17
MW-17S				410		
Duplicated MW-17S ^b	28				12	
MW-17D						
Blank 1 ^c						
Blank 2 ^c						
Blank 3 ^c						
Blank 4 ^c	4					

¹Measurements

²Dissolved

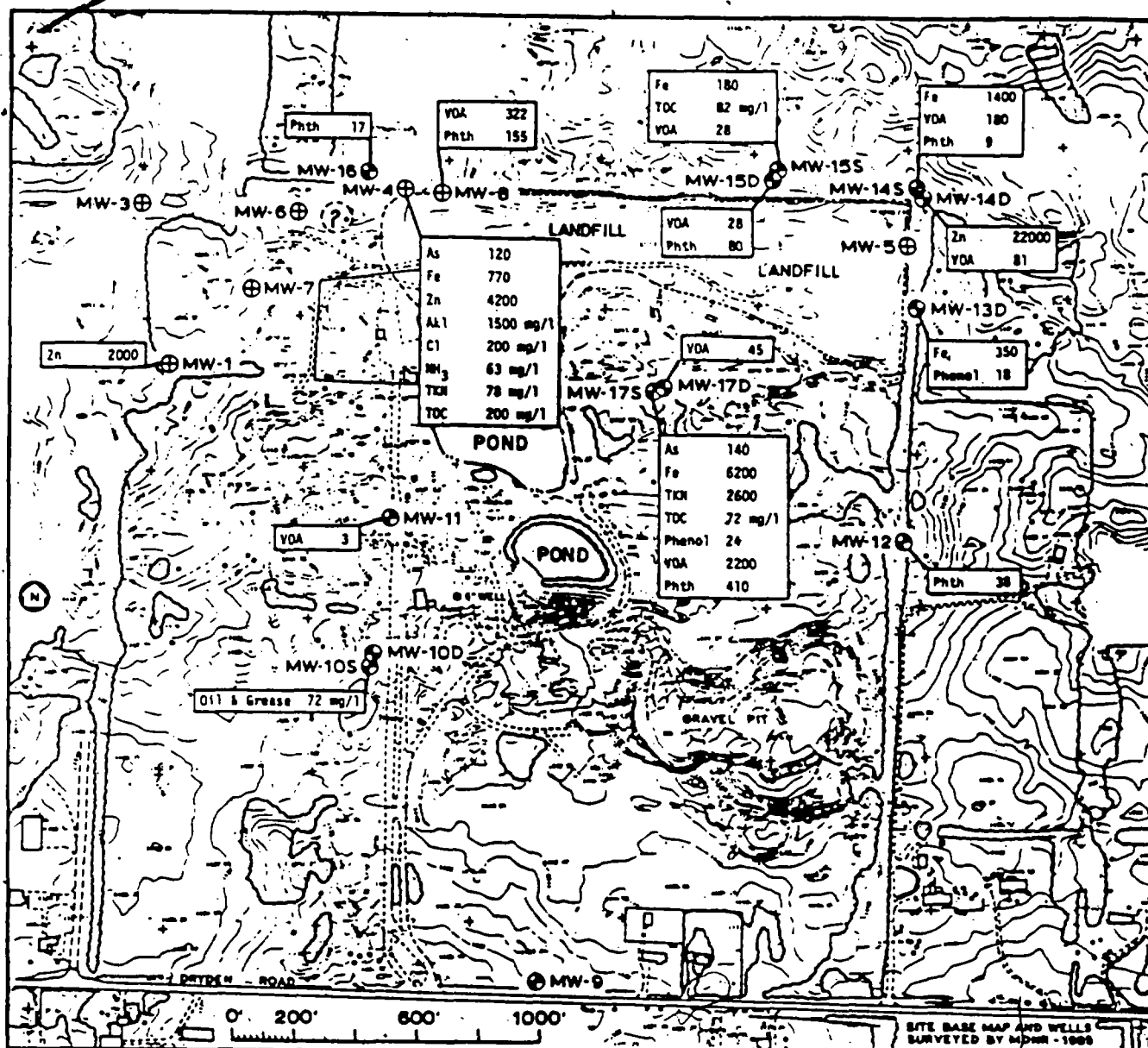
³Totals

⁴Multi-screen wells

⁵Blind duplicates

⁶Distilled H₂O field blanks

⁷No data available



LEGEND

As	Arsonic
Fe	Iron
Zn	Zinc
Alk	Alkalinity
Cl	Chloride
NH ₃	Ammonia, as N
TCH	Ejeldahl nitrogen, as N
TOC	Total Organic Carbon
VOA	Volatile Organic analytes
Phth	Phthalates
mg/l	micrograms per liter
mg/l	milligrams per liter

NOTE: Only elevated concentrations of contaminants of interest above background are presented. Concentrations are in micrograms per liter unless otherwise noted.

FIGURE 12 - SITE AREA

CONTAMINATION IN GROUNDWATER (SURFICIAL AQUIFERS)

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background concentrations in samples collected in the August groundwater sampling event.

Wells MW-1, MW-3, MW-6, MW-7, MW-9, MW-10 and MW-12, either upgradient of the refuse or far enough away from the wastes yet to be affected, exhibited similar characteristics of a groundwater that is apparently relatively free of significant contamination in the zone of sampling (see Table 8). Samples from each of these wells showed slightly elevated values of one or two relatively non-toxic chemicals or indicators, e.g. zinc or alkalinity. The sample from MW-12 did, however, contain some slight contamination by phthalates at 38 ppb. The groundwater samples taken from these wells provide an indication of the background groundwater quality in the vicinity of the site.

MW-4 presents an anomalous condition at the site. Based on the groundwater levels measured in this well, a perched water condition exists in the vicinity of MW-4. Hence, the groundwater samples taken from this well do not represent the water quality of the aquifer in this area, but rather are an indication of leachate quality from wastes in the immediate vicinity of MW-4 without benefit of dilution by the aquifer. The extent of the perched water in the vicinity of MW-4 is not known, but the perched condition is not apparent at either MW-8 or MW-16. The sample from MW-4 did contain 91 ppb of volatile organics (benzene, methylene chloride and trans-1,2-dichloroethene) and indications of contamination from municipal type wastes (high TOC and chloride).

The shallow well MW-17S, situated upgradient of the principal waste deposit, showed the greatest concentration of contaminants in any of the wells sampled.

The well pair MW-17S and MW-17D was installed in a topographical low area which was thought to receive contaminated run-off. This well is adjacent to a suspected drum disposal area. The analysis of the shallow-well groundwater sample showed about 2,000 ppb of aromatic volatile organic compounds (ethyl benzene, toluene and benzene) and lesser concentrations (200-300 ppb) of chlorinated hydrocarbons. The sample also contained elevated levels of phthalates from 17 to 410 ppb, and of arsenic (0.14 ppm) and iron (6.2 ppm). The sample from MW-17D showed 45 ppb of volatile organics, 34 ppb of this being ethyl benzene and toluene and the remainder, methylene chloride.

Organic priority pollutant chemicals were the principal contaminants of interest in the remaining wells. Single wells to the northwest of the principal refuse deposit showed contamination by volatile organics, principally chlorinated hydrocarbons, and also by phthalates. MW-16 contained no volatile organics but 80 ppb of phthalates. MW-8 contained 380 ppb of volatile organics and 200 ppb of phthalates. No well log was available for MW-8 and the screen interval at which the sample was taken is not known. Wells sampled to the northeast of the refuse area included the two well pairs, MW-14 and MW-15. As in the other well pairs with detectable organic contamination, the shallow sample was considerably more contaminated than the deeper one. MW-15S contained 238 ppb of volatile organic contaminants while MW-15D contained 28 ppb. The volatile species were principally chlorinated hydrocarbons; phthalates were not detected in MW-15S but were present at 80 ppb in MW-15D. MW-14S contained 180 ppb volatiles and 9 ppb phthalates while the deeper sample (MW-14D) contained only 81 ppb of volatile organics and no phthalates.

In general, the priority pollutant organic contamination was not high in the few wells downgradient from the principal refuse location. However, groundwater flow in the area of the refuse as determined from an interpretation of the groundwater level data may be more directly north through an area where currently there are no wells. Also, the current estimates of hydraulic conductivities for the soil units encountered allow for the possibility of sufficiently slow migration such that the maximum concentrations of contaminants present in the aquifer might not have reached the present wells. Better definition of the contaminant plume during the planned remedial investigation may also permit more accurate estimates of the rates of groundwater flow and contaminant transport and fate of the plume. Note also that the major contaminants found in MW-17S were aromatic volatile organics which are typically environmentally less persistent than many of the chlorinated solvents.

During the field activities soil samples were screened in order to provide indications of volatile organic contaminants with depth and to aid in the positioning of well screens. This technique did not always show strong correlations between soil and groundwater results, largely due to the low levels of volatile organics that were encountered. However, it did appear to correlate at the contaminant levels encountered in MW-17S and, in general, serves as a useful technique to aid in well screen placement given the lack, or in support, of any other definitive information.

6.0 RECOMMENDATIONS

o Clay Till Layer

There is a need to determine the continuity and attitude of the clay till layer that appears to underlie the ice contact, sand, and gravel deposits. This could be accomplished through a combination of deep borings with samples to or into bedrock, and possibly geophysics.

o Bedrock Aquifer

There is a need to determine the interconnection, if any, between the surficial and bedrock aquifers. Flow patterns in the bedrock aquifer must also be defined. Jordan recommends installing a minimum of four monitoring wells in the bedrock to be used for both piezometric measurements and water quality data.

o Permeability

Jordan recommends performing a pump test in the surficial aquifer to estimate the overall permeability of the surficial aquifer. In situ permeability testing in selected bedrock and surficial wells is also recommended.

o Analytical Program

In order to develop an historical data base of groundwater quality data which will allow meaningful comparisons to be made over time and space, it is essential to follow consistent sampling and analytical protocol. It is equally important that procedures for sample collection, handling, and analysis be well documented. Therefore, it is suggested that future water quality analyses include determination of dissolved (as opposed to total) metals and that filtration and preservation of these samples occur in the field immediately after sample collection. Furthermore, it would be useful to add a determination of total dissolved solids (TDS), COD and hardness (as CaCO_3) to the list of parameters as these are generally accepted indicators of inorganic contamination.

o Domestic Well Data

All results from the previous chemical analysis of samples from water wells in the vicinity of the Metamora site should be obtained from the Lapeer County and Michigan Public Health Departments and assembled as the basis of an historical data base. This should include domestic wells, commercial wells (i.e., the well serving the gravel company), and the Metamora municipal wells.

o Future Well Locations

Well locations for future work should be selected to account for the northerly direction of groundwater flow in the vicinity of the primary waste deposits. The concentrations of lighter than water aromatics in well MW-17S suggest that it may be necessary to consider the possibility That aromatics move in shallow levels in the aquifer and that chlorinated compounds move in deeper levels in the aquifer. The presence of drums, resulting in delayed and sporadic contaminant release, may also complicate interpretation of groundwater quality data.

**METAMORA LANDFILL SITE
METAMORA TOWNSHIP, MICHIGAN**

**SITE INVESTIGATION
FINAL REPORT
APPENDIX**

**PREPARED FOR
MICHIGAN DEPARTMENT OF
NATURAL RESOURCES**

FEBRUARY 1986

EC. JORDAN CO.

APPENDIX

METAMORA SITE CHARACTERIZATION

METAMORA, MICHIGAN

Prepared For

Michigan Department of Natural Resources

E.C. JORDAN CO.

FEBRUARY 1986

LIST OF APPENDICES

APPENDIX	TITLE
A	BORING LOGS
B	COMPOSITE BORING LOGS
C	DOMESTIC WELL LOGS
D	ANALYTICAL LABORATORY DATA

APPENDIX A

BORING LOGS

FIELD LOG SOIL				Boring No. MW-9	
Project NO 4465.91		Project Name Matamora Site Investigation		Page 1 of 2	
Contractor J. Matheas & Ass.		Driller C. Faus		Date started 3/27/85 completed 3/29/85	
Method BSA		Casing Size 4.25"		HNH 11.7/10.2	
Ground EL 1129.4		Soil Drilled 133.5'		-2' below ground	
Total Depth 133.5'					
Logged by J. Pickett		Checked by		Date	

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNH jar	Comments on Advance of Boring	Monitoring	
							HNH	LEL
S-1	8.5-10.0'	6-12-16	feet 1.5 1.5	Lt. brown fine to med. sand w/ trace of fine gravel; loose; med. dense; uniformly graded	ppm 0.5	10-20': a few cobbles	ppm 2.5	NA
S-2	18.5-20.0	13-15-20	1.5 1.0	Lt. brown fine to coarse sand w/ some fine to coarse gravel; med. dense; dry; uniformly graded	0.5		2.5	
S-3	28.5-30.0	15-30-38	1.5 1.5	Lt. brown fine sand; med. dense dry; uniform fine sand; similar to S-2	0.5	no cobbles encountered	2.5	
S-4	38.5-40.0	3-18-23	1.5 1.5	Lt. brown fine to med. sand w/ trace of fine gravel; med. dense to dense; dry; uniformly graded	0.5		2.5	
S-5	48.5-50.0	3-28-33	1.5 1.0	Lt. brown fine to med. sand w/ trace fine gravel; med. dense to dense; dry; uniformly graded	0.5		1.5	
S-6	58.5-60.0	3-18-83	1.5 1.5	Lt. brown to brown fine sand w/ trace of silt and fine gravel; dense to med. dense; moist; uniformly graded	0.5	encountered coarse gravel @ 50-57'	1.5	
S-7	68.5-69.5	9-100/0.5	1.0 0.8	Lt. brown coarse sand and gravel; uniformly graded; gravel is angular	0.5	cobbles: 57-67'	0.5	
S-8	78.5-80.0'	2-10-22	1.5 1.0	Gray brown sandy silt to silty sand w/ trace of gravel; med. dense to dense; dry; slightly plastic fines and trace of clay (Till)	0.5	change @ 76'	0.5	

FIELD LOG SOIL		Boring No. MW-9
Project No 4465.91	Project Name Matamoros Site Investigation	Page 2 of 2

Sample No	Depth in Feet	Blows per 6 inches	Pen Test	Description	HNU jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
S-9	88.5-90.0	10-20-23	1.5 1.5	Lt. brown med. to coarse sand w/ some gravel; dense; dry; uniformly graded	1.0	Till appears to be from 76-88'	0.5	
S-10	98.5-100.0	2-20-73	1.5 1.0	Lt. brown med to coarse sand w/ some fine gravel; dense; dry; uniformly graded	1.0		0.5	
S-11	108.5 - 109.1	57-100/0.1	0.6 0.6	Lt. brown to lt. gray med to coarse sand w/ some fine gravel; dense; dry; uniformly graded; similar to S-10	1.0		1.0	
S-12	118.5 - 119.1	53-100/0.1	0.6 0.6	Lt. brown to lt. gray med. to coarse sand w/ some fine gravel; dense; dry; uniformly graded; slightly coarser than S-11	1.0	drillers add 10 gals. of water before continuing to 130'	1.0	
S-13	128.5 - 130.0	9-10-115	1.5 1.5	Lt. brown med. to coarse sand w/ some fine gravel; dense; wet; uniformly graded	1.0		1.0	
				Measured bottom of boring: 133.5'				
				Static water level below ground: 123.2'				

FIELD LOG SOIL				Boring No. MW-10S	
Project No 4463.91		Project Name Metamora Site Investigation		Page 1 of 2	
Contractor J. Matthes & Ass.		Driller C. Fees		Date started 4-1-85 completed 4-1-85	
Method SSA		Casing Size 4.25" I.D.		HNW 11.7/10.2	
Ground EL 1116.9		Soil Drilled 123.5		Protection Level D	
		↓ below ground		Total Depth 123.5'	
Logged by H. O'Hearn		Checked by		Date	

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNW jar pps	Comments on Advance of Boring	Monitoring	
							HNW	LEL
S-1	8.5-10.0	1-5-9	<u>1.5</u> 1.3	Brown silty sand to sandy silt w/ gravel; dense; moist; al. iron-staining; Till-like in appearance	1.0		1.0	
S-2	18.5-20.0	8-18-15	<u>1.5</u> 1.3	Rusty brown fine to coarse sand w/ gravel and trace of silt; loose; moist	1.1		-	
S-3	28.5-30.0	4-23-25	<u>1.5</u> 1.3	Lt. brown fine to med. sand; mod. dense; wet; uniformly graded	0.7		-	
S-4	38.5-40.0	15-100-refusal	<u>1.5</u> 1.0	Brown med. to coarse sand and gravel/ trace of silt; moist	0.8		-	
S-5	48.5-50.0	10-21-33	<u>1.5</u> 1.0	Lt. brown fine to coarse sand and gravel; subangular gravel; loose; dry; fossiliferous cobble fragments	0.8		-	
S-6	58.5-60.0	10-20-23	<u>1.5</u> 1.1	Lt. brown med. to coarse sand and gravel; loose; dry	0.5		0.5	
S-7	68.5-70.0	3-100-refusal	<u>1.5</u> 0.5	similar to S-6	0.5		-	
S-8	78.5-80.0	15-100-	<u>1.5?</u> 0.5	Rusty brown fine to med. sand w/ cobble fragments; loose; moist; iron-staining	-		-	
S-9	88.5-90.0	10-25-36	1.5 0.5	Brown med. to coarse sand and gravel; loose; dry; iron-staining	0.5		1.0	
EC JORDAN CO.					Boring No MW-10S	Page 1 of 2		

FIELD LOG SOIL		Boring No MW-10S
Project No 4465.91	Project Name Matamorita Site Investigation	Page 2 of 2

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNU Jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
			feet		ppm		ppm	
S-10	98.5-100.0	15-23-36	$\frac{1.5}{0.7}$	Lt. brown fine sand; loose; moist	0.7		—	
S-11	108.5-110.0	0-25-43	$\frac{1.5}{0.6}$	Lt. brown fine to coarse sand w/ trace of gravel; loose; dry	0.6		—	
S-12	118.5-120.0	7-17-30	$\frac{1.5}{1.5}$	Lt. brown fine to coarse sand w/ trace of gravel; loose; wet	—		—	
				Bottom of Boring: 123.5' Static water level: 112'				

FIELD LOG SOIL			Boring No. MW-100	
Project No 4465.91	Project Name Metmore Site Investigation		Page 1 of 1	
Contractor J. Mathes & Ass.	Driller T. Marle	Date started 7/25/85	completed 7/30/85	
Method Wash & Drive	Casing Size 4"	HNU 11.7/10.2	Protection Level p	
Ground El 1116.2	Soil Drilled 87.7'	2' below ground	Total Depth 187.7'	
Logged by Petersen/White	Checked by	Date		

Note: Mud rotary pilot hole drilled from 0-100' without samples; see log for MW-108 for soil conditions from 0-100'; MW-100 was drilled from the bottom of the pilot hole to a depth of 187.7'

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNU jar ppm	Comments on Advance of Boring	Monitoring	
							HNU ppm	LEL
S-1	110.0 -- 111.0	150-190	1.0 0.8	Brown silty fine to med. sand w/ minor coarse sand and trace of gravel; very dense; wet; poorly graded	0.3		0.3	0
S-2	120.0 - 120.5	400/0.5'	0.5 0.3	0.2' wash 0.1 poor recovery, but appears to be similar to S-1	0.3		0.3	0
S-3	130.0 - 130.8	185-300/0.3	0.8 0.6	Lt. brown fine to med. sand w/ trace of coarse sand and gravel; very dense; wet	0.3		0.3	0
S-4	140.0 - 140.7	215-200/0.2	0.7 0.4	Lt. brown gravelly med. to coarse sand; clean; uniform; wet	0.5		0.0	0
S-5	150.0 - 151.0	100-152	1.0 0.0	no recovery; gravel wash	0.5		0.5	0
S-6	160.0 - 161.5	81-115-185	1.2 0.0	no recovery; silty sand wash coating spoon	—		0.0	0
S-7	163.5 - 165.0	35-212-125	1.5 1.2	Lt. brown silty fine sand to very fine sand; dense; uniform wet; slight iron-staining	0.5		0.0	0
S-8	170.0 - 170.9	86-204/0.4	0.9 0.0	no recovery	—		0.0	0
rotary drilled from 170-187.7' - cuttings consisted of fine sand without any coarse sand or gravel Bottom of Boring: 187.7'								
EC JORDAN CO					Boring No MW-100		Page 1 of 1	

FIELD LOG SOIL				Boring No. MW-11 PILOT	
Project No. 4465.91	Project Name Metamora Site Investigation			Page 1 of 1	
Contractor J. Mathes & Ass	Driller E. Youst	Date started 7/13/85		completed 7/16/85	
Method Mud Rotary	Casing Size 6"	HNU 11.7/10.2	Protection Level 0		
Ground El. 1111.4	Soil Drilled 100'	↓ below ground		Total Depth 100'	
Logged by M. Eames	Checked by	Date			

Sample No	Depth in Feet	Blows per 6 inches	Pen N/C	Description	HNU jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
			feet		ppm		ppm	
S-1	10.0-11.5	5-7-6	1.5 1.2	Lt. brown silty sand w/ trace of gravel; loose; moist	1.0		0.0	—
S-2	20.0-21.5	17-19-23	1.5 0.3	Lt. brown gravelly silty sand loose to med. dense; moist	1.0 0		—	—
S-3	30.0-31.5'	17-26-32	1.5 0.7	Lt. brown gravelly med. to coarse sand; dense; wet	1.0		—	—
S-4	40.0-41.5	6/1.0-76/5	1.5 0.3	Similar to S-3	1.0		—	—
S-5	50.0-51.5	6-26-46	1.5 0.5	Brown fine to med. sand w/ trace of gravel; dense	1.0		—	—
S-6	60.0-61.5	22-33-47	1.5 1.0	Brown med. to coarse sand w/ gravel; dense; moist	1.0		—	—
S-7	70.0-71.4	25-46-50/0.4	1.4 0.3	Brown fine to med. sand; dense; moist	1.0		—	—
S-8	80.0-81.0	17-80	1.0 1.0	80-80.7: brown-gray silty clay firm; slightly plastic; no gravel 80.7-81: gray gravelly silty sand w/ trace of clay; dense; moist. (Till)	1.0		0.0	—
S-9	90.0-91.5	28-48-60	1.5 1.0	Brown gravelly fine to coarse sand; dense (Till ?)	0.0		—	—
S-10	100.0 - 101.5	— — —	1.5 0.9	Brown gravelly silty sand w/ trace of clay; dense; dry bottom 0.2' of spoon: brown fine sand; moist (Till)	0.0		—	—
E.C. JORDAN CO.					Boring No. MW-11 pilot	Page 1 of 1		

FIELD LOG SOIL				Boring No. MW-11	
Project No 4463.91		Project Name Metamora Site Investigation		Page <u>1</u> of <u>1</u>	
Contractor J. Mathes & Ass.		Driller J. Signall		Date started 7/24/85 completed 7/29/85	
Method Wash & Drive		Casing Size 4"		HNJ 11.7/10.2 Protection Level 0	
Ground El 1111.4		Soil Drilled 39.5		Total Depth 139.5	
Logged by C. White		Checked by		Date	

Note: See log for MW-11 pilot for soil conditions from 0-100'
 MW-11 was drilled from bottom of pilot hole (100') to a depth of 139.5'

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNJ jar	Comments on Advance of Boring	Monitoring	
							HNJ	LEL
			feet		ppm		ppm	% LEL
S-11	110.0 - 11.5	24-52-75	1.5 1.2	Gray gravelly sandy silt; very dense; moist; widely graded (Till)	0.5		0.5	0
S-12	120.0 - 121.5	28-44-56	1.5 1.5	Similar to S-11	0.5		0.5	0
S-13	130.0 - 131.5	— — —	1.5 0.3	poor recovery - gray sandy silt w/ cobble fragments	0.5	change to sand @ 132'	0.5	0
S-14	134.0 - 136.0	14/1.0 - 30-70	2.0 2.0	Lt. brown fine sand; uniform loose; wet	0.5	134-139': med to co. sand in wash; appears to be primarily sand w/ some gravel; no fines	0.5	0
				Bottom of Boring: 139.5'				

FIELD LOG SOIL				Boring No. MW-12 PILOT	
Project No 4465.91	Project Name Matamora Site Investigation			Page 1 of 2	
Contractor J. Mathas & Ass	Driller T. Mario		Date started 5/19/85	completed 5/20/85	
Method Mod Rotary	Casing Size 5" PVC	HNU 11.7/10.2	Protection Level B		
Ground EL 1111.5	Soil Drilled 98.0	± below ground	Total Depth 98.0		
Logged by C. White		Checked by	Date		

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec Feet	Description	HNU jar ppm	Comments on Advance of Boring	Monitoring	
							HNU ppm	LEL % LEL
S-1	8.0-9.5	7-5-7	1.5 1.2	Mottled brown to rusty brown clayey silt w/ fine sand layer sl. plastic; moist; med. dense	0.5		0.5	0
S-2	18.5-19.5	15-22-26	1.5 1.3	Lt. brown silty fine sand w/ trace of gravel; gravel is sub angular; dense; moist; Till-like	0.5		0.5	0
S-3	28.0-29.5	15-26-26	1.5 1.0	Lt. brown silty fine to coarse sand w/ gravel; med. dense; iron-staining	0.5		0.5	0
S-4	38.0-39.5	38-40-40	1.5 1.5	Lt. brown slightly silty fine to coarse sand w/ gravel; dense; moist; widely graded	0.5		0.5	0
S-5	47.8-49.3	17-17-20	1.5 1.2	Gray sl. silty fine to coarse sand w/ trace of gravel; med. dense; moist; gravel predom. subangular; color change to gray at top of spoon	0.5	55-57': hard drilling cobbles	0.5	0
S-6	58.0-59.5	30-49-66	1.0 1.0	Lt. brown fine to med. sand w/ trace of silt; loose; moist; bottom 0.4' of spoon: silty fine sand, thinly laminated med. dense	0.5		0.5	0
S-7	68.0-69.5	35-76-105	1.5 1.0	Lt. fine to med. sand w/ trace silt; loose to running; very wet; no co. sand or gravel	0.5		0.5	0
S-8	77.8-79.3	46-66-100	1.5 1.2	Lt. brown fine sand; uniform med. dense; moist; no gravel	0.5	soils becoming finer with depth	0.5	0

FIELD LOG SOIL

Boring No. MW-12
PILOT

Project No 4465.91	Project Name Matamora Site Investigation
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Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNU jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
S-9	88.0-89.5	50-90-100	1.5 1.5	Brown fine to med. sand w/ trace of coarse sand and gravel; med. dense; moist; similar to S-8 though slightly coarser	0.5		0.5	0
S-10	98.0-98.9	125-103/0.3	0.9 0.6	Brown med. to coarse sand w/ trace of gravel; loose; moist predom. coarse sand Bottom of pilot hole: 98.0'	0.5		0.5	0

FIELD LOG SOIL				Boring No. MW-12	
Project No 4465.91		Project Name Metamora Site Investigation		Page 1 of 1	
Contractor J. Mathes & Ass.		Driller C. Roberts		Date started 6/18/85 completed 6/19/85	
Method Casing advan.		Casing Size 3"		HNH 11.7/10.2 Protection Level	
Ground El 1111.5		Soil Drilled 30		2' below ground Total Depth 128.0	
Logged by C.White		Checked by		Date	

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNH jar ppm	Comments on Advance of Boring	Monitoring	
							HNH ppm	LEL
S-11	107.5 - 109.0	55-90-72	1.5 1.2	Brown fine sand, thinly laminated w/ silt layers; med. dense; wet	1.0		1.0	0
S-12	118.0 - 119.5	35-60-67	1.5 1.0	Brown slightly silty fine sand; med. dense; wet	1.0		1.0	0
S-13	128.0 - 129.5	59-80-130	1.5 1.2	Lt. brown fine sand; thinly laminated w/ silt layers; wet; sl. odor (?)	1.0		1.0	0
				Measured bottom of boring: 126.9'				
				Static water level: 107.2'				

FIELD LOG SOIL				Boring No. MW-13S	
Project No 4465.91		Project Name Metamora Site Investigation		Page <u>1</u> of <u>2</u>	
Contractor J. Mathee & Ass.		Driller T. Marlo		Date started 4/13/85 completed 4/13/85	
Method HSA		Casing Size		HNU 11.7/10.2	
Ground El. MA		SOM Drilled 143.5		Protection Level B	
		Z below ground		Total Depth 143.5	
Logged by E. Wiley		Checked by		Date	

Note: MW-13 was drilled with hollow stem augers - augers could not be removed from ground so hole was abandoned

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNU Jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
			feet		ppm		ppm	MA
S-1	7.0-8.5	5-5-3	1.5 0.2	Brown gravelly silty sand w/ trace of clay; loose; moist	0.2		0.1	
S-2	17.0-18.5	4-4-6	1.5 1.2	Lt. brown med. to coarse sand w/ trace gravel; loose to med. dense; moist	0.3	13-17': co. sand and gravel in cuttings	0.1	
S-3	27.0-28.5	8-10-16	1.5 1.0	Lt. brown med. to coarse sand w/ gravel layers; clean; med. dense; dry	0.3	19.5-27': cobbles, sl. methane odor	0.1	
S-4	37.0-38.5	6-10-20	1.5 1.0	Lt. brown gravelly med. to coarse sand; med. dense	0.4		0.1	
S-5	47.0-48.5	20-29-46	1.5 1.0	Lt. brown fine to med. sand w/ trace of silt; dense; dry	0.2	37-45': "gravel"	0.1	
S-6	57.0-57.4	105/0.4'	0.4 0.4	Brown silty gravelly sand to sandy gravel; very dense	0.3	54-56': "gravel"	0.2 - 0.4	100% @ 57'
S-7	67.0-67.8	15-104/0.3	0.8 0.8	Brown silty fine to coarse sand and gravel; very dense; moist	0.4	62-67': cobbles using bentonite to control methane	0.3	100% @ 67'
S-8	77.0-78.5	42-45-47	1.5 1.0	Brown med. to coarse sand and gravel w/ trace of silt; dense to very dense	0.3	67-77': cobbles	0.2	6% w/ group
S-9	87.0-88.5	WOR-19-23	1.5 1.0	Brown fine to med. sand; med. dense; moist	0.2	77-82: gravel & cobble 82-87: sand	0.2	1%
S-10	98.5-100.0	WOR-32-48	1.5 1.2	Brown gravelly silty sand; dense; moist	0.6	92-97': loose silty sand	0.1	0%
EC. JORDAN CO.					Boring No MW-13 S	Page <u>1</u> of <u>2</u>		

FIELD LOG SOIL		Boring No. MW-13S
Project No 4465.91	Project Name Metamora Site Investigation	Page 2 of 2

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNU jar ppm	Comments on Advance of Boring	Monitoring	
							HNU ppm	LEL
S-11	108.5 - 110.3	32-104/0.4	0.8 0.8	Lt. brown silty fine sand; very dense; dry	2.1		0.3	0
S-12	118.5 - 119.5	32-106	1.0 1.0	Brown silty fine sand w/ clay silt layer 1" wide; very dense; moist	1.5	108-118: smooth drilling, drillers suspect water	0.3	0
S-13	128.5 - 129.4	37-100/0.4	0.9 0.9	Brown fine sand w/ dark brown silt layers; thinly laminated very dense; moist	0.5	smooth drilling	0.3	6%
S-14	138.5 - 140.0	W02-53-70	1.5 1.5	Brown silty fine sand w/ trace of clay; dense; wet Augers stuck in the ground at 143.5' - boring is abandoned.	0.2	smooth drilling	0.3	3%

FIELD LOG SOIL				Boring No. MW-13D	
Project No 4465.91		Project Name Matamora Site Investigation		Page 1 of 1	
Contractor J. Mathes & Ass.		Driller T. Marlo		Date started 5-9-85 completed 5-10-85	
Method Mud Rotary		Casing Size 4 1/2		HNH 11.7/10.2 Protection Level p	
Ground El 1138.2		Soll Drilled 178'		2' below ground Total Depth 178'	
Logged by J. Pickett		Checked by		Date	

Note: Mud-rotary hole drilled from 0-178'; no split spoon samples from 0-148'.

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNH jar	Comments on Advance of Boring	Monitoring	
							HNH	LEL
S-1	148.0 - 149.5	37-56-80	1.5 1.0	Gray silty fine sand; very dense; wet; non-plastic fines	0.5		0.5	0
S-2	158.0 - 159.5	40-70-105	1.5 1.5	Gray silty fine sand w/ silty clay layers; dense; wet	0.5		0.5	0
S-3	168.0 - 169.5	22-41-58	1.5 1.5	Gray silty clay; stiff; moist slightly plastic; few gravel	0.5		0.5	0
S-4	178.0 - 179.5	37-70-70	1.5 1.5	Gray sandy silt to silty sand w/ trace of clay and some gravel; dense; moist (Till)	0.5		0.5	0
				Bottom of the Boring: 178'				

FIELD LOG SOIL				Boring No. MW14S PILOT	
Project No 4445.91		Project Name Metamora Site Investigation		Page 1 of 2	
Contractor J. Mathes & Ass.		Driller T. Marlo		Date started 5/21/85 completed 6/25/85	
Method Mud Rotary		Casing Size 6"		HNW 11.7/10.2 Protection Level 3 ^D	
Ground El 1142.7'		Soll Drilled 130.3'		Total Depth 130.3'	
Logged by C. White		Checked by		Date	

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNW jar ppm	Comments on Advance of Boring	Monitoring	
							HNW ppm	LEL % LEL
S-1	8.0-9.5	4-4-5	1.5 0.8	Brown to reddish brown slightly silty med. to coarse sand w/ trace of gravel; loose; dry; iron-staining	1.0		1.0	0
S-2	18.0-19.5	7-11-12	1.5 1.5	Lt. brown fine sand; clean; uniform; loose; dry	1.0		—	—
S-3	28.0-29.5	11-15-17	1.5 1.3	Lt. brown fine sand dense; moist; similar to S-2	1.0		1.0	0
S-4	38.0-39.5	17-22-28	1.5 1.2	Brown fine to med. sand w/ trace of coarse sand; loose; moist	1.0	34-35': "gravel"	1.0	0
S-5	48.0-49.5	25-24-23	1.5 1.4	Brown fine to coarse sand w/ gravel; trace of silt (med?) loose; wet	0.5		1.0	—
S-6	58.0-59.5	15-30-20	1.5 0.0	no recovery; cobble stuck in the top of spoon	0.5	50-60': very coarse	1.0	0
S-7	70.0-71.5	13-15-12	1.5 0.8	Lt. brown fine to med. sand w/ trace of coarse sand; loose wet; similar to S-4	0.5		1.0	0
S-8	80.0-81.5	15-32-30	1.5 0.8	Lt. brown med. to coarse sand w/ gravel and cobble fragments gravel angular to subangular; loose; wet	0.5	appear to be getting out of cobble zone	1.0	0
S-9	90.0-91.5	21-23-35	1.5 1.3	Lt. brown fine to med. sand w/ gravel and trace of coarse sand; loose; wet	1.3		1.0	—

FIELD LOG SOIL		Boring No. MW-14S PILOT
Project No 4465.91	Project Name Metamora Site Investigation	Page 2 of 2

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNU jar ppm	Comments on Advance of Boring	Monitoring	
							HNU ppm	LEL
S-10	100.0 - 101.5	35-45-62	1.5 1.2	Brown fine sand; med. dense; moist	1.0		0.3	0
S-11	110.0 - 110.8	76-100/0.3	0.8 0.3	Fine to coarse sand and gravel and cobble fragments; partially cemented; wet	0.5	change @ 104' to coarser material	0.4	0
S-12	120.0 - 121.5	60-72-84	1.5 1.5	Brown fine sand; med. dense; moist; similar to S-10	0.8	change @ 115' to finer material	0.6	0
S-13	130.0 - 130.3	~100/0.3	0.3 0.3	poor recovery; Brown fine to med. sand; dense; moist	0.6		0.5	—
				Bottom of the pilot hole: 130.0				

EC. JORDAN CO.
Boring No MW-14S
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FIELD LOG SOIL				Boring No MW-14S	
Project No 4465.91	Project Name Matamora Site Investigation			Page 1 of 1	
Contractor J. Mathes & Ass.	Driller T. Harlo	Date started 7/9/85		completed	
Method Wash & Drive	Casing Size 4"	HNU 11.7/10.2	Protection Level D		
Ground El 1142.7	Soil Drilled 39'	2' below ground	Total Depth 149'		
Logged by C. White		Checked by	Date		

Note: See log for MW-14S pilot for soil conditions from 0-130'. MW-14S was drilled from the bottom of the pilot hole (130') to a depth of 169'

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNU jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
			feet		ppm		ppm	± LEL
S-14	138.0 - 139.0	60-150/0.5	1.0 0.8	Brown med. to coarse sand; angular; loose; wet	2.0		2.0	0
S-15	148.0 - 194.5	100-100-103	1.5 1.0	Lt. brown fine to med. sand w/ trace of silt, and coarse sand; subangular; med. dense; wet	0.4		0.2	0
S-16	158.0 - 159.5	60-80-150	1.5 0.9	Lt. brown fine to med. sand; laminated w/ 1/4" to 1/2" silt layers; lower 0.4' of spoon grades to gray silty clay w/ fine sand layers; very stiff; moist; sl. plastic	0.2		0.2	0
S-17	159.0 - 161.0	100-100-100	2.0 1.6	Gray silty clay to clayey silt; thinly laminated w/ silt layers	2.0		2.0	0
S-18	159.5 - 160.5	133-290	1.0 1.0	Re-sampled same zone - gray fine sand; very dense; moist; slight odor ?	2.0		2.0	0
S-19	167.7 - 169.0	73-82-137/0.3'	1.3 1.0	Gray gravelly sandy silt; very dense; moist; (Till)	2.0		2.0	0
				Bottom of boring: 169' A				

FIELD LOG SOIL				Boring No. MW-14D	
Project No 4465.91		Project Name Matamora Site Investigation		Page 1 of 1	
Contractor J. Mathas & Ass.		Driller T. Marlo		Date started 7/14/83 completed 7/16/83	
Method Wash & Drive		Casing Size 4"		HNW 11.7/10.2 Protection Level D	
Ground EL 1144.7		Soil Drilled 30		Total Depth 160'	
Logged by C. White		Checked by		Date	

Note: Had rotary pilot hole drilled from 0-130' without samples. See log for adjacent boring MW-14S for soil conditions from 0-130'. MW-14D was drilled from the bottom of the pilot hole (130') to a depth of 160'.

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNW jar	Comments on Advance of Boring	Monitoring	
							HNW	LEL
S-1	140.0 - 140.5	300/0.5'	0.5	no recovery - gravel in the bottom of the spoon	0.5		0.5	0
S-2	156.0 - 156.7	200-100/0.2	0.7	no recovery	0.5	coarse sand and gravel in cuttings	0.5	0
S-3	160.0 - 161.0	50-200	1.0 0.6	Dark gray clay-silt; slightly plastic; mod. stiff; wet	0.5		0.5	0
				Bottom of the boring: 160'				

FIELD LOG SOIL				Boring No. MW-15S PILOT	
Project No. 4465.91		Project Name Matamora Site Investigation		Page 1 of 2	
Contractor J. Mathas & Ass.		Driller K. Young		Date started 7-23-85 completed 7-24-85	
Method Mod Rotary		Casing Size 6"		HNJ 11.7/10.2	
Ground El 1123.1		Soil Drilled 110'		Protection Level B	
Logged by J. Peterson		Checked by		Date	

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNJ jar ppm	Comments on Advance of Boring	Monitoring	
							HNJ ppm	LEL %
S-1	10.0-11.5	10-12-17	1.5 0.9	10.0-10.3: Lt. brown sandy silt; moist 10.3-11.3: Brown silty gravelly sand; med. dense; wet	0		0	0
S-2	20.0-21.5	10-13-19	1.5 1.2	Lt. brown fine to med. sand w/ trace of gravel; med. dense to dense; wet	0		0	0
S-3	30.0-31.5	16-13-15	1.5 1.4	Lt. brown fine to coarse sand fine sand is laminated; med. dense; moist	0		0	0
S-4	40.0-41.5	19-32-35	1.5 0.9	Lt. brown sandy gravel; fine to coarse sand; med. dense; moist	0		0	0
S-5	50.0-51.5	12-16-26	1.5 1.4	Lt. brown gravelly sand; fine to med. sand; gravel lenses 1"-2"; med. dense; moist	0		0	0
S-6	60.0-61.5	15-20-25	1.5 0.6	Lt. brown sandy gravel; fine to med. sand; dense; moist	0		0	0
S-7	70.0-71.5	15-18-19	1.5 0.6	Lt. brown fine to med. sand w/ trace of gravel; dense; wet	0		0	0
S-8	80.0-81.5	15-17-21	1.5 0.6	Lt. brown gravelly fine to coarse sand; med. dense; wet	0.3		0	0
S-9	90.0-91.5	16-34-35	1.5 0.9	Lt. brown gravelly med. to coarse sand w/ trace of fine sand and silt; dense; wet	0.3		0	0
S-10	100.0 - 101.5	15-21-22	1.5 0.5	Lt. brown gravelly fine to med. sand w/ trace of silt; dense; wet	0.3		0	0

FIELD LOG SOIL		Boring No. MW-15S PILOT
Project No 4465.91	Project Name Matamoros Site Investigation	Page 2 of 2

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNU jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
			feet		ppm		ppm	% LEL
S-11	110.0 - 110.9	36-75/0.4	0.9 0.1	poor recovery - primarily wash Bottom of the pilot hole: 110'	0.3		0	0

Boring No. MW-15S

Note: See log for MM-158 pilot for soil conditions from 0-110'. MM-158 was drilled from the bottom of the pilot hole to a depth of 124'.

Sample No	Depth in Feet	Blows per 6 inches	Pen REC	Description	HNU jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
S-12	121.0 - 122.0	82-130.	feet <u>1.0</u> 0.2	Lt. brown fine to med. sand w/ trace of silt; dense; wet	ppm 0.3		ppm 0.2	% LEL 0
Bottom of Boring: 124.0'								

EC JORDAN CO
Boring No MS-158
Page 1 of 1

FIELD LOG SOIL				Boring No. MW-15D	
Project No 4463.91		Project Name Metamora Site Investigation		Page <u>1</u> of <u>1</u>	
Contractor J. Mathes & Ass.		Driller T. Harlo		Date started 8-3-85 completed 8-6-85	
Method Wash & Drive		Casing Size 4"	HNU 11.7/10.2	Protection Level D	
Ground El. 1124.1		Soil Drilled 41'	<u>2</u> below ground	Total Depth 151.0'	
Logged by J. Petersen		Checked by		Date	

Note: Had rotary pilot hole drilled from 0-114' without samples. See log for adjacent boring MW-158 pilot for soil conditions from 0-110'. MW-15D was drilled from the bottom of the pilot hole (114) to a depth of 151'.

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNU jar ppm	Comments on Advance of Boring	Monitoring	
							HNU	LEL
S-1	120.0 - 120.5	390/0.5	<u>0.5</u> 0.3	Lt. brown fine to med. sand w/ trace of silt; very dense wet	0.3	change @ 128' to a clayey silt	0.3	0
S-2	130.0 - 130.6	113-100/0.1	<u>0.6</u> 0.2	Lt. brown to gray clayey silt w/ trace of fine sand; stiff slightly plastic; moist	0.3	change @ 130.5' to clayey silt w/ sand seams, gravel	0.3	0
S-3	140.0 - 140.5	500/0.5	<u>0.3</u> 0.2	Gray slightly sandy silt; sand predominantly fine to v. fine stiff; slightly moist (Till?)	0.3	change @ 139' to a gray sandy silt (Till)	0.3	0
S-4	150.0 - 151.0'	65-250	<u>1.0</u> 0.7	Gray gravelly silty sand; sand predominantly fine to med.; very dense; wet (Till)	0.3		0.3	0
				Bottom of the Boring: 151'				

FIELD LOG SOIL				Boring No. MW-16 PILOT	
Project No 4465.91	Project Name Matamora Site Investigation			Page 1 of 1	
Contractor J. Mathee & Ass.	Driller E. Young	Date started 7-11-83	completed 7-12-83		
Method Mud Rotary	Casing Size 6"	HNU 11.7/10.2	Protection Level D		
Ground El 1101.3	Soil Drilled 90'	2' below ground	Total Depth 90'		
Logged by Emma/ White	Checked by	Date			

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNU jar ppm	Comments on Advance of Boring	Monitoring	
							HNU	LEL
S-1	10.0-11.5	6-11-12	$\frac{1.5}{0.8}$	Brown silty sand w/ trace of gravel; med. dense; moist Till-like	1.0		1.0	0
S-2	23.0-24.5	7-7-14	$\frac{1.5}{0.9}$	Lt. brown fine sand w/ trace of silt; dense; wet	1.0		1.0	0
S-3	30.0-31.5	13-22-22	$\frac{1.5}{1.2}$	Brown slightly silty med to fine sand w/ gravel; dense; moist; predominantly fine sand	1.0		1.0	0
S-4	40.0-41.5	25-19-25	$\frac{1.5}{1.0}$	Brown fine to coarse sand; loose; moist; transition to to finer sand	1.0		1.0	0
S-5	50.0-51.5	31-17-21	$\frac{1.5}{1.0}$	Lt. brown to gray gravelly med. to coarse sand; loose; no fines; wet	0.6		0.6	0
S-6	60.0-61.5	14-16-18	$\frac{1.5}{0.8}$	Dk. brown to dk. gray gravelly med. to coarse sand; loose wet; similar to S-5	0.6		0.6	0
S-7	70.0-71.5	31-26-28	$\frac{1.5}{1.5}$	Lt. brown med. to coarse sand w/ trace of gravel; loose; wet	0.6		0.6	0
S-8	80.0-81.5	28-34-46	$\frac{1.5}{1.5}$	Lt. brown slightly silty gravelly med. to coarse sand; loose; wet	0.6		0.6	0
S-9	90.0-91.0	50-100/0.5	$\frac{1.0}{0.2}$	Brown slightly silty med. to coarse sand and gravel; loose wet; no fines	0.6		0.6	0
				Bottom of pilot hole: 90'				

FIELD LOG SOIL				Boring No. MW-16	
Project No 4465.91		Project Name Matamorita Site Investigation		Page 1 of 1	
Contractor J. Mathas & Ass.		Driller T. Marlo		Date started _____ completed _____	
Method Wash & Drive		Casing Size 4"	HNU 11.7/10.2	Protection Level D	
Ground El 1101.3		Soil Drilled 20'	± below ground	Total Depth 110'	
Logged by C. White		Checked by _____		Date _____	

Note: See log for MW-16 pilot for soil conditions from 0-90'. MW-16 was drilled from the bottom of the pilot hole to a depth of 110'.

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNU jar. ppm	Comments on Advance of Boring	Monitoring	
							HNU	LEL
S-10	100.0 - 100.7	200-100/0.2	0.7 0.5	Brown med. to coarse sand and gravel; loose; wet; predom. coarse sand	0.5		0.5	0
S-11	110.0 - 111.7	76-82-95	1.7 1.4	Brown med. to coarse sand and gravel; loose; wet; similar to S-10 except slightly coarser	0.5		0.5	0
				Bottom of the Boring: 110'				

FIELD LOG SOIL				Boring No. MW-17S	
Project No 4465.91		Project Name Matamora Site Investigation		Page <u>1</u> of <u>1</u>	
Contractor J. Mathes & Ass.		Driller T. Fuhrhop		Date started 8-8-85 completed 8-9-85	
Method Wash & Drive		Casing Size 4"		HNU 11.7/10.2	
Ground El. 1069.4		Soil Drilled 19'		Protection Level D	
		Z below ground		Total Depth 74'	
Logged by P. Baker		Checked by		Date	

Note: Had rotary pilot hole drilled from 0-55' without samples. See log for adjacent boring MW-17D for soil conditions from 0-55'. MW-17S was drilled from the bottom of the pilot hole (55') to a depth of 74'.

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec	Description	HNU Jar	Comments on Advance of Boring	Monitoring	
							HNU	LEL
			Feet		ppm		ppm	% LEL
S-1	60.0-62.0	29-51-55	2.0 1.5	Brown fine to med. sand; dense wet	7.5	change @ 67' to clay change @ 68' to sand 65-70': wash clayey-silty sand	0.6	0
S-2	70.0-71.0	77-182	1.0 0.7	Brown fine sand; dense; wet; predominantly fine sand	3.0	70': wash water reddish brown 70-75': wash fine sand	0.2	0
				bottom of the boring: 74'				

FIELD LOG SOIL				Boring No. MW-17D PILOT	
Project NO 4465.91	Project Name Matamora Site Investigation			Page <u>1</u> of <u>1</u>	
Contractor J. Matheas & Ass.	Driller K. Young	Date started 7-26-85	completed 7-26-85		
Method Mud Rotary	Casing Size 6"	HNU 11.7/10.2	Protection Level 0		
Ground EL 1070.3	Soil Drilled 35'	<u>2</u> below ground		Total Depth 35'	
Logged by J. Peterson	Checked by	Date			

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec feet	Description	HNU Jar ppm	Comments on Advance of Boring	Monitoring	
							HNU ppm	LEL % LEL
S-1	10.0-11.5	16-25-28	<u>1.5</u> 1.0	Lt. brown to gray gravelly silty sand; dense; dry; Till-like	4.0		0.3	0
S-2	20.0-21.5	15-18-25	<u>1.5</u> 1.3	Lt. brown silty sand; sand predominantly fine to med.; med. dense; moist	4.5		0.3	0
S-3	30.0-31.5	8-14-21	<u>1.5</u> 1.3	Lt. brown slightly silty fine sand w/ trace of gravel; med. dense; moist	2.6		0.3	0
S-4	40.0-41.5	18-25-23	<u>1.5</u> 1.2	Lt. brown fine sand w/ trace of silt; med. dense; moist	7.0		0.3	0
S-5	50.0-51.5	43-30-25	<u>1.5</u> 1.2	Lt. brown gravelly fine to med. sand; med. dense; moist	6.0		0.3	0
				Bottom of the pilot hole: 35'				

FIELD LOG SOIL

Boring No. MW-17D

Project No 4465.91	Project Name Matamora Site Investigation	Page 1 of 1
Contractor J. Mathas & Ass.	Driller T. Marlo	Date started 8-8-85 completed 8-11-85
Method Wash & Drive	Casing Size 4"	HNU 11.7/10.2
Ground EL 1070.3	Soil Drilled 65'	Protection Level D
Logged by J. Peterson	Checked by	Date

Note: See log for MW-17D pilot for soil conditions from 0-55'. MW-17D was drilled from the bottom of the pilot hole (55') to a depth of 120'.

Sample No	Depth in Feet	Blows per 6 inches	Pen Rec Feet	Description	HNU jar ppm	Comments on Advance of Boring	Monitoring	
							HNU ppm	LEL %
S-6A	58.0-59.5	33-60-40	$\frac{1.5}{0.0}$	no recovery	---		0.3	0
S-6B	58.5-60.0	---	$\frac{1.5}{1.0}$	Lt. brown fine to med. sand w/ trace of gravel; dense; wet	1.0	Lt. brown clay-silt in wash @ 67'	0.3	0
S-7	69.5-71.0'	60-60-70	$\frac{1.5}{1.3}$	Lt. brown sandy silt w/ trace of gravel; dense; moist	6.0	change @ 73': increase in fine sand, less clay	0.3	0
S-8	80.0-81.3	94-140-150/0.3'	$\frac{1.3}{1.0}$	Lt. brown to gray fine to med. sand; very dense; wet	1.0	change @ 85': to fine sand	0.3	0
S-9	89.5-91.0	76-113-106	$\frac{1.5}{0.8}$	Lt. brown fine to med. sand; dense; wet; predominantly fine sand	1.0	96-98': fine sand 98-99': brown clay-silt 99-100': gray clay-silt	0.3	0
S-10	100.0 - 101.5	120-151-165	$\frac{1.5}{1.5}$	Lt. brown fine to med. sand; dense; wet; similar to S-9	0.3		0.3	0
S-11	110.0 - 111.5	20-47-225	$\frac{1.5}{0.5}$	Lt. brown fine to med. sand; dense; wet; similar to S-9	0.3	108': silt in wash	0.3	0
S-12	120.0 - 121.5	35-95-20	$\frac{1.5}{1.3}$	Gray slightly clayey sandy silt; w/ gravel; stiff; wet (Till)	0.3	change @ 117' to a dense gray fill	0.3	0
				Bottom of the Boring: 120'				

NUMBER 678

DATE 12-10-78

PAGE

WELL NUMBER B-4 TOTAL DEPTH 118' S.W.L. (BGL) dry

Sample Number	From Feet	to Feet	Lithologic Description
1	0	3	SAND: unsorted w/fine gravel
2	3	8	SAND: unsorted w/gravel, some silt
3	8	15	SAND: fine w/silt
4	15	20	SAND: fine, silty w/clay
(20-23)	20	28	SAND: med., unsorted w/med. gravel, larger gravel below 23'
6	28	33	SAND w/gravel, some clay
7	33	38	SAND: fine-med w/silt
(43-48)	38	58	SAND: unsorted w/gravel, some cobbles
(58-63)	58	68	SAND: unsorted, small gravel
(68-73)	68	118	SAND: unsorted w/gravel, some cobbles
			grade elevation: 1106.4 ft msl

Piezometer: ☐ Screen ☐ Pipe ☐ Total Depth (BGL) ☐

WELL NUMBER B-5/QW-1 TOTAL DEPTH 118' S.W.L. (BGL) 73'

Sample Number	From Feet	to Feet	Lithologic Description
1	0	3	CLAY: sandy, med. hard, mottled brown
2	3	11	CLAY: sandy, med. hard w/unsorted gravel
3	11	18	CLAY: sandy w/gravel, gray
4	18	25	CLAY: sandy & silty w/less gravel, gray
5	25	33	CLAY: v. sandy w/unsorted gravel, brown
(33-48)	33	70	GRAVEL: unsorted, cobbles, some clay
(48-58)			
(70-73)	70	118	SAND: unsorted w/fine gravel
			well point 88-90'
			bentonite seal @ 20'
			grade elevation: 1074.5 ft msl

Piezometer: ☐ Screen ☐ Pipe ☐ Total Depth (BGL) ☐

Core NUMBER 678 DATE _____ PAGE _____

BORING NUMBER B-9/OW-4 TOTAL DEPTH 75' S.W.L.(BGL) 21'

Sample Number	From to Feet	Lithologic Description
	0 - 8	REFUSE
1	8 - 13	SAND: unsorted, red-brn.
2	13 - 18	SAND w/silt, mostly fine-med.
3	18 - 23	SAND & GRAVEL: unsorted, some silt
4	23 - 75	CLAY: sandy, soupy, sat. @ 25'
		REFUSAL @ 75'
		screen set 21-23'
		bentonite seal 20'
		grade elevation: 1099.5 ft msl

Piezometer: ☒ Screen 924 Pipe 25' Total Depth (BGL) 23'

BORING NUMBER B-10 TOTAL DEPTH 93' S.W.L.(BGL) _____

Sample Number	From to Feet	Lithologic Description
1	0 - 3	SAND: unsorted, some silt
	3 - 18	REFUSE
2	18 - 23	SILT & FINE SAND
3	23 - 38	SILT w/fine gravel
4	38 - 43	SAND: silty w/unsorted gravel
5	43 - 48	SAND & GRAVEL: unsorted
6	48 - 93	PEBBLES: med.
		grade elevation: 1096.0 ft msl

Piezometer: ☐ Screen _____ Pipe _____ Total Depth (BGL) _____

S.W.L. (BGL)

Lithologic Description

10

RING NUMBER MA 16 TOTAL DEPTH _____ S.W.L. (BGL) _____

Sample Number	From ___ to ___ Feet	Lithologic Description
1-4	0 - 20	SAND & GRAVEL: fine/coarse, boulders, angular, increases sand w/depth & decreasing gravel w/depth
5-6	20 - 30	GRAVEL: angular, sand, fine/coarse grain, pieces of brown clay
7-8	30 - 40	GRAVEL: angular, sands, fine/coarse grain, pieces of gray clay
9	40 - 45	SILT, SAND & GRAVEL: pieces of gray clay
10	45 - 50	GRAVEL: angular, sands, silt, pieces of gray clay
11	50 - 53	SAND, GRAVEL, & SILT: pieces of gray clay, boulders at 53'
12	53 - 61	GRAVEL & SAND: pebbles/boulders
3-16	61 - 80	GRAVEL: angular, coarse sands, silt
17-20	80 - 100	SILT, SAND, & GRAVEL: angular pieces of reddish brown clay, decreasing clay with increasing silt with depth
21-28	100 - 146	SILT, GRAVEL, & SANDS: rough drill, trace of clay
29	146 - 151	CLAY: gray w/gravel, silt, sand, dry
		1 well screened from 98-100 ft, 110.5-112.5 ft., 123-125 ft., and 135.5-137.5 ft. B.G.L.
		Grouted w/bentonite from top to bottom
		Screens: 2/24" x 4"/#10 slot

Piezometer ☐ Screen ☒ Pipe 133.5 ft Total Depth (BGL)

1. Piezometer ☐ Screen _____ Pipe 150"x4" Total Depth (BGL) _____

Observation No. 11, Data

Project McLamora Landfill

[illegible]

APPENDIX B
COMPOSITE BORING LOGS

COMPOSITE BORING LOG

BORING NO. MW-9

PROJECT NO. 4466.91	PROJECT NAME : METADORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 10-86	SHEET <u>1</u> OF <u>1</u>
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[illegible]

COMPOSITE BORING LOG

BORING NO. MW-10S

PROJECT NO. 4465.91

PROJECT NAME METANDRA SITE INVESTIGATION

COMPILED BY C. WHITE

1 DATE 11-26

SHEET 1 OF 1

[illegible]

COMPOSITE BORING LOG

BORING NO. MW 10D

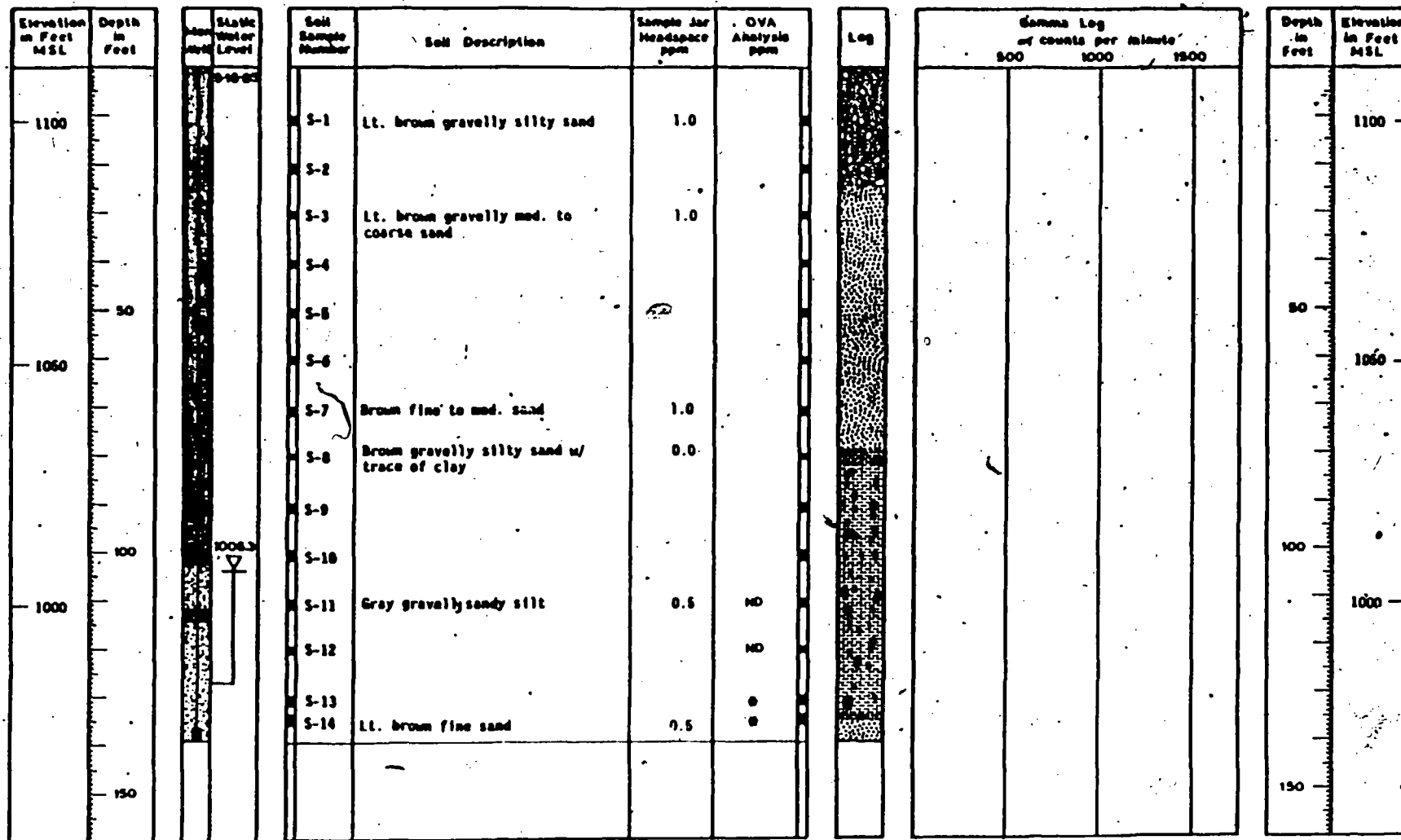
PROJECT NO. 4468.91	PROJECT NAME METADORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-86	SHEET 1 OF 1
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[illegible]

COMPOSITE BORING LOG

BORING NO. MW-11

PROJECT NO. 4466.91	PROJECT NAME METADORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-86	SHEET 1 OF 1
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JUNE 1989

FICHE # 006

COMPOSITE BORING LOG

BORING NO. MW-12

PROJECT NO. 4466.91

PROJECT NAME METAMORA SITE INVESTIGATION

COMPILED BY C. WHITE

DATE 11-86

SHEET 1 OF 1

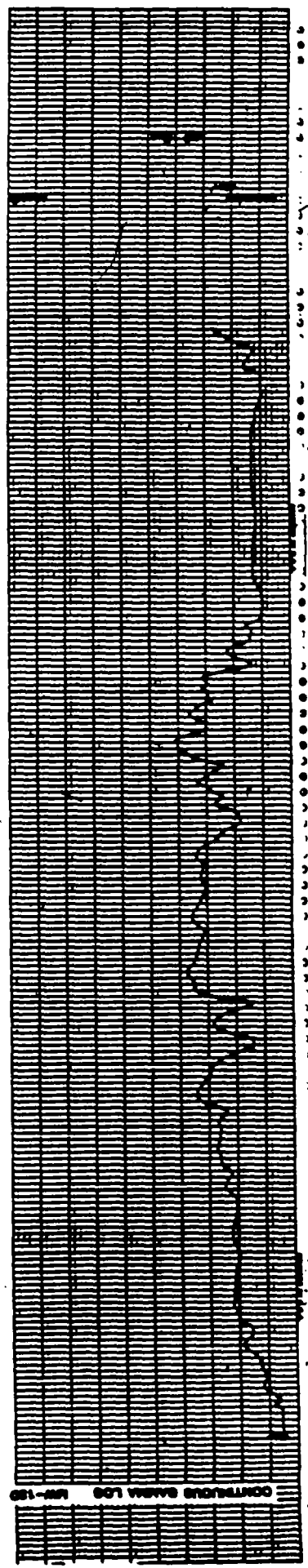
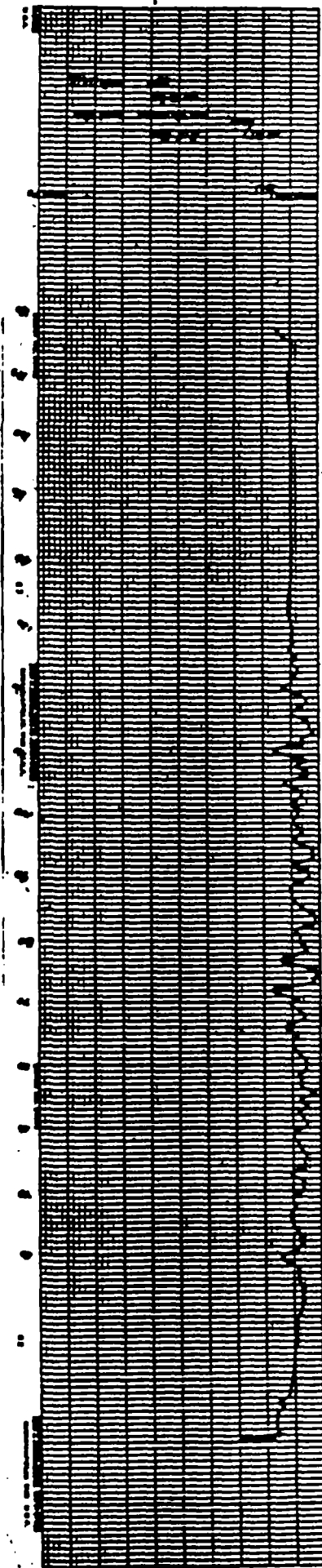
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-1100			S-1	Mottled brown to rusty brown clayey silt w/ fine sand layer sl. plastic	0.5					-1100
			S-2	Lt. brown slightly silty fine to coarse sand w/ gravel	0.5					
			S-3							
			S-4							
	80		S-5	Gray sl. silty fine to coarse sand w/ trace of gravel	0.5					
-1050			S-6	Lt. brown fine to med. sand w/ trace of silt	0.5					-1050
			S-7	Lt. fine to med. sand w/ trace silt	0.5					
			S-8	Lt. brown fine sand	0.5					
	100		S-9	Brown fine to med. sand w/ trace of coarse sand and gravel	0.5					
		1006.5	S-10							
-1000			S-11	Brown fine sand, thinly laminated w/ silt layers	1.0	NO				-1000
			S-12			NO				
	150		S-13			NO				

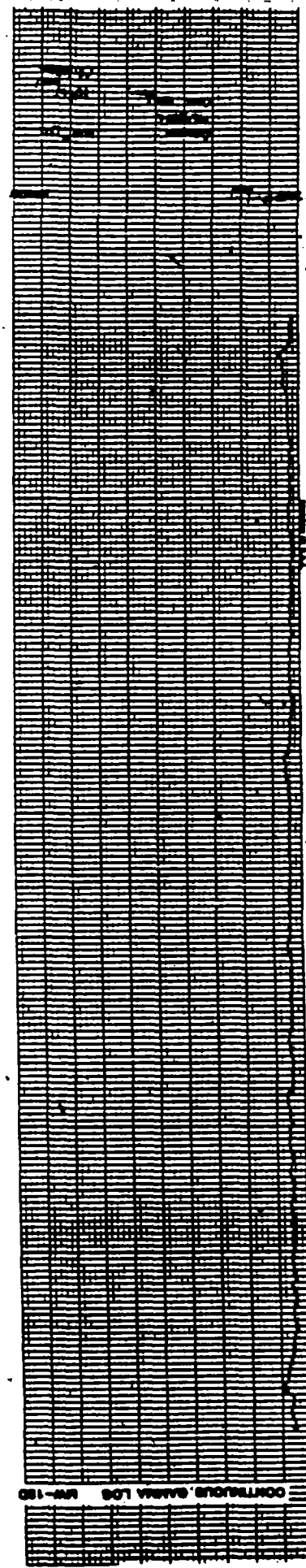
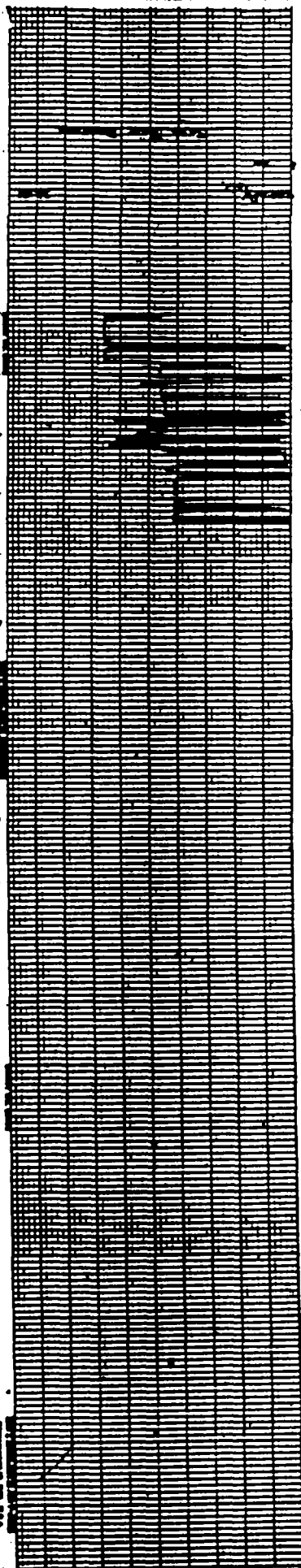
COMPOSITE BORING LOG

BORING NO. MW-13D

PROJECT NO. 4446.91	PROJECT NAME METADORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-05-83	SHEET 1 OF 1
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Elevation in Feet MSL	Depth in Feet	State Water Level	Soil Sample Number	Soil Description	Sample Jar Headspace ppm	OVA Analysis ppm	Log	Gamma Log of counts per minute			Depth in Feet	Elevation in Feet MSL
								500	1000	1500		
1000		1000.5										1000
			S-1	Gray silty fine sand	0.5	ND						
			S-2			ND						
			S-3			ND						
			S-4	Gray sandy silt w/ gravel	0.5							





COMPOSITE BORING LOG

BORING . NO. MW-14S

PROJECT NO. 4466.91	PROJECT NAME METADORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-86	SHEET <u>1</u> OF <u>2</u>
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Elevation in Feet MSL	Depth in Feet	Static Water Level	Soil Sample Number	Soil Description	Sample Jar Headspace ppm	OVA Analysis ppm	Log	Gamma Log of counts per minute 500 1000 1500	Depth in Feet	Elevation in Feet MSL
			S-1	Brown to reddish brown sl. silty mod. to coarse sand w/ trace of gravel	1.0					
			S-2	Lt. brown fine sand	1.0					
			S-3							
1100	80		S-4	Brown fine to med. sand w/ trace of coarse sand	1.0					1100
			S-5	Brown fine to coarse sand w/ gravel	0.5					
			S-6							
			S-7	Lt. brown fine to med. sand w/ trace of coarse sand	0.5					
1050	100		S-8							
			S-9							1050
			S-10	Brown fine sand	1.0					
			S-11	Fine to coarse sand and gravel and cobble fragments	0.5					
			S-12	Brown fine sand	0.0					
			S-13							

COMPOSITE BORING LOG

BORING NO. MW-135

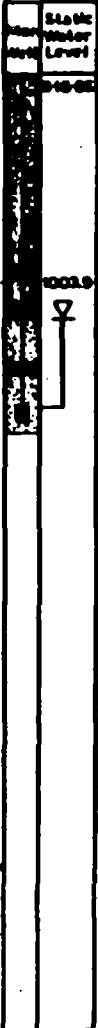
PROJECT NO. 4446.91	PROJECT NAME METAMORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-86	SHEET 1 OF 1
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COMPOSITE BORING LOG

BORING NO. MW-14D

PROJECT NO. 4466.91	PROJECT NAME METADORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-86	SHEET 1 OF 1
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Elevation in Feet MSL	Depth in Feet		Soil Sample Number	Soil Description	Sample Jar Headspace ppm	OVA Analysis ppm	Log	Gamma Log of counts per minute			Depth in Feet	Elevation in Feet MSL	
								500	1000	1500			
1000	180		S-1	Dark gray clay-silt	✓	NO					180	1000	
			S-2			NO							
			S-3		0.5	NO							

COMPOSITE BORING LOG

BORING NO. MW-145

PROJECT NO. 4465.91	PROJECT NAME METADORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-86	SHEET 2 OF 2
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Elevation in Feet MSL	Depth in Feet	Static Water Level	Soil Sample Number	Soil Description	Sample Jar Headspace ppm	OVA Analysis ppm	Log	Gamma Log of counts per minute			Depth in Feet	Elevation in Feet MSL
								500	1000	1500		
		1003.7										
			S-14	Brown med. to coarse sand	2.0	•						
			S-15	lt. brown fine to med. sand w/ trace of silt and coarse sand	0.4	•						
			S-17	Gray-silty clay to clayey silt thinly lam'd w/ silt layers	2.0	• • •						
			S-19	Gray gravelly sandy silt	2.0	NO						

BORING NO. MW-15S

PROJECT NO. 444.91	PROJECT NAME METAPORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-76	SHEET 1 OF 1
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[illegible]

COMPOSITE BORING LOG

BORING NO. MW-15D

PROJECT NO. 4464.91	PROJECT NAME METADORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-86	SHEET 1 OF 1
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Elevation in Feet MSL	Depth in Feet	Static Water Level	Soil Sample Number	Soil Description	Sample Jar Headspace ppm	OVA Analysis ppm	Log	Gamma Log or counts per minute			Depth in Feet	Elevation in Feet MSL
								500	1000	1500		
1000			S-1	Lt. brown fine to med. sand w/ trace of silt	0.3	•						1000
			S-2	Lt. brown to gray clayey silt w/ trace of fine sand	0.3	•						
			S-3	Gray slightly sandy silt	0.3	NO						
150			S-4	Gray gravelly silty sand	0.3	•					150	

COMPOSITE BORING LOG

BORING NO. MW-16

PROJECT NO. 446.91

PROJECT NAME	NETANDRA SITE INVESTIGATION
--------------	-----------------------------

COMPILED BY C. WHITE

DATE 11-06

SHEET 1 OF 1

[illegible]

BORING NO. MW-17S

BORING NO. MW-17S

PROJECT NO. 4466.91	PROJECT NAME METAMORA SITE INVESTIGATION	COMPILED BY C. WHITE	DATE 11-86	SHEET 1 OF 1
---------------------	--	----------------------	------------	--------------

[illegible]

APPENDIX C
DOMESTIC WELL LOGS

1004 (Rev. 12-68)

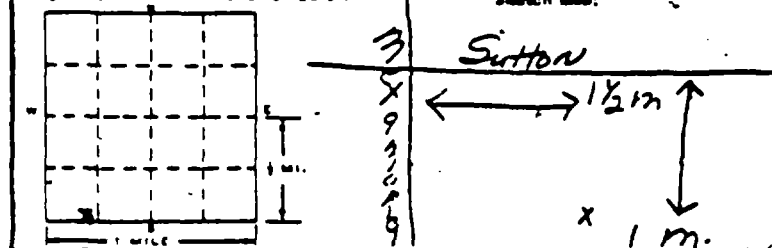
MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

ADD 04 1579

County	Township Name	Fraction	Section Number	Town Number	Range Number
2359	Atamora	51 1/2	2	6 N/S	10 E/W

3 OWNER OF WILL:
D-A Scout Ranch
Address 880 E. Sutton Rd.
Metamora, Pa. 48455

Shogun Man:



4 WILL DEPTH: (completion) Rate of Completion

200 - 1-24-79

5	☐ Cable tool	☒ Rotary	☐ Driven	☐ Dug
	☐ Hollow rod	☐ Jetted	☐ Bored	☐

6 USE: ☐ Domestic ☒ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Cell ☐

7 CASING: Threaded ☒ Welded ☐ Height: Above/Below ---

4 in. to 146 ft. Depth
in. to ft. Depth

SCREEN: _____

Type: _____ Dia.: _____

Slot/Gauge _____ Length _____

Set between _____ ft. and _____ ft.

Fit/ing: _____

9 STATIC WATER LEVEL
50 ft. below land surface

10 PUMPING LEVEL below land surface
150 ft. after 3 hrs. pumping 20 g.p.m.

ft. After hrs. pumping

11 WATER QUALITY in Parts Per Million: -----
Iron (Fe) _____ Chlorides (Cl) _____

Hardness	Other

12 WELL HEAD COMPLETION: ☐ In Approved Pit
☒ Pitless Adapter ☒ 12" Above Ground

13 Well Grouted? ☒ Yes ☐ No
☐ Next Cement ☐ Bentonite ☒ _____

Death: From Q H. to 1/16 H.

14 Nearest Source of possible contamination none

Well disinfectant upon completion ☒ Yes ☐ No

16 PUMP: ☐ Not installed
Manufacturer's Name CO. INC.

Model Number 150-1110 Volts 220
Length of Drop Pipe 1 1/2 ft. capacity 0.7 gal.

Type: ☒ Submersible
☐ Jet ☐ Rebreathing

INDEXED INFO BY SWILLER, ITEM 100
 * CHARGED BY
 ** ADDITION BY *C. Allen*
 ELECTION
 DEPT. TO GOVT

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

$$E/\nu \sim 970$$

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

REGISTERED BUSINESS NAME: THE J. M. SMITH CO. REGISTRATION NO: 0307

Address 1200 Inlay City Rd. 2202

Signed [Signature] Date 1-25-79

1973

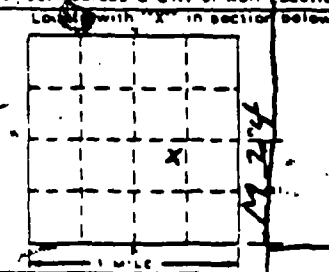
WATER WELL RECORD
ACT 284 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		Township Name		Fraction	Section Number	Town Number	Range Number
Lapeer		Metamora		SE 1/4 SW 1/4	#3	6 N.R.	10 E.W.
Distance and Direction from Road Intersections 1/4 M. E. of Metamora Rd., 300' N. of Stock Rd. Street Address & City of Well Location Loc. Me with "X" in section below				3 OWNER OF WELL: Donald Blair Address: [Redacted]			
Sketch Map: 				4 WELL DEPTH: (Completed) Date of Completion 260 ft. 9-27-73			
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well			
7 CASING: Threaded ☒ Welded ☐ Dia. _____ 4 in. to 216 ft. Depth Weight 11 lbs./ft. Drive Shoe? Yes ☒ No ☐				8 SCREEN: _____ Type: _____ Dia: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____			
9 STATIC WATER LEVEL: 1.5 ft. below land surface				10 PUMPING LEVEL below land surface 200 ft. after 1 hrs. pumping 30 g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.			
11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____				12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Prices Ascertained ☒ 12" Above Grade			
13 Well Grouted? ☒ Yes ☐ No ☐ Near Center ☐ Somewhat ☒ SDG Depth: From 0 ft. to 216 ft.				14 Nearest Source of possible contamination: none _____ feet _____ Direction _____ Type _____ Well disinfected upon completion ☐ Yes ☒ No			
15 PUMP: ☒ Not installed Manufacturer's Name Red Jacket Model Number R50N1 QBC HP 1/2 Volts 220 Length of Drop Pipe 84 ft. capacity 10 g.p.m. Type: ☒ Submersible ☐ Jet ☐ Reciprocating				16 Remarks, elevation, source of data, etc. Elevation 1015 [Signature]			
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora Well Drilling 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Inlay City Rd., Lapeer Signed [Signature] Date 9-28-73 AUTHORIZED REPRESENTATIVE				16 Remarks, elevation, source of data, etc. (continued)			

DEC 2 1976

WATER WELL RECORD

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		COUNTY		TOWN AND RANGE		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER																																								
LOCATION OF WELL: 1/4 mile North of Dyden Rd. 3/4 mile East of McDamora Ad. Street address & City of Well Location: McDamora 																																																		
2 FORMATION <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;">FORMATION</th> <th style="width: 10%;">THICKNESS OF STRATUM</th> <th style="width: 10%;">DEPTH TO BOTTOM OF STRATUM</th> </tr> </thead> <tbody> <tr><td>Top Soil & Clay</td><td>4</td><td>4</td></tr> <tr><td>Brown Sand & Clay</td><td>11</td><td>15</td></tr> <tr><td>Brown Sand</td><td>6</td><td>21</td></tr> <tr><td>Wet Brown Sand</td><td>31</td><td>52</td></tr> <tr><td>Blue Clay</td><td>10</td><td>62</td></tr> <tr><td>Gray Sand</td><td>32</td><td>94</td></tr> <tr><td>Blue Clay</td><td>6</td><td>100</td></tr> <tr><td>Blue Clay & Gravel</td><td>25</td><td>125</td></tr> <tr><td>Blue Clay & Sand</td><td>40</td><td>165</td></tr> <tr><td>Blue Clay & Gravel</td><td>5</td><td>170</td></tr> <tr><td>Shale</td><td>5</td><td>175</td></tr> <tr><td>Sand Stone</td><td>25</td><td>200</td></tr> </tbody> </table>						FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	Top Soil & Clay	4	4	Brown Sand & Clay	11	15	Brown Sand	6	21	Wet Brown Sand	31	52	Blue Clay	10	62	Gray Sand	32	94	Blue Clay	6	100	Blue Clay & Gravel	25	125	Blue Clay & Sand	40	165	Blue Clay & Gravel	5	170	Shale	5	175	Sand Stone	25	200	3 OWNER OF WELL: Bay Rapaport WELL DEPTH: 200 ft. Date of Completion: 9-15-76 5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial 6 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface <u>17</u> ft. Diam. <u>4</u> in. to <u>176</u> ft. Depth Weight <u>11</u> lbs./ft. <u> </u> in. to <u> </u> ft. Depth Drive Shoe? yes ☒ 8 SCREEN: Type: _____ Dia.: _____ Size/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: <u>Rock well</u> 9 STATIC WATER LEVEL: <u>45</u> ft. below land surface 10 PUMPING LEVEL below land surface: <u>42</u> ft. after 2 hrs. pumping <u>25</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m. 11 WATER QUALITY IN Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____ 12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Wellhead Adapter ☐ 12" Above Ground 13 Well Grouted? ☐ Yes ☒ No ☐ Heat Cement ☐ Mortar ☐ Grout Depth From _____ ft. to _____ ft. 14 Nearest Source of possible contamination: <u>SE Direction Sept Tank</u> Well disinfected upon completion ☒ Yes ☐ No 15 Pump: ☐ Not Installed Manufacturer's Name <u>Rapaport</u> Model Number <u>SSP 7-10 HP 1/2</u> Voltage <u>230</u> Length of Drop Pipe <u>100</u> ft. capacity <u>100</u> g.p.m. Type: ☒ Submersible ☐ Rotorpump					
FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM																																																
Top Soil & Clay	4	4																																																
Brown Sand & Clay	11	15																																																
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Blue Clay	6	100																																																
Blue Clay & Gravel	25	125																																																
Blue Clay & Sand	40	165																																																
Blue Clay & Gravel	5	170																																																
Shale	5	175																																																
Sand Stone	25	200																																																
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. _____ CONNECTED BY _____ ADDITION BY <u>Gm</u> ELEVATION _____ DEPTH TO ROCK _____						17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Daniel Johnson & Sons</u> REGISTRATION NO. _____ Address <u>1185 Barr Rd.</u> Signed <u>Daniel Johnson</u> 9-15-76																																												

APR 1976

3-3

WATER WELL RECORD
ACT 204 PA 1965MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL			3 OWNER OF WELL		
County	Township Name	Fraction	Section Number	Town Number	Range Number
Lapeer	Metamora	SE SE (SW)	3	6 N.E.	10 E.W.
Distance and Direction from Road Intersection: 1/2 Mi. E. of Metamora Rd. 50' N. of Stock Rd. Street address & City of Well Location: 257 Stock Rd.			Address: [Redacted]		
Locality with 1" = 1/4" section below: 			4 WELL DEPTH: (completion) Date of Completion 260 ft. 3-15-76		
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jetted ☐ Bored			6 USE: ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well		
7 CASING: Threaded ☐ Welded ☐ Height: Above/Surface Diam. Surface 1 ft.			8 SCREEN: ☐ Type: _____ Dia.: _____ Size/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____		
9 STATIC WATER LEVEL 60 ft. below land surface			10 PUMPING LEVEL below land surface 110 ft. after 3 hrs. pumping 40. S.S.M. _____ ft. after _____ hrs. pumping _____ S.S.M.		
11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____			12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Ground		
13 Well Grouted? ☒ Yes ☐ No ☐ Near Cement ☐ Bentonite ☐ SDC Depth: From 0 ft. to 212 ft.			14 Nearest Source of possible contamination 75 feet N Direction Septic Type Well disinfected upon completion ☒ Yes ☐ No		
15 PUMP: ☐ Not Installed Manufacturer's Name Red Jacket Model Number R50N1 9BC H.P. 220 Length of Drop Pipe 105 ft. capacity 10 G.P.M. Type: ☒ Submersible ☐ Jet ☐ Raising/lifting			16 Remarks, elevation, source of data, etc. ADD'D INFO BY DRILLER ITEM NO. *CORRECTED BY **ADDITION OF CHM ELEVATION DEPTH TO PUMP Elev. ~ 1035		
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora All Drilling 0392 Address 1200 Inley City Rd., Lapeer Signed [Signature] Date 3-18-76 AUTHORIZED REPRESENTATIVE			18 Remarks, elevation, source of data, etc. (continued)		

WATER WELL RECORD
ACT 294 PA 1986MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

JUL 22 1981

1 LOCATION OF WELL	County <u>Lapeer</u>	Township Name <u>Metamora</u>	Fraction <u>NE 1/4</u>	Section Number <u>3</u>	Town Number <u>26</u>	Range Number <u>R10E</u>
--------------------	----------------------	-------------------------------	------------------------	-------------------------	-----------------------	--------------------------

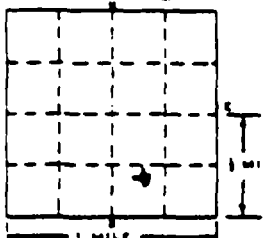
Distance And Direction from Road Intersections

Fox Hill 387 Stock Rd.

Street address & City of Well Location

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL:

Robert D. Tucker

4 WELL DEPTH: (completed) Date of Completion

320 ft. June 23 77

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig
☐ Hollow rod ☐ Jetted ☐ Bored

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well

7 CASING: Threaded ☐ Welded ☐

Height: Above/Below

5 in. to 253 ft. Depth Weight 200 lbs./ft.
 in. to ft. Depth Drive Shee? Yes ☐ No ☒

8 SCREEN:

rock well

Type: _____ Dia: _____

Slot/Gauge _____ Length _____

Set between _____ ft. and _____ ft.

Fittings: _____

9 STATIC WATER LEVEL

90 ft. below land surface

10 PUMPING LEVEL below land surface

100 ft. after 1/2 hrs. pumping 20 g.p.m.

_____ ft. after _____ hrs. pumping _____ g.p.m.
 _____ ft. after _____ hrs. pumping _____ g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) _____ Chlorides (Cl) _____

Hardness _____ Other _____

12 WELL HEAD COMPLETION: ☐ In Approved Pit☐ Pitless Adapter ☒ 12" Above Grade13 Well Grouted? ☒ Yes ☐ No☐ Neat Cement ☒ Grout Drilling mud

Depth: From 0 ft. to 253 ft.

14 Nearest Source of possible contamination

75 feet SE Direction Septic tank TypeWell disinfected upon completion: ☒ Yes ☐ No

15 PUMP:

☒ Not installed

Manufacturer's Name _____

Model Number _____ HP _____ Volts _____

Length of Drop Pipe _____ ft. capacity _____ G.P.M.

Type: ☐ Submersible☐ Jet ☐ Rechargeable

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
yellow sand & gravel with small boulders	50	50
gray sand & gravel	100	150
gray, sandy stoney clay	90	240
sandstone shaley	10	250
sandstone	60	310
gray shale	10	320

60 ft 4" pvc liner set between 190 ft & 250 ft

16 Remarks, elevation, source of data, etc.

ADDED INFO BY DRILLER, ITEM NO.

CORRECTED BY

ADDITION BY

ELEVATION

DEPTH TO ROCK

Elev ~ 1055

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Hazard Well Drilling 0354

REGISTERED BUSINESS NAME REGISTRATION NO.

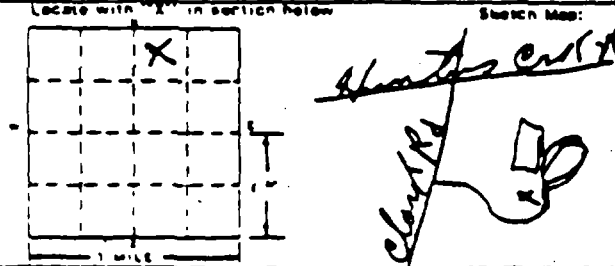
Address 6386 Oriole Dr., Flint, MI.

Signed William J. Hazard Date July 1, 77

AUTHORIZED REPRESENTATIVE

FEB 28 1990

WATER WELL RECORD
ACT 234 PA 1988357 MICHIGAN DEPARTMENT
OF PUBLIC HEALTH

1 LOCATION OF WELL County: <u>Lapeer</u> Township: <u>Northwestern</u> Fraction: <u>NE 1/4</u> Section Number: <u>4</u> Tenth Number: <u>6</u> Range Number: <u>10</u>	
Distance and Direction from Road Intersection: <u>1/2 mile south of Hunter Creek Rd</u> Street Address & City of Well Location: <u>on Clark Rd Throckmorton</u>	
Locate with "X" in section below: 	
3 OWNER OF WELL: <u>Erud Alarich</u> Address: [REDACTED]	
4 WELL DEPTH: (completed) Date of Completion: <u>2-27-79</u>	
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ dug ☐ Hollow rod ☐ Jetted ☐ Sored	
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well	
7 CASING: Threaded ☒ Welded ☐ Height: Above Ground Surface <u>1</u> ft. 4 in. to 189 ft. Depth Weight <u>11</u> lbs./ft. 378 ft. to 71 ft. Depth Drive Shoe? ☒ Yes ☐ No	
8 SCREEN: Type: _____ Dia.: _____ Slot Gauge: <u>1/8" screen</u> Set between _____ ft. and _____ ft. Fittings: _____	
9 STATIC WATER LEVEL: <u>40</u> ft. below land surface	
10 PUMPING LEVEL below land surface: <u>50</u> ft. after 1 hrs. pumping <u>50</u> p.s.f. <u>50</u> ft. after 1/2 hrs. pumping <u>50</u> p.s.f.	
11 WATER QUALITY in Parts Per Million: Iron (Pp) <u>N</u> Chloride (Pp) <u>N</u> Hardness _____ Other _____	
12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Private Access ☐ 12" Above Grade	
13 Well Grouted? ☒ Yes ☐ No ☐ Near Cement ☐ Grout Depth: From _____ ft. to <u>189</u> ft.	
14 Nearest Source of possible contamination: <u>75</u> feet <u>N</u> Direction <u>Septic</u> Type _____ Well disinfected upon completion: ☒ Yes ☐ No	
15 PUMP: ☐ Not installed Manufacturer's Name: <u>Redington</u> Model Number: <u>2ER415</u> 1/2 HP <u>230</u> Volts Length of Drop Pipe: <u>105</u> ft. capacity <u>1.5</u> g.p.m. Type: ☒ Submersible ☐ Jet ☐ Reciprocating	
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. _____ *CORRECTED BY _____ **ADDITION BY _____ ELEVATION _____ DEPTH TO ROCK _____	
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Robert Brown</u> 74D1083 REGISTERED BUSINESS NAME REGISTRATION NO. _____ Address <u>3997 Hunter Rd Altam</u> Signed <u>Robert Brown</u> Date <u>2-28-79</u> ACT. AUTH. REPRESENTATIVE	

MAR 9 1975

4-1

WATER WELL RECORD
ACT 394 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL

County <u>Washtenaw</u>	Township Name <u>Metamora</u>	Fraction <u>3E</u>	Section Number <u>4</u>	Town Number <u>96 N.E.</u>	Range Number <u>10 E.W.</u>
Distance and Direction from Road Intersection <u>1/4 M.S. of Sullon Rd</u> <u>3333 Metamora Rd.</u>			3 OWNER OF WELL: <u>Rider Custom Homes</u> <u>16422 Fenton Pk. Mich.</u>		
Street address & City of Well Location			4 WELL DEPTH: (Completed) Date of Completion <u>70</u> ft. <u>11-4-74</u>		
Locate with "X" in section below			5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☒ Hollow rod ☐ Jotted ☐ Bored		
Sketch Map:			6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well		
Locate with "X" in section below			7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Diam. <u>2</u> in. to <u>62</u> ft. Depth Surface <u>1</u> ft. Weight <u>375</u> lbs./ft. Drive Shoe? Yes ☒ No ☐		

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	8 SCREEN:
<u>stoney sand</u>	<u>15</u>	<u>15</u>	Tr. <u>clayton mesh</u> Dia. <u>1 1/4"</u> I.D.
<u>Clay</u>	<u>12</u>	<u>27</u>	Top/Ground <u>1 in</u> Length <u>9 FT</u>
<u>sand</u>	<u>4</u>	<u>31</u>	Set between <u>61</u> ft. and <u>70</u> ft. DROP CHECK Fittings: <u>1 FT. 1/4" STAND PIPE VALVE</u> <u>52 ft.</u>
<u>Real stoney Clay</u>	<u>29</u>	<u>60</u>	9 STATIC WATER LEVEL <u>20</u> ft. below land surface
<u>sand & gravel</u>	<u>10</u>	<u>70</u>	10 PUMPING LEVEL below land surface <u>40</u> ft. after <u>1</u> hrs. pumping <u>600</u> g.p.m. ft. after ___ hrs. pumping ___ g.p.m.
			11 WATER QUALITY in Parts Per Million: Iron (Fe) ___ Chlorides (Cl) ___ Hardness ___ Other ___
			12 WELL HEAD COMPLETION: ☐ in Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade
			13 Well Grouted? ☒ Yes ☐ No ☐ Seal Cement ☐ Bentonite ☐ Depth: From <u>1</u> ft. to <u>59</u> ft.
			14 Nearest Source of possible contamination ___ feet ___ Direction ___ Type ___ Well disinfected upon completion ☒ Yes ☐ No
			15 PUMP: ☒ Not installed Manufacturer's Name ___ Model Number ___ HP ___ Vols ___ Length of Drop Pipe ___ ft. capacity ___ G.P.M. Type: ☐ Submersible ☐ Jet ☐ Reelwinding

USE A 2ND SHEET IF NEEDED

16 Remarks. 1000 FT. DEPTH

*CORRECTED BY

**ADDITION BY G.M.

ELEVATION

CLIM TO ROCK

Elev. ~ 960

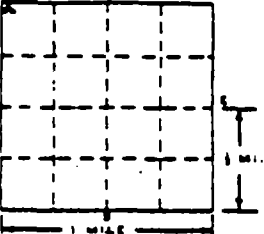
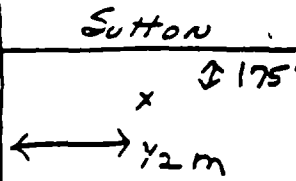
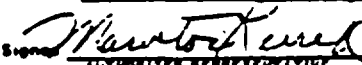
17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

HEMES WELL DRILLING 0345Address 227 Lincoln Manor DrSigned James Hemes Date 11-4-74
AUTHORIZED REPRESENTATIVE

JAN 09 1973

WATER WELL RECORD
ACT 284 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		County		Township Name		Fraction		Section Number		Town Number		Range Number	
Lapeer		Metamora		N. 1/2 Sec. 4		4		6		N. 1/2		10 E.W.	
Distance And Direction from Road Intersections 1/2 mi. E. of S. Lapeer Rd. 175' S. of Sutton Rd. Street address & City of Well Location 741 Sutton Rd.				3 OWNER OF WELL: Future Homes, Gary Sabo Address 2216 Hillwood Davison, MI 48423				4 WELL DEPTH: (completed) Date of Completion 220 ft. 12-18-78					
Locate with "X" in section below 				Sketch Map: 				5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well					
2 FORMATION				THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		7 CASING: Threaded ☒ Welded ☐ Diam. 4 in. to 157 ft. Depth 1 ft. Surface 1 ft. Weight 11 lbs./ft. Drive Shoe? yes ☒ No ☐					
Sand & gravel				18		18		8 SCREEN: Type: _____ Dia.: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____					
Clay, sand & gravel				39		57		9 STATIC WATER LEVEL 0 ft. below land surface					
Clay				100		157		10 PUMPING LEVEL below land surface 66 ft. after 5 hrs. pumping 55 S.P.M. _____ ft. after _____ hrs. pumping _____ S.P.M.					
Sandstone				63		220		11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____					
								12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade					
								13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ SDG Depth: From _____ ft. to 157 ft.					
								14 Nearest Source of possible contamination 175 feet _____ Direction Septic Type Well disinfected upon completion ☒ Yes ☐ No					
								15 PUMP: ☐ Not installed Manufacturer's Name Red Jacket Model Number F100N1 800HP 1 vers 220 Length of Drop Pipe 63 ft. capacity 16 G.P.M. Type: ☒ Submersible ☐ Jet ☐ Reciprocating					
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. *CORRECTED BY **ADDITION BY ELEVATION DEPTH TO ROCK								17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. METAMORA WELL DRILLING 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Imley City Rd., Lapeer Signed  Date 12-26-78 AUTHORIZED REPRESENTATIVE					

WATER WELL RECORD
ACT 294 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		Township Name		Fraction	Section Number	Town Number	Range Number
County: <u>Lapeer</u>		<u>Metamora</u>		<u>E 1/2</u>	<u>4</u>	<u>6</u> N/4	<u>10</u> E/4
Distance And Direction from Road Intersections				3 OWNER OF WELL:			
<u>3435 Metamora Rd., Metamora, Mich.</u>				Address: <u>R & J Homes</u> <u>8441 Ridge Rd.</u> <u>Goodrich, Mich.</u>			
Street Address & City of Well Location				4 WELL DEPTH: (Completed) Date of Completion			
Loc. No. with "X" in section below				<u>71</u> ft. <u>Oct. 23, 1973</u>			
Sketch Map:				5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig			
				☐ Hollow rod ☐ Jetted ☐ Bored ☐			
				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry			
				☐ Irrigation ☐ Air Conditioning ☐ Commercial			
				☐ Test Well ☐			
				7 CASING: Threaded ☐ Welded ☒ Height: Above/Below			
				Dish: <u>4</u> in. to <u>67</u> ft. Depth: <u>19.89</u> ft.			
				Surface <u>1</u> ft. Weight <u>19.89</u> lbs./ft.			
				Drive Shoe? Yes ☒ No ☐			
2 FORMATION				8 SCREEN:			
THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		Type: <u>Stainless</u> Dia: <u>3 5/8</u>			
<u>Sand & gravel</u>	<u>26'</u>	<u>26'</u>		Size/Gauge <u>12</u> Length <u>4'</u>			
<u>Blue clay</u>	<u>18'</u>	<u>44'</u>		Set between <u>67</u> ft. and <u>71</u> ft.			
<u>Clay & sand</u>	<u>23'</u>	<u>67'</u>		Fittings: <u>K-Packer</u>			
<u>Sand & gravel water</u>	<u>04'</u>	<u>71'</u>		9 STATIC WATER LEVEL			
				<u>36</u> ft. below land surface			
				10 PUMPING LEVEL below land surface			
				<u>38</u> ft. after <u>1</u> hrs. pumping <u>20</u> S.S.M.			
				ft. after ___ hrs. pumping ___ S.S.M.			
				11 WATER QUALITY in Parts Per Million			
				Iron (Fe) ___ Chlorides (Cl) ___			
				Hardness ___ Other ___			
				12 WELL HEAD COMPLETION. ☐ In Approved Pit			
				☒ Pitless Adapter ☐ 12" Above Grade			
				13 Well Grouted? ☐ Yes ☒ No			
				☐ Neat Cement ☐ Mortar ☐			
				Depth: From ___ ft. to ___ ft.			
				14 Nearest Source of possible contamination			
				___ feet ___ Direction ___ Type			
				Well disinfected upon completion ☒ Yes ☐ No			
				15 PUMP: ☐ Not installed			
				Manufacturer's Name <u>Sta Rita</u>			
				Model Number <u>RBAC2</u> HP <u>1/2</u> Volts <u>230</u>			
				Length of Drive Pipe <u>52</u> ft. capacity <u>8</u> G.P.M.			
				Type: ☒ Submersible			
				☐ Jet ☐ Reciprocating			
16 Remarks, elevation, source of data, etc.				17 WATER WELL CONTRACTOR'S CERTIFICATION:			
ADDED INFO BY DRILLER, ITEM NO.				This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.			
CORRECTED BY				Signature <u>James H. Lymann</u> REG. STATE NO. <u>0615</u>			
MODIFIED BY				Address <u>10275 Eagle Rd., Davidsburg, Mich.</u>			
ELEVATION				Signed <u>James H. Lymann</u> Date <u>11/25/73</u>			
DEPTH TO ROCK				DRILLER'S REPRESENTATIVE			

01 011574

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		2 TOWN AND NAME		3 FRACTION		4 SECTION NUMBER		5 TOWN NUMBER		6 RANGE NUMBER	
Lapeer		Metamora		NE 1/4 NW 1/4 NE 1/4		4		6		10 E/MK	
Distance and Direction from Road Intersections 1/8 M. W. of Metamora Rd. 150' S. of Sutton Rd., Street Address & City of Well Location <u>53 Sutton Rd., Metamora</u>											
Locate with "X" in section below 				Sketch/Map: 							
2 FORMATION				THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM					
Clay				66		66					
Gravel				4		70					
Clay & Gravel				78		148					
Sandstone				52		200					
3 OWNER OF WELL: <u>Donald Leonard</u> Address: <u>[REDACTED]</u>											
4 WELL DEPTH: (Completed) Date of Completion <u>200</u> ft. <u>6-20-74</u>											
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jotted ☐ Bored ☐											
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐											
7 CASING: Threaded ☒ Welded ☐ Weight: Above/Below --- ft. <u>4</u> in. to <u>148</u> ft. Depth Surface <u>1</u> ft. in. to --- ft. Depth Weight <u>11</u> lbs./ft. Drive Shoe? Yes ☐ No ☐											
8 SCREEN: <u>-----</u> Type: _____ Dia: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____											
9 STATIC WATER LEVEL <u>30</u> ft. below land surface											
10 PUMPING LEVEL below land surface <u>65</u> ft. after <u>1</u> hrs. pumping <u>40</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.											
11 WATER QUALITY in Parts Per Million: _____ Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____											
12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade											
13 Well Grouted? ☒ Yes ☐ No ☐ Near Casing ☐ Bentonite ☒ SDG Depth: From <u>0</u> ft. to <u>148</u> ft.											
14 Nearest Source of possible contamination <u>100</u> feet <u>SE</u> Direction <u>Septic</u> Type _____ Well disinfected upon completion ☒ Yes ☐ No											
15 PUMP: ☐ Not installed Manufacturer's Name <u>Red Jacket</u> Model Number <u>R50N1 9BC</u> HP <u>2</u> Volts <u>220</u> Length of Drop Pipe <u>63</u> ft. capacity <u>16</u> g.p.m. Type: ☒ Submersible ☐ Jet ☐ Reciprocating											
16 Remarks, elevation, source of data, etc. ADDED INFO: <u>OWNER: [REDACTED]</u> <u>ELV. ~ 970</u> DEPTH TO ROCK <u>160</u>											
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Metamora Well Drilling</u> 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>1200 Inlay City Rd., Lapeer</u> Signed <u>Phyllis L. Kersh</u> Date <u>6-26-74</u>											

WATER WELL RECORD

ACT 204 PA 1906

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL

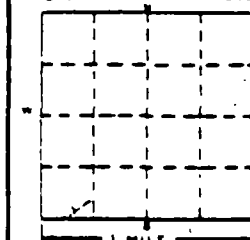
County Lapeer Township Name McBride Fraction SE 1/4 Sec 5 x SW 1/4 Section Number 9 Town Number 1 Range Number 10 E.A.M.

Distance and Direction from Road Intersections
4 miles south of Dryden Rd on
13 mi 15 and 16 mi

Street address & City of Well Location

Locate with "X" in section below

Sketch Map: N



McBride Rd Dryden

3 OWNER OF WELL:

James Finch

Address [Redacted]

4 WELL DEPTH: (Constant) Date of Completion

275 ft. 1-7-81

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig
☐ Hollow rod ☐ Jetted ☐ Bored

6 USE: ☐ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well

7 CASING: Threaded ☒ Welded ☐ Height: Above/Below
Diam. 1 ft.

LI 210 ft. Depth 1 ft. Weight 1 lbs./ft.
DI 65 ft. Depth Drive Shoe? Yes ☒ No ☐

8 SCREEN:

Type: None Dia.: None
Size/Gauge None Length None
Set between None ft. and None ft.
Fittings: None

9 STATIC WATER LEVEL

50 ft. below land surface

10 PUMPING LEVEL below land surface

100 ft. after 1 hrs. pumping 75 S.D.M.
125 ft. after 2 hrs. pumping -5 S.D.M.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) None Chlorides (Cl) None
Hardness None Other None

12 WELL HEAD COMPLETION: ☐ In Approved Pit

☐ Pitless Adapter ☒ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No

☐ Near Cement ☐ Bentonite ☒ Filter Pack
Depth: From land to 210 ft.

14 Nearest Source of possible contamination

90 feet E Direction duplex Type None
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

☒ Not installed
Manufacturer's Name None
Model Number None HP None Volts None
Length of Drop Pipe None ft. capacity None G.P.M.
Type: ☐ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of water, etc.

ADDED INFO BY DRILLER, ITEM NO. Loc?
CORRECTED BY None
REVISION BY None
DATE 1-7-81

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Robert Thompson WD 1083
REGISTERED BUSINESS NAME None REGISTRATION NO. None
Address 3997 Haines Rd. Okla
Signed Robert Thompson Date 1-7-81
AUTHORIZED REPRESENTATIVE

SEP 07 1973

9-3

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		TOWNSHIP Name		Range Number		Section Number		Town Number		Range Number	
Lapeer		Metamora		10 E.T.		9		6 N.T.		10 E.T.	
Distance And Direction from Road Intersections											
1/4 MILE NORTH OF DAYDEN ON METAMORA RD EAST SIDE OF ROAD											
Sketch Map:											
2 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		3 OWNER OF WELL:					
20' SAND		20'		20'		[Redacted]					
46' BLUE CLAY		46'		66'		4 WELL DEPTH: (Completed) Date of Completion					
4' COARSE GRAVEL		4'		70'		70 ft. 6-15-73					
5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well											
6 CASING: Threaded ☒ Welded ☐ Height: Above Ground Surface 12" ft. Weight 3.75 lbs./ft. Drive Shoe? Yes ☒ No ☐											
7 SCREEN: Type: Johnson Dia.: 1 1/2" Slot: 21-10 Length: 12' Set between 66 ft. and 70 ft. Fittings: 2-1 1/2 Couplings 5' 1/2 PIPE											
8 STATIC WATER LEVEL 40 ft. below land surface											
10 PUMPING LEVEL below land surface 40 ft. after 3 hrs. pumping 120 S.G.P.											
11 WATER QUALITY in Parts Per Million: Iron (Fe) ☒ Chloride (Cl) ☒ Hardness ☒ Other ☒											
12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade											
13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ Drill Mud Depth: From ft. to ft.											
14 Nearest Source of possible contamination 20 feet EAST Direction SEPTIC Type Well disinfected upon completion ☒ Yes ☐ No											
15 PUMP: ☐ Not installed ☒ Manufacturer's Name HP VARS Model Number Length of Drive Pipe ft. Capacity G.P.M. Type: ☒ Submersible ☐ Jet ☐ Recirculating											
16 Remarks, elevation, source of data, etc. Elev. ~ 1025											
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Registered Business Name Address 734 Cassette Rd. FOSTON Signed Date 6-18-73											

100w Rev. 12-88.

FEB 13 1981

WATER WELL RECORD
ACT 294 PA 1985MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL

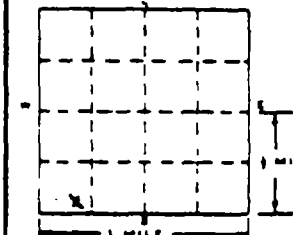
County: Lebanon Township: Millersburg Fraction: 5th SW (SW) Section Number: 9 Town Number: 6 Range Number: 19 E/W.

Distance and Direction from Road Intersection:
3/4 mile East of M24 on Dryden Rd. at intersection with private Dr.

Street address & City of Well Location

Locate with "X" in section below

Sketch Map:



Sketch Map:
M24
Dryden Rd

2 FORMATION

THICKNESS
OF
STRATUMDEPTH TO
BOTTOM OF
STRATUM

<u>Red clay</u>	<u>13</u>	<u>13</u>
<u>Gravelly</u>	<u>60</u>	<u>73</u>
<u>Gravel WB</u>	<u>55</u>	<u>108</u>
<u>Blue claystone</u>	<u>70</u>	<u>178</u>
<u>Gravel WB</u>	<u>15</u>	<u>193</u>
<u>Blue clay</u>	<u>30</u>	<u>223</u>
<u>Red sandstone</u>	<u>12</u>	<u>235</u>
<u>set pipe</u>		
<u>Red sandstone</u>	<u>10</u>	<u>245</u>
<u>Sandy shale Blue</u>	<u>30</u>	<u>275</u>

3 OWNER OF WELL:

Address

David Finch

4 WELL DEPTH: (completed) Date of Completion

275 ft. 12-10-80

☐ Cable tool ☒ Rotary ☐ Driven ☐ dug
☐ Hollow rod ☐ Jammed ☐ Bored

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well

7 CASING: Threaded ☒ Welded ☐

Height: Above/Below

4 in. to 235 ft. Depth
1 in. to 42 ft. Depth
Height: Above/Below
Surface 1 ft.
Weight 11 lbs./ft.
Drive Shoe? Yes ☒ No ☐

8 SCREEN:

Type: Disc
Size/Gauge 1/2" Length 10'
Set between 1 ft. and 1 ft.
Fittings:

9 STATIC WATER LEVEL

70 ft. below land surface

10 PUMPING LEVEL below land surface

90 ft. after 1 hrs. pumping 50 g.p.m.
90 ft. after 2 hrs. pumping 50 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) 1 Chloride 1
Hardness 1 Other 1

12 WELL HEAD COMPLETION: ☐ In Approved Pit

☐ Pitless Adapter ☒ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No

☐ Neat Cement ☐ Grout
Depth: From 1 ft. to 235 ft.

14 Nearest Source of possible contamination

75 feet SE Direction Septic Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

☒ Not installed

Manufacturer's Name

Model Number

Length of Drop Pipe

Type: ☐ Submersible☐ Jet☐ Reciprocating

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

Access to well: Driller, I&M Co

Installed by

Inspection by SPN

Elevation

Date to 402A

ENR ~ 1040

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Ruben Raymond WD1083

REGISTERED BUSINESS NAME

Address 3997 Hains Rd Allen

Signed Ruben Raymond Date 12-17-80

AUTHORIZED REPRESENTATIVE

OCT 04 1970

WATER WELL RECORD

ACT 204 PA 1966

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL

County EDSSEY	Township Name Metamora	Fraction NEW NEW	Section Number 9	Town Number 6 N/S.	Range Number 10 E/W.
-------------------------	----------------------------------	----------------------------	----------------------------	------------------------------	--------------------------------

Distance And Direction from Road Intersections

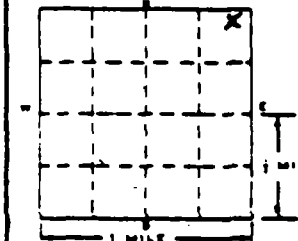
250' E. of Metamora Rd.

100' S. of Stock Rd.

Street Address & City of Well Location **3485 Metamora Rd.**

Locate with "X" in section below

Sketch Map:



Stock Rd

↓ 100'

← 250'

3 OWNER OF WELL:

Robert Campbell

Address

4 WELL DATA: (continued) Date of Completion

260 ft. 8-22-79

☐ Cable tool	☒ Rotary	☐ Driven	☐ Dug
☐ Hollow rod	☐ Juted	☐ Bored	☐

USE: ☒ Domestic	☐ Public Supply	☐ Industry
☐ Irrigation	☐ Air Conditioning	☐ Commercial
☐ Test Well	☐	☐

5 CASING: Threaded ☒ Welded ☐ Weight: Above/Below

Diam. 4 in. to 206 ft. Depth

Weight 1.1 lbs./ft.

Drive Shoe? Yes ☒ No ☐

6 SCREEN:

Type: none

Dia.:

Slot/Gauge Length

Set between ft. and ft.

Fittings:

9 STATIC WATER LEVEL

60 ft. below land surface

10 PUMPING LEVEL below land surface

100 ft. after hrs. pumping

ft. after hrs. pumping

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Chlorides (Cl)

Hardness: Other

12 WELL HEAD COMPLETION:

☐ In Approved Pit☐ Pitless Adapter ☒ 12" Above Grade13 Well Grouted? ☒ Yes ☐ No☐ Neat Cement ☐ Bentonite ☒ 500

Depth: from ft. to 206 ft. p

14 Nearest Source of possible contamination

100 feet S Direction 28-40 Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

☐ Not Installed

Manufacturer's Name E-Z-Drill

Model Number 85041 5HP 220

Length of Drop Pipe 100 ft. capacity 1.1 G.P.M.

Type: ☒ Submersible☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

ADDED INFO BY DRILLER, ITEM #11

CORRECTED BY

ADDITION BY

ELEVATION

DEPTH TO ROCK

Elev ~ 1010

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

REGISTERED BUSINESS NAME REGISTRATION NO.

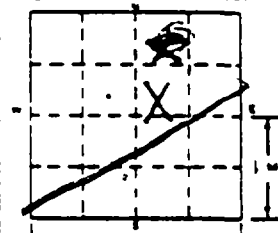
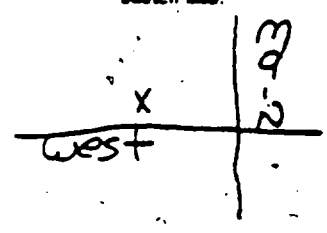
Address 1200 Ingham City Rd. Le. 000

Signed Date 10-23-79

AUTHORIZED REPRESENTATIVE

NOV 01 1974

WATER WELL RECORD
ACT 204 PA 1968MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		TOWNSHIP NAME		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
County		Tapeer		Section E 3 W		Town 9 N		Range 10 E	
Distance and Direction from Road Intersections		Township Name		Section Number		Town Number		Range Number	
40 North of West Rd. 1/4 mile west of Main St.		Hietamora		9		6 N		10 E	
Street address & City of Well Location		Locate with "X" in Section below		Sketch Map:		3 OWNER OF WELL:		4 WELL DEPTH: (completed) Date of Completion	
						Pilgrim Congregational Church		300 ft. 9/22/73	
						Address		5 USE: ☐ Domestic ☒ Public Supply ☐ Industry	
						58 West High Hietamora, Mich. 48455		☐ Irrigation ☐ Air Conditioning ☐ Commercial	
						6 CASING: Threaded ☒ Welded ☐ Height: Above/Below		7 SCREEN:	
						Surface 1 ft.		Type: _____ Dia.: _____	
						Weight 77 lbs./ft.		Size/Gauge _____ Length _____	
						Drive Shoe? yes ☒ no ☐		Set between _____ ft. and _____ ft.	
						8 STATIC WATER LEVEL		Fittings: _____	
						ft. below land surface		10 PUMPING LEVEL below land surface	
						300 ft. after 2 hrs. pumping 25 c.s.m.		ft. after _____ hrs. pumping _____ c.s.m.	
						11 WATER QUALITY in Parts Per Million:		12 WELL HEAD COMPLETION: ☐ In Approved Pit	
						Iron (Fe) _____ Chlorides (Cl) _____		☒ Pitless Adapter ☐ 12" Above Grade	
						Hardness _____ Other _____		13 Well Grouted? ☒ Yes ☐ No	
						14 Nearest Source of possible contamination		☐ Next Canon ☐ Sewerline ☐ _____	
						_____ feet _____ Direction _____ Type _____		Depth: From _____ ft. to _____ ft.	
						Well disinfected upon completion ☒ Yes ☐ No		15 PUMP: ☐ Not installed	
						16 Remarks, elevation, source of data, etc.		Manufacturer's Name Red Jacket	
						Ascertained by _____ Date 10/50		Model Number 120C HP 3/4" 220	
						ELEVATION _____		Length of Drop Pipe 210 ft. capacity 2 G.P.M.	
						DEPTH TO ROCK _____		Type: ☒ Submersible ☐ Jet ☐ Recirculating	
						17 WATER WELL CONTRACTOR'S CERTIFICATION:		Address 1527 Harrison Rd. Richmond, Mich.	
						This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.		Signed _____ Date 9/22/73	
						APPROVED BY _____		REGISTERED BUSINESS NAME _____	
						Address _____		Date _____	

GEOLOGICAL SURVEY COPY

WATER WELL RECORD
ACT 294 PA 1963MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

9-9

1 LOCATION OF WELL			2 FORMATION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	3 OWNER OF WELL:					
County	hapeen	Twp.	Metamora	Fraction	Village	SE 1/4 SW 1/4	Section No.	9	Town	6 N	Range	10 E
Name And Direction from Road Intersections				OWNER No.				3 OWNER OF WELL:				
W. of Oak St., 80' N. of High St.								Lowes Walker				
N. Oak St., Metamora, Mich.												
Street address & City of Well Location												
FORMATION				THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	7 CASING						
Gravel				70'	70'	Diam. Threaded ☐ Welded ☒ Height: Above/Below						
Clay				54'	124'	4 in. to 134 H. Depth surface _____ ft.						
Under bearing Sand + Gravel				14'	138'	Weight _____ lbs./ft.						
						Drive Shop? Yes ☒ No ☐						
						8 SCREEN						
						Type Stainless Steel Dia. 3"						
						Slot/Gauge 0.12 Length 4'						
						Set between 124 H. and 138 H.						
						Fittings: 3" x 18" nipple, Neoprene well packer						
						9 STATIC WATER LEVEL						
						50 H. below land surface						
						10 PUMPING LEVEL below land surface						
						110 H. after 6 hrs. pumping 65 g.p.m.						
						H. after _____ hrs. pumping _____ g.p.m.						
						11 WATER QUALITY in Parts Per Million:						
						Iron (Fe) _____ Chlorides (Cl) _____						
						Hardness _____						
						12 WELL HEAD COMPLETION: ☐ In Approved Pit						
						☒ Pitless Adapter ☐ 12" Above Grade						
						13 GROUTING						
						Well Grouted? ☐ Yes ☒ No						
						Material: ☐ Mortar Cement ☐ _____						
						Depth: From _____ ft. to _____ ft.						
						14 SANITARY						
						Nearest Source of possible contamination						
						60 feet NW Direction S 45° E Type						
						Well disinfected upon completion ☒ Yes ☐ No						
						15 PUMP: Not Installed						
						Manufacturer's Name _____						
						Model Number _____ H.P.						
						Length of Drop Pipe _____ ft. capacity _____ G.P.M.						
						Type: ☐ Submersible ☐ _____						
						☐ Jet ☐ Reel-pulling						
16 Remarks, elevation, source of data, etc.				17 WATER WELL CONTRACTOR'S CERTIFICATION								
** add by RD 12/2/66				This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.								
Elev. ~ 1040				Metamora Well Drilling								
				REGISTERED BUSINESS NAME								
				Address 2975 So Lapeen, Metamora, Mich								
				Signed Harry O. Kurckson 10-26-66								
				AUTHORIZED REPRESENTATIVE								

WATER WELL RECORD

ACT 204 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

9-10

1 LOCATION OF WELL		County <u>Lapeer</u>		Twp. <u>Matamoras</u>		Fraction <u>NE 1/4 NE 1/4</u>		Section No. <u>9</u>		Town <u>6</u> N. 10 E.		Range <u>10</u> E.	
2 FORMATION				THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		3 OWNER OF WELL:					
<u>Clay</u>				<u>55'</u>		<u>55'</u>		OWNER <u>Robert Walker</u>					
<u>Gravel</u>				<u>65'</u>		<u>120'</u>		4 WELL DEPTH: (completed) <u>250</u> ft. Date of Completion <u>10-26-68</u>					
<u>Fine Sand</u>				<u>125'</u>		<u>245'</u>		5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well					
<u>Sandstone</u>				<u>5'</u>		<u>250'</u>		6 CASING: Threaded ☒ Welded ☐ Height: Above/Below surface <u>1</u> ft. Weight <u>11</u> lbs./ft. Drive Shear? Yes ☒ No ☐					
								7 SCREEN: <u>NONE</u>					
								Type: _____ Dia.: _____					
								Size/Gauge: _____ Length: _____					
								Set between _____ ft. and _____ ft.					
								Fittings: _____					
								9 STATIC WATER LEVEL <u>50</u> ft. below land surface					
								10 PUMPING LEVEL below land surface <u>120</u> ft. after <u>4</u> hrs. pumping <u>40</u> g.p.m.					
								_____ ft. after _____ hrs. pumping _____ g.p.m.					
								11 WATER QUALITY in Parts Per Million:					
								Iron (Fe) _____ Chlorides (Cl) _____					
								Hardness _____					
								12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade					
								13 GROUTING: Well Grouted? ☒ Yes ☐ No					
								Material: ☐ Mortar Cement ☒ <u>Aggr. Gravel</u>					
								Depth: From <u>0</u> ft. to <u>245</u> ft.					
								14 SANITARY: Nearest Source of possible contamination <u>50</u> feet <u>E</u> Direction <u>Surface</u> Type _____					
								Well disinfected upon completion ☐ Yes ☒ No					
								15 PUMP: Manufacturer's Name <u>Red Jacket</u>					
								Model Number <u>50MHP10</u> H.P. <u>10</u>					
								Length of Drop Pipe <u>176</u> ft. capacity <u>10</u> G.P.M.					
								Type: ☒ Submersible ☐ Jet ☐ Reciprocating					
16 Remarks, elevation, source of data, etc.				17 WATER WELL CONTRACTOR'S CERTIFICATION:									
				This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.									
				Elev ~ 1042 <u>Matamoras Well Drilling</u> <u>0397</u>									
				REGISTERED BUSINESS NAME _____ REGISTRATION NO. _____									
				Address <u>3875 S Lapeer Matamoras</u>									
				Signed <u>Clinton F. Smith</u> Date <u>11-18-68</u>									
				AUTHORIZED REPRESENTATIVE									

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

9-11

1 LOCATION OF WELL		Twp.		Range	
County <u>Lapeer</u>		<u>Metamora</u>		<u>SE 1/4 SW 1/4 SE 1/4</u>	
Section No. <u>9</u>		Town <u>6</u>		Range <u>10</u>	
once And Direction from Road Intersections <u>on W side of Oak St. -</u> <u>1/2 mile N of High St.</u>		OWNER No. <u> </u>		3 OWNER OF WELL: <u>Delbert Lee</u>	
Street address & City of Well Location				Address <u> </u>	
2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	4 WELL		
<u>Red sand & clay</u>	<u>28'</u>	<u>28'</u>	<u>135</u> ft. <u>6-12-67</u>		
<u>Red gravel</u>	<u>30'</u>	<u>58'</u>	5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug		
<u>Blue clay</u>	<u>62'</u>	<u>120'</u>	☐ Hollow rod ☐ Jetted ☐ Bored ☐		
<u>Sugar sand</u>	<u>15'</u>	<u>135'</u>	6 USE: ☒ Domestic ☐ Public Supply ☐ Industry		
			☐ Irrigation ☐ Air Conditioning ☐ Commercial		
			☐ Test Well ☐		
			7 CASING: Threaded ☐ Welded ☒ Height: Above/Below		
			Diam. <u>4</u> in. to <u>131</u> ft. Depth <u> </u> ft.		
			Weight <u>1</u> lbs./ft. Drive Shoes? Yes ☒ No ☐		
			8 SCREEN:		
			Type: <u>Stainless</u> Dia.: <u>3"</u>		
			Slot <u> </u> Length <u>4'</u>		
			Set between <u>131</u> ft. and <u>135</u> ft.		
			Fittings: <u>Neoprene well packer</u>		
			<u>3" x 12" nipple</u>		
			9 STATIC WATER LEVEL		
			<u>50</u> ft. below land surface		
			10 PUMPING LEVEL below land surface		
			<u>60</u> ft. after <u>4</u> hrs. pumping <u>80</u> g.p.m.		
			<u> </u> ft. after <u> </u> hrs. pumping <u> </u> g.p.m.		
			11 WATER QUALITY in Parts Per Million:		
			Iron (Fe) <u> </u> Chlorides (Cl) <u> </u>		
			Hardness <u> </u>		
			12 WELL HEAD COMPLETION: ☐ In Approved Pit		
			☒ Pitless Adapter ☒ 12" Above Grade		
			13 GROUTING:		
			Well Grouted? ☐ Yes ☐ No		
			Material: ☐ Neat Cement ☐ <u> </u>		
			Depth: From <u> </u> ft. to <u> </u> ft.		
			14 SANITARY:		
			Nearest Source of possible contamination		
			<u>65</u> feet <u>W</u> Direction <u>Septic</u> Type		
			Well disinfected upon completion ☐ Yes ☒ No		
			15 PUMP:		
			Manufacturer's Name <u>Red Jacket</u>		
			Model Number <u>9MABA</u> HR <u>1</u>		
			Length of Drop Pipe <u>24</u> ft. capacity <u>15</u> G.P.M.		
			Type: ☒ Submersible ☐ <u> </u>		
			☐ Jet ☐ Reelprooting		
16 Remarks, elevation, source of data, etc.			17 WATER WELL CONTRACTOR'S CERTIFICATION:		
ADDED INFO. BY DRILLER, FROM <u> </u>			This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.		
CORRECTED BY: <u> </u>			<u>Metamora Well Drilling</u> <u>0397</u>		
ADDITION BY: <u> </u>			REGISTERED BUSINESS NAME REGISTRATION NO.		
			Address <u>3875 S. Lapeer Rd. Metamora</u>		
			Signed <u>Herbert D. Kurat</u> Date <u>10-31-67</u>		
			AUTHORIZED REPRESENTATIVE		

WATER WELL RECORD

ACT 204 PA 1966

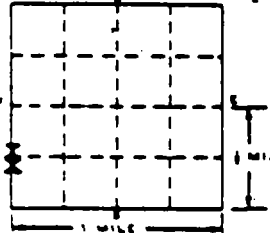
MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		TOWNSHIP NAME		FRACTION		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
County <u>Lapeer</u>		Township <u>Metamora</u>		NE 1/4 1/4 SE 1/4		9		6 N.W.		10 E.W.	
2 DISTANCE AND DIRECTION FROM ROAD INTERSECTIONS											
3/4 M. N. of Dryden Rd., 150 ft E of Metamora Rd.											
3 STREET ADDRESS & CITY OF WELL LOCATION											
Metamora Rd.											
4 WELL DEPTH: (completed) Date of Completion											
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig											
6 ☐ Hollow rod ☐ Jetted ☐ Bored											
7 USE: ☒ Domestic ☐ Public Supply ☐ Industry											
☐ Irrigation ☐ Air Conditioning ☐ Commercial											
☐ Test Well											
8 CASING: Threaded ☒ Welded ☐ Height: Above/Below											
Diam. Surface <u>1</u> ft.											
Weight <u>11.00</u> lbs./ft.											
9 ☐ 4 in. to <u>4</u> ft. Depth ☐ 12 in. to <u>4</u> ft. Depth											
Drive Shoe? Yes ☒ No ☐											
10 SCREEN:											
Type: <u>Johnson</u> Dia.: <u>4 inch</u>											
Star/Bolts <u>10</u> Length <u>4 feet</u>											
Set between <u>7 1/2</u> ft. and <u>50</u> ft.											
Fittings: <u>3 ft. 2 inch - 1 1/2 inch</u>											
<u>Threaded Plug Bottom</u>											
11 STATIC WATER LEVEL											
ft. below land surface											
12 PUMPING LEVEL below land surface											
ft. after <u> </u> hrs. pumping <u> </u> G.P.M.											
ft. after <u> </u> hrs. pumping <u> </u> G.P.M.											
13 WATER QUALITY in Parts Per Million:											
Iron (Fe) <u> </u> Chlorides (Cl) <u> </u>											
Hardness <u> </u> Other <u> </u>											
14 WELL HEAD COMPLETION: ☐ in Approved Pit											
☐ Pitless Adapter ☐ 12" Above Grade											
15 Well Grouted? ☒ Yes ☐ No											
☐ Seal Cement ☒ Bentonite ☐ <u> </u>											
Depth: From <u> </u> ft. to <u> </u> ft.											
16 Nearest Source of possible contamination											
ft. <u> </u> Direction <u> </u> Type <u> </u>											
Well disinfected upon completion ☐ Yes ☐ No											
17 PUMP: ☒ Not Installed											
Manufacturer's Name <u> </u>											
Model Number <u> </u> HP <u> </u> Vols <u> </u>											
Length of Drop Pipe <u> </u> ft. capacity <u> </u> G.P.M.											
Type: ☐ Submersible ☐ Jet ☐ Reel-mounted											
18 REMARKS, ELEVATION, SOURCE OF DATA, ETC.											
Elev. ~ 490											
19 WATER WELL CONTRACTOR'S CERTIFICATION:											
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.											
T. L. Gentry Well Driller 1190											
REGISTERED BUSINESS NAME REGISTRATION NO.											
Address <u>4095 W. Dodge Rd., Metamora, Mich</u>											
Signature <u>T. L. Gentry</u> Date <u>10-29-74</u>											
AUTHORIZED REPRESENTATIVE											

AUG 04 1975

WATER WELL RECORD
ACT 204 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

9-14

1 LOCATION OF WELL		Township Name		Fraction	Section Number	Town Number	Range Number
County Lapeer		Metamora		NW 1/4 SW 1/4 (SW)	9	6 N 1/2	10 E 1/2
Distance And Direction from Road Intersections M. E. of W-24 350' S. of Dryden Rd.				3 OWNER OF WELL: Frank Palmieri			
Street address & City of Well Location Dryden Rd., Metamora				Address [Redacted]			
Locate with "X" in section below 				4 WELL DEPTH: (completed) Date of Completion 280 ft. 7-8-75			
2 FORMATION				5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well			
				7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface 9 ft. Weight 11 lbs./ft. Drive Shoe? yes ☒ no ☐			
THICKNESS OF STRATUM				8 SCREEN:			
DEPTH TO BOTTOM OF STRATUM				Type: _____ Dia: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____			
Dry gravel				9 STATIC WATER LEVEL 80 ft. below land surface			
Clay				10 PUMPING LEVEL below land surface 105 ft. after 3 hrs. pumping 40 s.p.m.			
dry gravel				_____ ft. after _____ hrs. pumping _____ s.p.m.			
Clay & stones				11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____			
Clay				12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade			
Clay & gravel				13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ SDG Depth: From 0 ft. to 227 ft.			
Sandstone				14 Nearest Source of possible contamination none _____ feet _____ Direction _____ Type _____ Well disinfected upon completion ☒ yes ☐ no			
				15 PUMP: ☐ Not installed Manufacturer's Name Red Jacket Model Number R100 N1.15BC Amp 220 Length of Drop Pipe 105 ft. capacity 10 g.p.m. Type: ☒ Submersible ☐ Jet ☐ Rechargeable			
16 Remarks, elevation, source of data, etc. AUDED INFO BY DRILLER, ITEM NO. CORRECTED BY ADDITION BY G.M. ELA ~ 1075 ELEVATION DEPTH TO ROCK				17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora Well Drilling 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Inlay City Rd., Lapeer Signed Robert O. Kunk Date 7-11-75 AUTHORIZED REPRESENTATIVE			

D67d

100M (Rev. 12-68)

GEOLOGICAL SURVEY COPY



NORTHERN COMPANY
INCORPORATED

INDIANAPOLIS • MISHAWAKA • LANSING

9-15

☒ TEST

☐ PERMANENT

Job No. 133878

WELL LOG No. 74-B CITY METAMORA

County LAPER

Owner VILLAGE OF METAMORA

Township METAMORA

Section 9, T4N, R10E

Location

State MICHIGAN

From Land Description SE 1/4 NW 1/4 SE 1/4 SECTION 9

From Street or Road 715' W. OF S. H. DAK ST. (METAMORA RD.) & 400' S. N. OF HIGH ST. (DREYER RD.)

FORMATION FOUND - DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
topsoil	0	5	5	
sandy clay	5	15	10	
gravelly clay	15	20	5	
gravel & rocks	20	30	10	
gravel	30	35	5	
sand	35	90	55	
sandy gravel	90	100	10	
sandy clay	100	105	5	
gravelly clay	105	120	15	
gravelly clay & sandstone	120	130	10	
"packed" sand & gravel	130	160	30	67'-6 1/2"
clay	160	170	10	
stopped in clay @ 170'				
NOTE: This hole has been Electrical Logged				

ADDED INFO BY DRILLER ITEM NO.

*CORRECTED BY

*ADDITION BY

ELEVATION

DEPTH TO ROCK

Hole 4 1/2 "Dia Drilled by: { Cable Tool _____ Rotary X Jetting _____
Reverse Circ. _____ Bucket _____ Auger _____

Rotary Hole Grouted: Neat Cement _____ Drilling Mud B-3 Other _____

Casing 2 3/8 "OD From 24 "above ground to 152 feet below ground. Weight _____ Pounds per foot

Screen 1 1/2 " Set from 132 to 160 feet Make JOHNSON Type 33/WW Slot 2.5

Pumping test 1 GPM drawdown to _____ feet after 2 hours pumping

Date Completed FEBRUARY 1, 1974 Driller D. J. EGLESTON

0550

From H. W. Stark, PE



NORTHERN COMPANY

INCORPORATED

INDIANAPOLIS • MISHAWAKA • LANSING

9-16

☒ TEST☐ PERMANENT

Job No. 578

WELL LOG No. 74A CITY METAMORA County LAPE

Owner VILLAGE OF METAMORA Township METAMORA

Section 9, T. 4 N. R. 2 E.

Location State MICH

From Land Description SE 1/4 NW 1/4 SE 1/4 SECTION 9

From Street or Road 940' W. OF E. H. OAK ST. (METAMORA RD.) & 1400' S. OF HIGH ST. (DRYER RD.)

FORMATION FOUND - DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
topsoil	0	5	5	
sandy clay	5	15	10	
gravel & rocks	15	20	5	
gravel	20	30	10	
sand	30	70	40	
gravelly sand	70	75	5	
gravel	75	80	5	
clay	80	95	15	
gravel & rocks	95	100	5	
sand	100	110	10	
clay	110	115	5	
sandy clay	115	120	5	
sand	120	125	5	
sandy gravel	125	145	20	57'-3 1/2"
clay	145	160	15	
stopped in clay @ 160'				
Note: This hole has been Electrical Logged.				

ADDITIONAL INFO BY DRILLER: ITEM NO.

CORRECTED BY

ELEVATION BY

DEPTH TO ROCK

Hole 4 1/2" Dia Drilled by: { Cable Tool _____ Rotary ☒ Jetting _____
Reverse Circ. _____ Bucket _____ Auger _____

Rotary Hole Grouted: Neat Cement _____ Drilling Mud R-3 _____ Other _____

Casing 2 3/8" OD From 12" above ground to 12 1/2" feet below ground. Weight _____ Pounds per foot

Screen 1 1/2" Set from 13 1/2" to 14 1/2" feet Make JOHNSON Type 25/25W Slot 25

Pumping test 2 GPM drawdown to _____ feet after 7 hours pumping

Date Completed JANUARY 28, 1974 Driller D. J. EGGLESTON 0550



9-17

Job No. L32878

County LAPER

Township METAMORA

Section 9, T6N, R10E

State MICHIGAN

From Land Description SE 1/4 NW 1/4 SE 1/4 SECTION 9

From Street or Road 390' W. OF C. N. OAK ST. (METAMORA RD.) & 1400' N. OF HIGH ST. (DRYDEN RD)

Hole 8 "Dia Drilled by: { Cable Tool X Rotary _____ Jetting _____
Reverse Circ. _____ Bucket _____ Auger _____

Rotary Hole Grouted: Neat Cement _____ Drilling Mud _____ Other _____

Casing 8 3/8 "OD From 18 "above ground to 123.1 feet below ground. Weight 29.3 Pounds per foot

Screen 4 PS " Set from 119.8 to 139.8 feet Make JOHNSON Type SS/WW Slot .25

Pumping test 108 GPM drawdown to 120 1/2 feet after 24 hours pumping

Date Completed MARCH 12, 1974 Driller RAY STEADMAN 0550

WATER WELL RECORD
ACT 284 PA 1988

MICHIGAN DEPARTMENT OF PUBLIC HEALTH 10-1

1 LOCATION OF WELL		2 OWNERS OF WELL	
County Lapeer	Township Name Metamora	Fraction SW 1/2 SW 1/4	Section Number 10
		Town Number 6 N.E.	Range Number 10 E.K.
Place and Direction from Road Intersections 1/2 m. E of Oak St. 150' N. of Dryden Rd.		Address Timothy Brown 	
Street address & City of Well Location Dryden Rd., Metamora		4 WELL DEPTH: (completed) Date of Completion 400 ft. 6-20-74	
Locate with "X" in section below X		5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Janned ☐ Bored ☐	
Sketch Map: Oak St. 1/2 m. ← X 150' Dryden Rd.		6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐	
7 CASING: Threaded ☒ Welded ☐ Diam. 4 in. to 3 1/2 in. ft. Depth 342 1 1/2 in. to ft. Depth 400		Height: Above/Below Surface 1 ft. Weight 11 lbs./ft. Drive Shoe? Yes ☐ No ☒	
		8 SCREEN: Type: _____ Dia.: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____	
9 STATIC WATER LEVEL 200 ft. below land surface		10 PUMPING LEVEL below land surface 250 ft. after 1 hrs. pumping 30 g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.	
		11 WATER QUALITY in Parts Per Million: _____ Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____	
12 WELL HEAD COMPLETION: ☐ in Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade		13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Groutable ☒ SDC Depth: From 0 ft. to 0 ft.	
		14 Nearest Source of possible contamination 100 feet W Direction Septic Type Well grouted upon completion ☒ Yes ☐ No	
15 PUMP: ☐ Not installed Manufacturer's Name Red Jacket Model Number R75N1 12B0 3/4" size 220 Length of Drop Pipe 252 ft. capacity 100 g.p.m. Type: ☒ Submersible ☐ Jet ☐ Reciprocating		16 Remarks, elevation, source of data, etc. Elev. ~ 180	
		17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora Well Drilling 0392 REGISTERED BUSINESS NAME REGISTERED NO. Address 1200 Inlay City Rd., Lapeer Signed Ray H. Hark Date 6-26-74 LAP-24-15-REPRESENTATIVE	

WATER WELL RECORD
ACT 294 PA 1985MICHIGAN DEPARTMENT 10-2
OF
PUBLIC HEALTH

1 LOCATION OF WELL		County		Township Name		Fraction		Section Number		Town Number		Range Number	
Lapeer		Metamora		NE 1/4 NW 1/4 SE 1/4		10 kx		6 N 1/4		10		EX.	
Distance And Direction from Road Intersections													
1/4 M. W. of Gardner Rd.													
1/2 M. N. of Dryden Rd.													
Street Names & City of Well Location													
Locate with "X" in section below													
3 OWNER OF WELL: Norman Hughes													
Address: [REDACTED]													
4 WELL DEPTH: (corrected) Date of Completion													
440 ft. 7-22-74													
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig													
☐ Hollow rod ☐ Jetted ☐ Bored ☐													
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry													
☐ Irrigation ☐ Air Conditioning ☐ Commercial													
☐ Test Well ☐													
7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface													
4 in. to 341 ft. Depth Weight 11 lbs./ft.													
Drive Shoe Yes ☒ No ☐													
8 SCREEN: Type: Dia: 4 in. to 341 ft. Depth													
Set between ft. and ft. Fittings:													
9 STATIC WATER LEVEL 120 ft. below land surface													
10 PUMPING LEVEL below land surface													
200 ft. after 1 hrs. pumping 40 g.p.m.													
ft. after hrs. pumping g.p.m.													
11 WATER QUALITY IN PARTS PER MILLION: Iron (Fe) Chlorides (Cl) Hardness Other													
12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade													
13 Well Grouted? ☒ Yes ☐ No ☐ Next Cement ☐ Bentonite ☒ SDG													
Depth: From 0 ft. to 341 ft.													
14 Nearest Source of possible contamination none													
ft. Direction Type													
Well disinfected upon completion ☐ Yes ☐ No													
15 PUMP: ☐ Not installed													
Manufacturer's Name Red Jacket													
Model Number R75N1 12BC 3/4 inch 220													
Length of Drop Pipe 189. capacity 10 g.p.m.													
Type: ☒ Submersible ☐ Jet ☐ Reciprocating													
16 Remarks, elevation, source of data, etc.													
ADDED INFO BY DRILLER, ITEM NO.													
CORRECTED BY													
ELEVATION													
Elev ~ 1140													
17 WATER WELL CONTRACTOR'S CERTIFICATION:													
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.													
Metamora Well Drilling 0397													
REGISTERED BUSINESS NAME REGISTRATION NO.													
Address 1200 Inlay City Rd., Lapeer													
Signed Harry Allen Hurk Date 8-13-74													
AUTHORIZED REPRESENTATIVE													

JUN 03 1974

WATER WELL RECORD
ACT 204 PA 1965MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

10-3

1 LOCATION OF WELL		Township Name		Fraction	Section Number	Range Number
Lapeer		Metamora		SW SW SE	10	6 N 10 E
Distance And Direction from Road Intersections		3 OWNER OF WELL				
1/2 M. W. of Gardner Rd.		Ployd C. Pierce				
500' N. of Dryden Rd.		Address				
Street address & City of Well Location		Dryden Rd., Metamora				
Locality with "X" in Section below		4 WELL DEPTH: (Completed) Date of Completion				
		380 ft. 5-14-74				
Sketch Map:		5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig				
		☐ Hollow rod ☐ Juted ☐ Bored ☐				
		6 USE: ☒ Domestic ☐ Public Supply ☐ Industry				
		☐ Irrigation ☒ Air Conditioning ☐ Commercial				
		☐ Test Well ☐				
		7 CASING: Threaded ☒ Welded ☐ Height: Above/Surface				
		4 in. to 339 ft. Depth Surface 9 ft.				
		Weight 11 lbs./ft. Drive Shoe? Yes ☒ No ☐				
2 FORMATION		8 SCREEN:				
THICKNESS OF STRATUM		Type: _____ Dia: _____				
DEPTH TO BOTTOM OF STRATUM		Size/Gauge _____ Length _____				
Dry Gravel		Set between _____ ft. and _____ ft.				
Clay		Fittings: _____				
Sandstone		9 STATIC WATER LEVEL				
		180 ft. below land surface				
		10 PUMPING LEVEL below land surface				
		240 ft. after _____ hrs. pumping 30 S.G.M.				
		_____ ft. after _____ hrs. pumping _____ S.G.M.				
		11 WATER QUALITY in Parts Per Million:				
		Iron (Fe) _____ Chlorides (Cl) _____				
		Hardness _____ Other _____				
		12 WELL HEAD COMPLETION: ☐ In Approved Pit				
		☐ Pitless Adapter ☒ 12" Above Grade				
		13 Well Grouted? ☒ Yes ☐ No				
		☐ Neat Cement ☐ Bentonite ☒ SDG				
		Depth From 0 ft. to 339 ft.				
		14 Nearest Source of possible contamination none				
		_____ feet _____ Direction _____ Type				
		Well disinfected upon completion ☒ Yes ☐ No				
		15 PUMP: ☒ Not installed				
		Manufacturer's Name _____				
		Model Number _____ HP _____ Volts _____				
		Length of Drop Pipe _____ ft. capacity _____ G.P.M.				
		Type: ☐ Submersible				
		☐ Jet ☐ Reciprocating				
16 Remarks, elevation, source of gals, etc.		17 WATER WELL CONTRACTOR'S CERTIFICATION:				
REMARKS BY DRILLER: ELEV. ~ 1130 BOTTOM TO ROCK		This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora Well Drilling 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Inlay City Rd., Lapeer Signed <i>Ray Allen Kuntz</i> Date 5-21-74 AUTHORIZED REPRESENTATIVE				

MAY 02 1973

WATER WELL RECORD

ACT 284 2A 1966

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

10-4

1 LOCATION OF WELL

County

Lapeer

Township Name

Metamora

Fraction

SE SE SE

Section Number

10

Town Number

6

Range Number

10

E.W.

Distance And Direction from Road Intersections

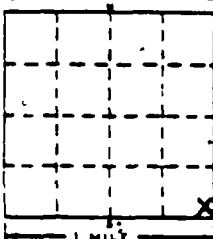
NW cor. of Lapeer Rd. & Dryden Rd.
400' N of Dryden Rd.

Street Address & City of Well Location

Dryden, Metamora

Loc. Me with "X" in section below

Sketch Map:



400'

X

Dryden

Metamora

2 FORMATION

THICKNESS
OF
STRATUMDEPTH TO
BOTTOM OF
STRATUM

Clay

25

25

Sand & Gravel

105

120

Clay

35

165

Sandy Clay

25

190

Clay

50

240

Gravel

13

253

3 OWNER OF WELL:

Lawrence Salt

Address [Redacted]

4 WELL DEPTH: (Completed) Date of Completion

253 ft.

4-19-73

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dip

☐ Hollow rod ☐ Jetted ☐ Bored ☐

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry

☐ Irrigation ☐ Air Conditioning ☐ Commercial

☐ Test Well ☐

7 CASING: Threaded ☒ Welded ☐ Height: Above Surface

4 in. to 249 ft. Depth

11 in. to ft. Depth

Drive Shoe? Yes ☒ No ☐

8 SCREEN:

Type: Stainless Dia: 3"

Slot/Screen: 0.25 Length: 2'

Set between 249 ft. and 253 ft.

Fittings: 3 x 1/8 in. nipple

1200 psi, 2200 psi

9 STATIC WATER LEVEL

120 ft. below land surface

10 PUMPING LEVEL below land surface

240 ft. after 8 hrs. pumping 55 g.p.m.

ft. after hrs. pumping g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Chlorides (Cl)

Hardness Other

12 WELL HEAD COMPLETION: ☐ In Approved Pit☒ Pitless Adapter ☒ 12" Above Grade13 Well: Grouted? ☒ Yes ☐ No☐ Neat Cement ☐ Bentonite

Depth: From 0 ft. to 249 ft.

14 Nearest Source of possible contamination

65 feet SW Direction Sept. C. Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

☐ No. installed

Manufacturer's Name Rad Jacket

Model Number 7511120 1/4 hp 220

Length of Drop Pipe 175 ft. capacity 12 G.P.M.

Type: ☒ Submersible ☐ Jet ☐ Recirculating

16 Remarks, elevation, source of data, etc.

ADDED INFO. BY DRILLER UEM no

Elev. ~ 7130

CORRECTED BY

ADDITION BY

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true

Metamora Well Drilling 0397

REGISTERED BUSINESS NAME Registration No.

Address 1640 Hemlock Metamora

Signed [Signature] Date 4/24/73

AUTHORIZED REPRESENTATIVE

SEP 05 1979

WATER WELL RECORD
ACT 204 PA 1905MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

10-5

1 LOCATION OF WELL		TOWNSHIP NAME		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
Lapeer		Metamora		10		6 N.W.		10 E.W.	
2 DISTANCE AND DIRECTION FROM ROAD INTERSECTIONS				3 OWNER OF WELL:					
1/2 M. E. of Metamora Rd. 1/2 M. S. of Stock Rd. Street address & City of Well Location: Woodside Trail Locate with "X" in section below				Address: [Redacted]					
				4 WELL DEPTH: 320 ft. Date of Completion: 8-15-79					
5 FORMATION Clay 70 70 Sand 25 95 Gravel & Clay 170 265 Sandstone 55 320				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well					
7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface 1 ft. Weight 11 lbs./ft. Drive Shoe? Yes ☒ No ☐				8 SCREEN: none Type: _____ Dia: _____ Size/Gauge: _____ Length: _____ Set between _____ ft. and _____ ft. Fittings: _____					
9 STATIC WATER LEVEL 120 ft. below land surface				10 PUMPING LEVEL below land surface 160 ft. other _____ hrs. pumping _____ G.P.M. _____ ft. other _____ hrs. pumping _____ G.P.M.					
11 WATER QUALITY IN Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____				12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade					
13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ Seal Depth: From 0 ft. to 264 ft.				14 Nearest Source of possible contamination _____ feet _____ Direction _____ Type _____ Well disinfected upon completion ☒ Yes ☐ No					
15 PUMP: ☒ Not installed Manufacturer's Name _____ Model Number _____ HP _____ Vols _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: ☐ Submersible ☐ Jet ☐ Recirculating				16 Remarks, elevation, source of data, etc.: ELEV. ~ 106'					
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Registered Business Name: _____ Registration No. 44-2337 Address: 1200 Imbry City, Mich 48869 Signature: _____ Date: 8-15-79 AUTHORIZED REPRESENTATIVE				18 ADDITIONAL INFORMATION: CORRECTED BY: CAM ADDITION BY: ELEVATION: MAP TO ROCK CO. (Rev. 12-68)					

WATER WELL RECORD

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

10-6

Country	Township Name	Section Q	Section Number	Town Number	Range Number
Canada	Metamora	10 NE 1/4	10	6 N 1/2	10 E 1/2

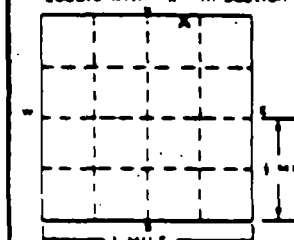
OWNER OF WILL: Michael Lathers

Address _____

Locate with "X" in section below

Stock Ed.

Harriet Lane



11/27/2018

Stack

$2 \frac{1}{4} m$

$\longleftrightarrow$
 $\frac{3}{4} m$

4 WELL DEPTH: (Completed) Date of Completion

340 5-21-80

5	☐ Cable tool	☒ Rotary	☐ Driven	☐ Dug
	☐ Hollow rod	☐ Jacked	☐ Bored	☐

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☐ ☐

CASING: Threaded ☒ Welded ☐ Height: Above/Below ☐

4 in. to 265 ft. Depth
1 in. to ft. Depth
Surface 1 ft.
Weight 11 lbs./ft.
Drive Shoe? yes ☒ no ☐

SCREEN: _____

Type: _____ Dia.: _____

Size/Gauge _____ Length _____

Set between _____ ft. and _____ ft.

Fittings:

9 STATIC WATER LEVEL
110 ft. below land surface

10. PUMPING LEVEL below land surface
150 ft. after 3 hrs. pumping 20 G.P.M.
 _____ ft. after _____ hrs. pumping _____ G.P.M.

11 WATER QUALITY in Parts Per Million: -----
Iron (Fe) _____ Chlorides (Cl) _____
Hardness _____ Other _____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade

Well Grouted? ☒ Yes ☐ No
☐ Most Cement ☐ Bentonite ☒ S-C
 Depth: From 0 ft. to 225 ft.

14 Nearest source of possible contamination none
_____ feet _____ Direction _____ Type _____
Well disinfected upon completion ☒ Yes ☐ No

18 PUMP: ☒ Not Installed

Manufacturer's Name _____

Model Number _____ HP _____ Volts _____

Length of Drop Pipe _____ ft. capacity _____ G.P.M.

Type: ☐ Submersible ☐ Jet ☐ Recirculating

16 Remarks, elevation, source of data, etc.

ADD: 1000 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100. 101. 102. 103. 104. 105. 106. 107. 108. 109. 110. 111. 112. 113. 114. 115. 116. 117. 118. 119. 120. 121. 122. 123. 124. 125. 126. 127. 128. 129. 130. 131. 132. 133. 134. 135. 136. 137. 138. 139. 140. 141. 142. 143. 144. 145. 146. 147. 148. 149. 150. 151. 152. 153. 154. 155. 156. 157. 158. 159. 160. 161. 162. 163. 164. 165. 166. 167. 168. 169. 170. 171. 172. 173. 174. 175. 176. 177. 178. 179. 180. 181. 182. 183. 184. 185. 186. 187. 188. 189. 190. 191. 192. 193. 194. 195. 196. 197. 198. 199. 200. 201. 202. 203. 204. 205. 206. 207. 208. 209. 210. 211. 212. 213. 214. 215. 216. 217. 218. 219. 220. 221. 222. 223. 224. 225. 226. 227. 228. 229. 230. 231. 232. 233. 234. 235. 236. 237. 238. 239. 240. 241. 242. 243. 244. 245. 246. 247. 248. 249. 250. 251. 252. 253. 254. 255. 256. 257. 258. 259. 260. 261. 262. 263. 264. 265. 266. 267. 268. 269. 270. 271. 272. 273. 274. 275. 276. 277. 278. 279. 280. 281. 282. 283. 284. 285. 286. 287. 288. 289. 290. 291. 292. 293. 294. 295. 296. 297. 298. 299. 300. 301. 302. 303. 304. 305. 306. 307. 308. 309. 310. 311. 312. 313. 314. 315. 316. 317. 318. 319. 320. 321. 322. 323. 324. 325. 326. 327. 328. 329. 330. 331. 332. 333. 334. 335. 336. 337. 338. 339. 340. 341. 342. 343. 344. 345. 346. 347. 348. 349. 350. 351. 352. 353. 354. 355. 356. 357. 358. 359. 360. 361. 362. 363. 364. 365. 366. 367. 368. 369. 370. 371. 372. 373. 374. 375. 376. 377. 378. 379. 380. 381. 382. 383. 384. 385. 386. 387. 388. 389. 390. 391. 392. 393. 394. 395. 396. 397. 398. 399. 400. 401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424. 425. 426. 427. 428. 429. 430. 431. 432. 433. 434. 435. 436. 437. 438. 439. 440. 441. 442. 443. 444. 445. 446. 447. 448. 449. 450. 451. 452. 453. 454. 455. 456. 457. 458. 459. 460. 461. 462. 463. 464. 465. 466. 467. 468. 469. 470. 471. 472. 473. 474. 475. 476. 477. 478. 479. 480. 481. 482. 483. 484. 485. 486. 487. 488. 489. 490. 491. 492. 493. 494. 495. 496. 497. 498. 499. 500. 501. 502. 503. 504. 505. 506. 507. 508. 509. 510. 511. 512. 513. 514. 515. 516. 517. 518. 519. 520. 521. 522. 523. 524. 525. 526. 527. 528. 529. 530. 531. 532. 533. 534. 535. 536. 537. 538. 539. 540. 541. 542. 543. 544. 545. 546. 547. 548. 549. 550. 551. 552. 553. 554. 555. 556. 557. 558. 559. 560. 561. 562. 563. 564. 565. 566. 567. 568. 569. 570. 571. 572. 573. 574. 575. 576. 577. 578. 579. 580. 581. 582. 583. 584. 585. 586. 587. 588. 589. 590. 591. 592. 593. 594. 595. 596. 597. 598. 599. 600. 601. 602. 603. 604. 605. 606. 607. 608. 609. 610. 611. 612. 613. 614. 615. 616. 617. 618. 619. 620. 621. 622. 623. 624. 625. 626. 627. 628. 629. 630. 631. 632. 633. 634. 635. 636. 637. 638. 639. 640. 641. 642. 643. 644. 645. 646. 647. 648. 649. 650. 651. 652. 653. 654. 655. 656. 657. 658. 659. 660. 661. 662. 663. 664. 665. 666. 667. 668. 669. 670. 671. 672. 673. 674. 675. 676. 677. 678. 679. 680. 681. 682. 683. 684. 685. 686. 687. 688. 689. 690. 691. 692. 693. 694. 695. 696. 697. 698. 699. 700. 701. 702. 703. 704. 705. 706. 707. 708. 709. 710. 711. 712. 713. 714. 715. 716. 717. 718. 719. 720. 721. 722. 723. 724. 725. 726. 727. 728. 729. 730. 731. 732. 733. 734. 735. 736. 737. 738. 739. 740. 741. 742. 743. 744. 745. 746. 747. 748. 749. 750. 751. 752. 753. 754. 755. 756. 757. 758. 759. 760. 761. 762. 763. 764. 765. 766. 767. 768. 769. 770. 771. 772. 773. 774. 775. 776. 777. 778. 779. 780. 781. 782. 783. 784. 785. 786. 787. 788. 789. 790. 791. 792. 793. 794. 795. 796. 797. 798. 799. 800. 801. 802. 803. 804. 805. 806. 807. 808. 809. 810. 811. 812. 813. 814. 815. 816. 817. 818. 819. 820. 821. 822. 823. 824. 825. 826. 827. 828. 829. 830. 831. 832. 833. 834. 835. 836. 837. 838. 839. 840. 841. 842.

• Don't CTF 40

7. ADDITION

UNCLASSIFIED

DEPT. TO BULK

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

REGISTERED BUSINESS NAME

NOTES

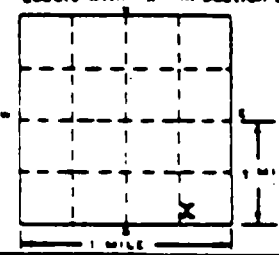
Address: 1200 Wiley Rd. N.E., Kansas

Signature _____ Date 5-23-00

APR 04 1979

WATER WELL RECORD
ACT 204 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

10-7

1 LOCATION OF WELL		2 FORMATION		3 OWNER OF WELL																			
County Lapeer	Township Name Metamora	Fraction SW 1/4 SE 1/4	Section Number 10	Town Number 6 NJS.	Range Number 10 E/R																		
Distance And Direction from Road Intersections 1/2 M. N. of Gardner Rd. 400' N. of Dryden Rd.		Address 																					
Street address & City of Well Location Dryden Rd.		4 WELL DEPTH: (Completed) Date of Completion 375 ft. 3-13-79																					
Locate with "X" in section below 		5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well																					
<table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th>FORMATION</th><th>THICKNESS OF STRATUM</th><th>DEPTH TO BOTTOM OF STRATUM</th></tr></thead><tbody><tr><td>Sand</td><td>20</td><td>20</td></tr><tr><td>Dry gravel</td><td>30</td><td>50</td></tr><tr><td>Clay & gravel</td><td>150</td><td>200</td></tr><tr><td>Clay</td><td>136</td><td>336</td></tr><tr><td>Sandstone</td><td>39</td><td>375</td></tr></tbody></table>		FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	Sand	20	20	Dry gravel	30	50	Clay & gravel	150	200	Clay	136	336	Sandstone	39	375	7 CASING: Threaded ☒ Welded ☐ Height: Above Surface 1 ft. Diam. 4 in. to 336 ft. Depth 11 lbs./ft. Drive Shoe? Yes ☒ No ☐			
		FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM																			
		Sand	20	20																			
		Dry gravel	30	50																			
		Clay & gravel	150	200																			
Clay	136	336																					
Sandstone	39	375																					
8 SCREEN: Type: _____ Dia.: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____																							
9 STATIC WATER LEVEL 180 ft. below land surface																							
10 PUMPING LEVEL below land surface 220 ft. after 2 hrs. pumping 30 g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.																							
11 WATER QUALITY in Parts Per Million: _____ Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____																							
12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Private Adapter ☒ 12" Above Grade																							
13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ SDG Depth: From 0 ft. to 336 ft.																							
14 Nearest Source of possible contamination 250 feet SE Direction Septic Type Well disinfected upon completion ☒ Yes ☐ No																							
15 PUMP: ☒ Not installed Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: ☐ Submersible ☐ Jet ☐ Reciprocating																							
16 Remarks: Well is in good condition. Elevation 1130.		17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Maxwell Kunk 3367 REGISTERED BUSINESS DRILLING REGISTRATION NO. Address 1200 Inlay City Rd., Lapeer Signed Maxwell Kunk Date 3-15-79 AUTHORIZED REPRESENTATIVE																					

WATER WELL RECORD
ACT 294 PA 1966MICHIGAN DEPARTMENT OF
PUBLIC HEALTH

1 LOCATION OF WELL		County <u>Lapeer</u>		Township Name <u>7 N. Tatarus</u>		Range Number <u>10 E. N. 10</u>	
Distance and Direction from Road Intersections <u>1/4 mi. S. of 7th Avenue Rd.</u> <u>1/2 mi. S. of 1st St.</u> <u>1/2 mi. S. of 1st St.</u>		Section Number <u>10</u>		Town Number <u>6 N. 10</u>		Range Number <u>10 E. 10</u>	
Street Address & City of Well Location <u>Michigan St. 4:45</u>		3 OWNER OF WELL: <u>Donald Butcher</u>		4 WELL DEPTH: (can)		5	
Locate with "X" in section below		Sketch Map:		6 USE: ☒ Domestic ☐ Public Supply ☐ Industry		7 CASING: Threaded ☒ Welded ☐ Height: Above/Below	
1 MILE		FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM	
Gravel		140		140		8 SCREEN:	
Clay		40		180		Type: _____ Dia.: _____	
Gravel		92		272		Slit/Gauge _____ Length _____	
Sandstone		48		320		Set between _____ ft. and _____ ft.	
						Fittings: _____	
						9 STATIC WATER LEVEL	
						130 ft. below land surface	
						10 PUMPING LEVEL below land surface	
						320 ft. after 1 hrs. pumping 25 g.p.m.	
						_____ ft. after _____ hrs. pumping _____ g.p.m.	
						11 WATER QUALITY in Parts Per Million:	
						Iron (Fe) _____ Chlorides (Cl) _____	
						Hardness _____ Other _____	
						12 WELL HEAD COMPLETION: ☐ In Approved Pit	
						☐ Pitless Adapter ☐ 12" Above Grade	
						13 Well Grouted? ☒ Yes ☐ No	
						☐ Neat Cement ☐ Bentonite ☐ _____	
						Depth: From 0 ft. to 272 ft.	
						14 Nearest Source of possible contamination	
						_____ feet _____ Direction _____ Type _____	
						Well disinfected upon completion ☒ Yes ☐ No	
						15 PUMP: ☒ Not Installed	
						Manufacturer's Name _____	
						Model Number _____ HP _____ Volts _____	
						Length of Drop Pipe _____ ft. capacity _____ G.P.M.	
						Type: ☐ Submersible	
						☐ Jet ☐ Rechargeable	
16 Remarks, elevation, source of data, etc.		17 WATER WELL CONTRACTOR'S CERTIFICATION:					
ADDED INFO BY DRILLER, ITEM NO.		This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.					
CORRECTED BY		<u>Lee Sharp</u>		0.214			
ELEVATION BY		REGISTERED BUSINESS NAME		REGISTRATION NO.			
ELEVATION		Address <u>4028 Fraser St. Lapeer, Mich.</u>					
DEPTH TO SURF		Signed <u>Lee Sharp</u>		Date <u>12-4-51</u>			

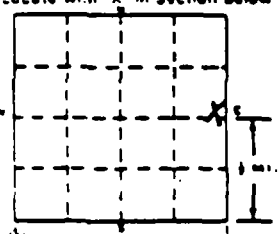
OCT 14 1981

WATER WELL AND PUMP RECORD

PART 127 ACT 368 P.A. 1978

PERMIT NUMBER

10-9

1 LOCATION OF WELL		TOWNSHIP NAME		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
COUNTY LAPPEER		METAMORA		SE 1/4 SE 1/4 116		10		6 N 2 10 E	
Distance And Direction From Road Intersection									
Street Address & City of Well Location									
Locate with 'X' in Section Below 									
2 FORMATION DESCRIPTION				THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	3 OWNER OF WELL			
sandy red clay				20	20	Address 			
sandy gravel				140	160	4 WELL DEPTH (completed) 360' Date of Completion 7/14/81			
clay & clayed gravel				50	310	5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Auger ☐ Jetted			
sandstone & sandy shale				50	360	6 USE ☐ Domestic ☐ Type I Public ☐ Type II Public ☐ Irrigation ☐ Type III Public ☒ Heat pump ☐ Test Well ☐ Type IV Public			
						7 CASING Diameter ☒ Steel ☒ Threaded Height Above/Below Surface 1 ft ☐ Plastic ☐ Welded Weight 11 lbs/ft 4-6 in to 315 ft depth in to _____ ft depth Ground Drill Hole Diameter 6 1/2 in to _____ ft depth in to _____ ft depth			
						8 SCREEN ☒ Not installed Type _____ Diameter _____ Slot/Gauge _____ Length _____ Set between _____ ft and _____ ft FITTINGS ☐ E-Packer ☐ Lead Packer ☐ Bromer Check ☐ Stone above screen _____ ft Other _____			
						9 STATIC WATER LEVEL 173 ft below land surface ☐ Flow			
						10 PUMPING LEVEL below land surface 360 ft after 2 hrs pumping at 37 1/2 GPM _____ ft after _____ hrs pumping at _____ GPM			
						11 WELL HEAD COMPLETION ☒ Press adapter ☐ 12" above grade ☐ Basement offset ☐ Approved pit			
						12 WELL GROUTED ☐ No ☒ Yes From 0 to 315 ft ☐ Neat cement ☒ Bentonite ☐ Other _____ No. of bags of cement _____ Additives _____			
						13 Nearest source of possible contamination Type septic Distance 75 Direction S Well disinfected upon completion? ☒ Yes ☐ No			
						14 PUMP ☐ Not installed ☐ Pump installation Only Manufacturer's name RED JACKET Model number 200TLM14CC 2 volts 220 Length of Drop Pipe 215 ft capacity 15 GPM TYPE ☒ Submersible ☐ Jet PRESSURE TANK Manufacturer's name Well X-Trol Model number 252 Capacity 22.5 Gallons			

USE A 2ND SHEET IF NEEDED

15 Remarks elevation source of data etc

Drilled By: Robert Wilcox

#44-1689

ADDED INFO BY DRILLER (SEE 15)

CORRECTED BY

16 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

JAMES C. WILCOX WELL DRILLING 44-0185

CERTIFIED BUSINESS NAME

REGISTRATION NO.

Address 4700 N. Lappeer Rd. Columbiaville, MI

Signed James C. Wilcox Date 7/15/81

AUTHORIZED REPRESENTATIVE

SEP 3 1975

WATER WELL RECORD
ACT 294 PA 1965MICHIGAN DEPARTMENT OF
PUBLIC HEALTH

1 LOCATION OF WELL

County

Lapeer

Township Name

Metamora

Fraction

NW 1/4 SE 1/4

Section Number

11

Town Number

6 N/E

Range Number

9 E/W

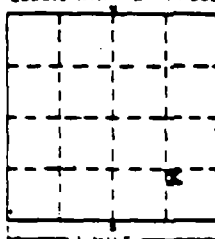
Distance and Direction from Road Intersections

M. N. of Dryden Rd.

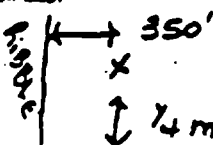
350' E. of Ribble Rd.

Street address & City of Well Location

Locate with "X" in section below



Sketch Map:



Dryden

3 OWNER OF WELL

Gene Jones

Address P. O. Box
Warren, Mich. 48090

4 WELL DEPTH: (calculated) Date of Completion

300 ft. 8-27-75

☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig
☐ Hollow rod ☐ Jetted ☐ Bored ☐

 6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well
7 CASING: Threaded ☒ Welded ☐ Height: Above/Below

4 in. to 236 ft. Depth Surface 1 ft.

Weight 11 lbs./ft.

Drive Shoe? Yes ☒ No ☐

8 SCREEN:

Type: _____ Dia.: _____

Slot/Groove _____ Length _____

Set between _____ ft. and _____ ft.

Fittings: _____

9 STATIC WATER LEVEL

120 ft. below land surface

10 PUMPING LEVEL below land surface

160 ft. after 3 hrs. pumping 80 g.p.m.

ft. after _____ hrs. pumping _____ g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) _____ Chlorides (Cl) _____

Hardness _____ Other _____

12 WELL HEAD COMPLETION:

☐ In Approved Pit☐ Pitless Adapter ☒ 12" Above Grade13 Well Grouted? ☒ Yes ☐ No☐ Neat Cement ☐ Bentonite ☒ SDG

Depth: From 0 ft. to 236 ft.

14 Nearest Source of possible contamination

none

_____ feet _____ Direction _____ Type _____

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

☒ Not installed

Manufacturer's Name _____

Model Number _____ HP _____ Volts _____

Length of Drive Pipe _____ ft. capacity _____ G.P.M.

Type: ☐ Submersible☐ Jet☐ Recirculating

16 Remarks, elevation, source of data, etc.

-USED INFO BY: DRILLER, ITEM NO.

CORRECTED BY

ADDITION BY

ELEVATION

DEPTH TO ROCK

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Metamora Well Drilling

0397

REGISTERED BUSINESS NAME

REGISTRATION NO.

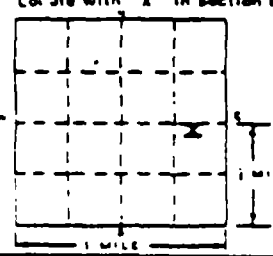
Address 1200 Inlay City Rd., Lapeer

Signed *Raymond D. Kersh* Date 8-28-75

AUTHORIZED REPRESENTATIVE

SED 07 1072

WATER WELL RECORD
ACT 294 PA 1988MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH 11-2

1 LOCATION OF WELL		Township (T34m)		Range Number		Section Number		Town Number		Range Number	
Lapeer		Metamora		NW 1/4 NE 1/4 SE 1/4		11		6 N 1/2		10 E 1/4	
Distance And Direction from Road Intersections 1/4 M. N of Dryden Rd. 500' E. of Ribble Rd. Street address & City of Well Location Locate with "X" in section below						3 OWNER OF WELL: Ronald Jones Address					
Sketch Map: 						4 WELL DEPTH: (completion Date of Completion) 300 ft. 7-31-73					
2 FORMATION						5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig					
						6 ☐ Mellow rod ☐ Jettied ☐ Bored ☐ _____					
THICKNESS OF STRATUM						7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface 1 ft.					
						8 SCREEN: Type: _____ Dia.: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____					
Gravel 80 80						9 STATIC WATER LEVEL 60 ft. below land surface					
Clay 150 230						10 PUMPING LEVEL below land surface 105 ft. after 1 hrs. pumping 50 g.p.m.					
Sandstone 70 300						11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____					
12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade						13 Well Grouted? ☒ Yes ☐ No					
						14 Nearest Source of possible contamination 70 feet NE Direction Septic Type					
15 PUMP: ☐ Not Installed Manufacturer's Name Red Jacket Model Number R50N1 9BC HP 1/2 Verts 220 Length of Drive Pipe 105 ft. capacity 220 g.p.m. Type: ☒ Submersible ☐ Jet ☐ Recirculating						16 Remarks, elevation, source of data, etc.					
						17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora Well Drilling 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Imley City Rd., Lapeer Signed [Signature] Date 8-3-73 AUTHORIZED REPRESENTATIVE					

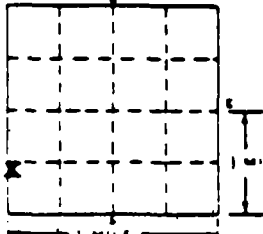
WATER WELL RECORD
ACT 294 PA 1965MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		County <u>Lapeer</u>		Twp. <u>Metamora</u>	Range <u>10</u>	Section No. <u>14</u>	Town <u>6</u>
Precinct <u>NE NE NW</u>		OWNER No. _____		3 OWNER OF WELL: <u>Louis Olajati</u>			
Street address & City of Well Location <u>Metamora Dayden Rd.</u>		Address _____		4 WELL DEPTH: (feet) <u>260</u> h. <u>192/14</u>			
2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐				
<u>Gravel</u>	<u>150'</u>	<u>150'</u>	7 CASING: Threaded ☐ Welded ☒ Height: Above <u>Surface</u> ft. <u>1</u> Weight <u>19.45</u> lbs./ft. Drive Shoe? Yes ☒ No ☐				
<u>clay</u>	<u>40'</u>	<u>190'</u>	8 SCREEN: <u>NON 2 - heavy gravel</u>				
<u>clay + gravel</u>	<u>55'</u>	<u>245'</u>	Type: _____ Dia.: _____				
<u>Water bearing gravel</u>	<u>15'</u>	<u>260'</u>	Size/Gauge: _____ Length: _____				
			Set between _____ ft. and _____ ft.				
			Fittings: _____				
			9 STATIC WATER LEVEL <u>150</u> ft. below land surface				
			10 PUMPING LEVEL below land surface <u>199</u> ft. after <u>12</u> hrs. pumping <u>50</u> g.p.m.				
			_____ ft. after _____ hrs. pumping _____ g.p.m.				
			11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____				
			12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade				
			13 GROUTING: Well Grouted? ☐ Yes ☐ No Material: ☐ Neat Cement ☐ _____ Depth: From _____ ft. to _____ ft.				
			14 SANITARY: Nearest Source of possible contamination <u>100</u> feet <u>E</u> Direction <u>Sydice</u> Type _____ Well disinfected upon completion ☐ Yes ☒ No				
			15 PUMP: Manufacturer's Name <u>Red Jacket</u> Model Number <u>100 MAFELB</u> HP <u>1/2</u> Length of Drop Pipe <u>187</u> ft. capacity <u>150</u> g.p.m. Type: ☒ Submersible ☐ Jet ☐ Rechargeable				
16 Remarks, elevation, source of data, etc.			17 WATER WELL CONTRACTOR'S CERTIFICATION:				
ADDED FIELD BY <u>PHOTO 11/18/68</u>			This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.				
CORRECTED BY: _____			<u>Metamora Well Drilling</u> <u>0397</u>				
PERMITTING BY: _____			REGISTERED BUSINESS NAME _____ REGISTRATION NO. _____				
			Address <u>3875 S. Lapeer Metamora</u>				
			Signed <u>Lawrence R. Hunt</u> Date <u>11-18-68</u>				
			AUTHORIZED REPRESENTATIVE				

SEP - 7 1976

WATER WELL RECORD
ACT 204 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

14-2

1 LOCATION OF WELL		TOWNSHIP NAME		Fraction	Section Number	Town Number	Range Number
County <u>Lapeer</u>		Township Name <u>Metamora</u>		Fraction <u>NE 1/4 SW 1/4</u>	Section Number <u>14</u>	Town Number <u>6 N.T.</u>	Range Number <u>10 E.T.</u>
Distance And Direction from Road Intersections <u>1/2 M. N of Hendrie Rd.,</u> <u>400' E. of Gardner Rd.</u>				3 OWNER OF WELL: <u>Donak W. Warden</u>			
Street address & City of Well Location <u>Gardner Rd., Metamora</u>				Address <u>[REDACTED]</u>			
Locate with "X" in section below				4 WELL DEPTH: (completed) Date of Completion <u>280</u> ft. <u>8-19-76</u>			
Search Map: 				5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ dug ☐ Hollow rod ☐ Janned ☐ Solid			
				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well			
				7 CASING: Threaded ☒ Welded ☐ Height: Above/Surface <u>1</u> ft. Diam. <u>4</u> in. to <u>258</u> ft. Depth <u>11</u> lbs./ft. Drive Shoe? Yes ☒ No ☐			
2 FORMATION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	8 SCREEN:			
<u>Clay</u>	<u>9</u>	<u>9</u>	Type: _____ Dia: _____				
<u>Dry Gravel</u>	<u>58</u>	<u>67</u>	Size/Gauge _____ Length _____				
<u>Clay & Gravel</u>	<u>63</u>	<u>130</u>	Set between _____ ft. and _____ ft.				
<u>Clay</u>	<u>128</u>	<u>258</u>	Fittings: _____				
<u>Sandstone</u>	<u>22</u>	<u>280</u>	9 STATIC WATER LEVEL <u>90</u> ft. below land surface				
			10 PUMPING LEVEL below land surface <u>130</u> ft. after <u>3</u> hrs. pumping <u>40</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.				
			11 WATER QUALITY in Parts Per Million: _____ Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____				
			12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade				
			13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ SDG Depth: From <u>0</u> ft. to <u>258</u> ft.				
			14 Nearest Source of possible contamination <u>150</u> feet <u>N</u> Direction <u>Septic</u> Type Well disinfected upon completion ☒ Yes ☐ No				
			15 PUMP: ☐ Not installed Manufacturer's Name <u>RED JACKET</u> Model Number <u>R75N1 12BC</u> HP <u>3/4</u> Watts <u>220</u> Length of Drop Pipe <u>126</u> ft. capacity <u>10</u> G.P.M. Type: ☒ Submersible ☐ Jet ☐ Reciprocating				
16 Remarks, elevation, source of data, etc.		17 WATER WELL CONTRACTOR'S CERTIFICATION:					
<u>Elev ~ 156</u>		This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.					
ADDED INFO BY DRILLER, ITEM NO.		<u>METAMORA WELL DRILLING</u> Registration No. <u>0307</u>					
CORRECTED BY		REGISTERED BUSINESS NAME					
ADDITION BY		Address: <u>1200 Inlay City Rd., Lapeer</u>					
ELEVATION		Signed <u>Walter J. Kunkel</u> Date <u>8-20-76</u>					
DEPTH TO ROCK		AUTHORIZED REPRESENTATIVE					

USE A 2ND SHEET IF NEEDED

NOV 05 1979

WATER WELL RECORD

ACT 284

PA 1906

MICHIGAN DEPARTMENT

PUBLIC HEALTH

1 LOCATION OF WELL		ACT 284		SECTION 14		TOWN 6 N/E		RANGE 18 W	
County	Township Name	Section Number	Town Number	Range Number					
Lapeer	Metamora	14	6 N/E	18 W					
Distance And Direction from Road Intersections					3 OWNER OF WELL:				
1/2 mi. S. of Dryden Rd.					Carol Sheldon				
2 mi. E. of Gardner Rd.					Address				
Street Address & City of Well Location Gardner Rd.									
Locate with "X" in section below					4 WELL DEPTH: 380 ft. 10-17-79				
					☐ Cable tool ☒ Rotary ☐ Driven ☐ dug				
					☐ Hollow rod ☐ Jotted ☐ Bored ☐				
					6 USE: ☒ Domestic ☐ Public Supply ☐ Industry				
					☐ Irrigation ☐ Air Conditioning ☐ Commercial				
					☐ Test Well ☐				
					7 CASING: Threaded ☒ Welded ☐ Height: Above/Below				
					Diam. 4 in. to 311 ft. Depth Surface 1 ft.				
					Weight 11 lbs./ft.				
					Drive Shaft? Yes ☒ No ☐				
2 FORMATION					8 SCREENS				
Clay & Gravel					Type: _____ Dia: _____				
Clay					Slot/Gauge _____ Length _____				
Sandstone					Set between _____ ft. and _____ ft.				
					Fittings: _____				
					9 STATIC WATER LEVEL				
					150 ft. below land surface				
					10 PUMPING LEVEL below land surface				
					220 ft. after 3 hrs. pumping 22 S.S.M.				
					_____ ft. after _____ hrs. pumping _____ S.S.M.				
					11 WATER QUALITY in Parts Per Million:				
					Iron (Fe) _____ Chlorides (Cl) _____				
					Hardness _____ Other _____				
					12 WELL HEAD COMPLETION: ☐ In Approved Pit				
					☐ Pitless Adapter ☒ 12" Above Grade				
					13 Well Grouted? ☒ Yes ☐ No				
					☐ Near Center ☐ Somewhat ☒ SDG				
					Depth: From 0 ft. to 311 ft.				
					14 Nearest Source of possible contamination				
					_____ feet _____ Direction _____ Type				
					Well disinfected upon completion ☒ Yes ☐ No				
					15 PUMP: ☒ Not installed				
					Manufacturer's Name _____				
					Model Number _____ HP _____ Volts _____				
					Length of Drop Pipe _____ ft. capacity _____ G.P.M.				
					Type: ☐ Submersible				
					☐ Jet ☐ Reciprocating				
16 Remarks, elevation, source of data, etc.					17 WATER WELL CONTRACTOR'S CERTIFICATION:				
ADDED INFO BY DRILLER: _____					This well was drilled under my jurisdiction and this report is true				
*CORRECTED BY _____					to the best of my knowledge and belief.				
**ADDITION BY _____					METAMORA WELL DRILLING 44-0387				
ELEVATION _____					REGISTERED BUSINESS NAME REGISTRATION NO.				
DATE _____					Address 1200 Inlay City Rd., Lapeer				
					Signed Master Kueck Date 10-11-79				

JAN 06 1981

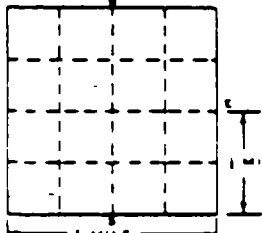
WATER WELL RECORD
ACT 284 PA 1268MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

144

1 LOCATION OF WELL		County		Township Name		Section Number		Range Number	
Lapeer		Metamora		NW 14		6 NCS.		10 E/W	
Distance And Direction from Road Intersections						3 OWNER OF WELL:			
1/2 W. E. of Garnder Rd. 1/2 W. S. of Dryden Rd. Street address & City of Well Location						Address R. E. Cross [Redacted]			
Locate with "X" in section below 						4 WELL DEPTH: (completed) Date of Completion 336 ft. 12-10-80			
2 FORMATION						5 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface 1 ft.			
THICKNESS OF STRATUM DEPTH TO BOTTOM OF STRATUM						6 SCREEN: Type: stainless Dia: 3" Slot/Gauge .015 Length 4' Set between 332 ft. and 336 ft. Fittings: 3x18 nipple neoprene packer			
Gravel						7 STATIC WATER LEVEL 150 ft. below land surface			
Clay & Gravel						8 PUMPING LEVEL below land surface 280 ft. after 3 hrs. pumping 15 g.p.m.			
Clay						9 WATER QUALITY in Parts Per Million: Iron (Fe) Chlorides (Cl) Hardness Other			
Clay & Gravel						10 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade			
Clay						11 Well Grouted? ☒ Yes ☐ No ☐ Seal Cement ☐ Bentonite ☒ SDC Depth: From 0 ft. to 332 ft.			
Sandstone						12 Nearest Source of possible contamination 100 feet N Direction septic Type Well disinfected upon completion ☒ Yes ☐ No			
Sandstone & Gravel						13 PUMP: ☒ Not installed Manufacturer's Name Model Number HP Volts Length of Drop Pipe ft. capacity G.P.M. Type: ☐ Submersible ☐ Jet ☐ Recirculating			
16 Remarks, elevation, source of data, etc. ADDED BY DRILLER, REV NO CORRECTED BY ADDITION BY G.M. ELEVATION DEPTH TO [unclear]						17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. MICHIGAN WELL DRILLING 44-0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Imple City Rd., Lapeer Signed [Signature] Date 12-11-80 AUTHORIZED REPRESENTATIVE			

JUL 16 1979

WATER WELL RECORD
ACT 294 PA 1985MICHIGAN DEPARTMENT OF
PUBLIC HEALTH

1 LOCATION OF WELL		2 FORMATION		3 OWNER OF WELL:	
County Lapeer	Township Name Metamora	Fraction ?	Section Number 14	Town Number 6 N's.	Range Number 10 W.
Distance And Direction from Road Intersections		Address Edward Homer			
Street address & City of Well Location Locate with "X" in section below		4 WELL DEPTH: (Completed) 238 ft. Date of Completion 2/22/78			
		5 ☐ Cable Tool ☒ Rotary ☐ Driven ☐ Dig			
		6 ☐ Hollow Rod ☐ Jetted ☐ Bored			
		6 USE: ☒ Domestic ☐ Public Supply ☐ Industry			
		☐ Irrigation ☐ Air Conditioning ☐ Commercial			
		7 CASING: Threaded ☒ Welded ☐ Height: Above 238 ft. Surface 1 ft.			
		8 ☐ 4 in. to 231 ft. Depth ☐ 11 lbs./ft. Drive Shoe? Yes ☒ No ☐			
		8 SCREEN: Type: Johnson Dia: 3"			
		Size/Gauge #25 Length 4'			
		Set between 234 ft. and 238 ft.			
		Fittings: 1, 3 1/2 ft. 3" Pipe			
		9 STATIC WATER LEVEL 2' ft. below land surface			
		10 PUMPING LEVEL below land surface 84 ft. after 1 hrs. pumping 25 g.p.m.			
		11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____			
		Hardness _____ Other _____			
		12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade			
		13 Well Grouted? ☒ Yes ☐ No			
		☐ Neat Cement ☒ Bentonite ☐ _____			
		Depth: From 0 ft. to 200 ft.			
		14 Nearest Source of possible contamination 75 feet W Direction Septic Tank Type _____			
		Well disinfected upon completion ☒ Yes ☐ No			
		15 PUMP: ☐ Not installed			
		Manufacturer's Name Rapidayton			
		Model Number 7EC210 HP 3/4 volts 220			
		Length of Drop Pipe 126 ft. 10 g.p.m.			
		Type: ☒ Submersible ☐ Jet ☐ Restoring			
16 Remarks, elevation, source of data, etc. ADDED INFO BY WRITER ITEM NO. *CORRECTED BY **ADDITION BY Cam ELEVATION DEPTH TO ROCK		17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Robert Coon Well Drilling Co. 0283 REGISTERED BUSINESS NAME REGISTRATION NO. Address 2265 Rollins St. Flint, Mich. 48507 Signed Robert Coon Date March 15, 78 CAPTURED REPRESENTATIVE			

FEB 13 1984 WATER WELL AND PUMP RECORD

PART 127 ACT 368 P.A. 1978

PERMIT NUMBER

14-6

1 LOCATION OF WELL		3 OWNER OF WELL	
County LAPPEER	Township Name METAMORA	Fraction NW 1/4 Sec 14 T6 N R10 E	Section Number 14
Distance And Direction From Road Intersection		Town Number 6 N/S	
Range Number 10 E/W		Address James Robert	
Street Address & City of Well Location		Address Same As Well Location? ☒ Yes ☐ No	
Locate with "A" in Section Below		4 WELL DEPTH (Completed) 357 ft	
Sketch Map		Date of Completion 8/25/83	
		5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug	
		☐ Hollow rod ☐ Auger ☐ Jetted ☐	
		6 USE ☒ Domestic ☐ Type I Public ☐ Type II Public	
		☐ Irrigation ☐ Type III Public ☒ Heat pump	
7 CASING		7 CASING	
☐ Steel ☐ Threaded		☐ Steel ☐ Threaded	
☒ Plastic ☐ Welded		☒ Plastic ☐ Welded	
Height Above/Below Surface 5 ft		Height Above/Below Surface 5 ft	
Weight 100 lb		Weight 100 lb	
Drive Shoe ☐ Yes ☒ No		Drive Shoe ☐ Yes ☒ No	
8 SCREEN		8 SCREEN	
☒ Not installed		☒ Not installed	
Type _____ Diameter _____		Type _____ Diameter _____	
Set/Gauge _____ Length _____		Set/Gauge _____ Length _____	
Set between _____ ft and _____ ft		Set between _____ ft and _____ ft	
FITTINGS: ☐ K-Packer ☐ Lead Packer ☐ Borehole Check		FITTINGS: ☐ K-Packer ☐ Lead Packer ☐ Borehole Check	
☐ Blank above screen		☐ Blank above screen	
9 STATIC WATER LEVEL		9 STATIC WATER LEVEL	
65 ft below land surface		65 ft below land surface	
☐ Flow		☐ Flow	
10 PUMPING LEVEL below land surface		10 PUMPING LEVEL below land surface	
357 ft other 1 1/2 hrs pumping at 60 GPM with 21		357 ft other 1 1/2 hrs pumping at 60 GPM with 21	
ft other hrs pumping at GPM		ft other hrs pumping at GPM	
11 WELL HEAD COMPLETION		11 WELL HEAD COMPLETION	
☒ Pressure adapter ☐ 12" above grade		☒ Pressure adapter ☐ 12" above grade	
☐ Basement offset ☐ Approved D-1		☐ Basement offset ☐ Approved D-1	
12 WELL GROUTED?		12 WELL GROUTED?	
☐ No ☒ Yes from 0 to 277 ft		☐ No ☒ Yes from 0 to 277 ft	
☐ Neat cement ☒ Bentonite ☐ Other		☐ Neat cement ☒ Bentonite ☐ Other	
No. of bags of cement _____ Address _____		No. of bags of cement _____ Address _____	
13 Nearest source of possible contamination		13 Nearest source of possible contamination	
Type septic Distance 140 Direction N		Type septic Distance 140 Direction N	
Well disconnected upon completion? ☒ Yes ☐ No		Well disconnected upon completion? ☒ Yes ☐ No	
14 PUMP		14 PUMP	
☐ Not installed ☐ Pump installation Only		☐ Not installed ☐ Pump installation Only	
Manufacturer's name Red Jacket		Manufacturer's name Red Jacket	
Model number 150CH1CN110C 1 1/2 volts 220		Model number 150CH1CN110C 1 1/2 volts 220	
Length of Drop Pipe 95 ft capacity 18 GPM		Length of Drop Pipe 95 ft capacity 18 GPM	
TYPE ☒ Submersible ☐ Jet		TYPE ☒ Submersible ☐ Jet	
PRESSURE TANK		PRESSURE TANK	
Manufacturer's name Well-Trol		Manufacturer's name Well-Trol	
Model number (2) 252 Capacity 22.5 Gallons		Model number (2) 252 Capacity 22.5 Gallons	

15 Remarks elevation source of data etc

Drilled By: Robert Wilcox
#44-1689

16 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my supervision and this report is true to the best of my knowledge and belief.

JAMES C. WILCOX WELL DRILLING 44-0185

Address **4700 E. Lapsee Rd. Columbusville, OH**

Signed **James C. Wilcox** Date **5/25/83**

AUTHORIZED REPRESENTATIVE

JUL 02 1981

WATER WELL RECORD

ACT 204 PA 1985

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

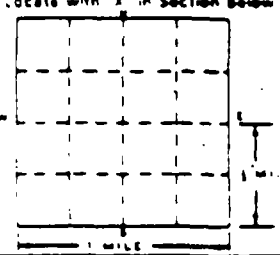
147

1 LOCATION OF WELL		County		Township Name		Fraction		Section Number		Town Number		Range Number	
Lapeer		Lapeer		Metamora		10 N 1/2 W 1/4		14		6 N 1/2		10 E 1/4	
Distance And Direction from Road Intersections						3 OWNER OF WELL							
1/2 mile S. of Gardner Rd.						Address [Redacted]							
Street address & City of Well Location						4 WELL DEPTH: (Completed) Date of Completion							
Locate with "X" in section below						300 ft. 4/3/81							
Sketch Map:						5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug							
						☐ Hollow rod ☐ Jotted ☐ Bored ☐							
						6 USE: ☒ Domestic ☐ Public Supply ☐ Industry							
						☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well							
						7 CASING: Threaded ☐ Welded ☐ Height: Above/Selow							
						4 in. to 6 in. Depth 246 ft. Surface 1 ft. Weight 12 lbs./ft. Drive Shoe? Yes ☒ No ☐							
2 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		8 SCREEN: NO							
sa ndy red clay		20		20		Type: _____ Dia: _____							
sa ndy gravel		30		50		Size/Gauge _____ Length _____							
sandy clayed gravel		10		60		Set between _____ ft. and _____ ft.							
cemented gravel		15		75		Fittings: _____							
clayed gravel		35		160		9 STATIC WATER LEVEL							
sticky clay		15		175		100-6 ft. below land surface							
clayed gravel & stones		57		232		10 PUMPING LEVEL below land surface							
sandy shale & sandstone mixed		60		300		300 ft. after 2 hrs. pumping 60 with air							
						_____ ft. after _____ hrs. pumping _____ S.P.M.							
						11 WATER QUALITY in Parts Per Million:							
						Iron (Fe) _____ Chlorides (Cl) _____							
						Hardness _____ Other _____							
						12 WELL HEAD COMPLETION: ☐ In Approved Pit							
						☒ Pitless Adapter ☐ 12" Above Grade							
						13 Well Grouted? ☒ Yes ☐ No							
						☐ Heat Cement ☐ Grout ☒ thick heavy mud							
						Depth: From 0 ft. to 100-6 ft.							
						14 Nearest Source of possible contamination							
						50 feet SE Direction septic Type							
						Well disinfected upon completion ☒ Yes ☐ No							
						15 PUMP: ☐ Not installed							
						Manufacturer's Name JACUZZI							
						Model Number 79431432 hp 3/4 vphs 220							
						Length of Drop Pipe 131 ft. capacity 10 G.P.M.							
						Type: ☒ Submersible ☐ Recirculating							
						☐ Jet ☐ Recirculating							
AUGED INFO BY DRILLER, ITAM MLL						16 WATER WELL CONTRACTOR'S CERTIFICATION:							
*CORRECTED BY						This well was drilled under my jurisdiction and this report is true							
**ADDITION BY						to the best of my knowledge and belief.							
ELEVATION						JUL 13 8 1981 JAMES C. WILCOX 44-0135							
DEPTH TO ROCK						REGISTERED BUSINESS NAME							
USE A 2ND SHEET IF NEEDED						REGISTRATION NO.							
16 Remarks, elevation, source of data, etc.						Address 4700 N. Lapeer Rd. Columbiaville, MI							
Drilled By: Robert Wilcox #44-1639						Signed James C. Wilcox Date 7/15/81							
						AUTHORIZED REPRESENTATIVE							

WATER WELL AND PUMP RECORD

PART 27 ACT 308 P.A. 1978

PERMIT NUMBER

LOCATION OF WELL		TOWNSHIP NAME		SECTION		TOWN NUMBER		RANGE NUMBER	
Lapeer		Metamora		1/4 1/4 1/4 1/4		6 N 5E		10 E 4N	
Distance and Direction from Road Intersection		Street Address & City of Well Location		OWNER OF WELL		Date of Completion			
1/2 mile South of Dryden Road; 600 ft East of Blood Road		Blood Road		Mr. & Mrs. Anderson		June 16, 1983			
Locate with 1/4 in Section Below		Sketch Map		WELL DEPTH (completed)		Date of Completion			
				130 ft		June 16, 1983			
FORMATION DESCRIPTION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		Casing Diameter		Height Above/Below Surface	
Clay & Stones		15		15		5 in 10 ft depth		1 ft	
Sand & gravel		115		130		5 in 10 ft depth		2.5 ft	
						Ground Hole Diameter		Drive Shoe	
						17 in 10 ft depth		Yes	
						17 in 10 ft depth		No	
						Type		Not Installed	
						Type Tingo		Diameter 5 inch	
						Size Gauge 18 foot		Length 10 feet	
						Set between 120 ft and 130 ft			
						FITTINGS		E-Packer Load Packer Brainer Check	
						Blank above screen		Other	
						STATIC WATER LEVEL		80 ft below land surface	
						PUMPING LEVEL		below land surface	
						11 ft after hrs pumping at 25 GPM			
						11 ft after hrs pumping at GPM			
						WELL HEAD COMPLETION		Pinless seeder 12' above grade	
						Basement offset		Approved oil	
						WELL GROUTED		No Yes From 0 to 120 ft	
						Neat cement Bentonite Other			
						No. of bags of cement		Additives	
						13 NEAREST SOURCE OF POSSIBLE CONTAMINATION		Type of installed device	
						Well protected upon completion?		Yes No	
						14 PUMP		Not installed Pump installation Only	
						Manufacturer's name		P & K	
						Model number		4P HP 1 VOLT 230	
						Length of Drop Pipe		100 ft Capacity 18 GPM	
						TYPE		Submersible Jet	
						PRESSURE TANK			
						Manufacturer's name		Petro	
						Model number		250 Capacity Gallons	
15 REMARKS		ELEVATION SOURCE OF DATA		16 WATER WELL CONTRACTOR'S CERTIFICATION		This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief			
ADDED INFO BY DRILLER, ITEM NO.		CORRECTED BY		Tri-County Drilling, Inc.		REGISTRATION NO.		1634	
ELEVATION BY		ELEVATION		Address		5754 East M-21		Corunna, MI	
				Signed		Date		6/17/83	

ACT 2M PA 10M

MICHIGAN DEPARTMENT OF PUBLIC HEALTH 15-1

2031

WATER WELL RECORD

ACT 294 PA 1963

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-2

1 LOCATION OF WELL

Country Lapeer Town Metamora Lot #10 Section No. 15 Town 6 Range 10 E.M.

Range And Direction from Road Intersections
3 ft. Center St (North)
1000 ft. E. of Blvd Rd.

OWNER No.

Street address & City of Well Location (No House Number) Center St. Metamora

3 OWNER OF WELL:

Falcon BuildersAddress 23468 Plum Hollow, Southfield, Mich.

2 FORMATION

THICKNESS
OF
STRATUMDEPTH TO
BOTTOM OF
STRATUMBrown Sand & gravel70'70'Blue clay85'155'Water bearing sand & gravel25'180'

4 WELL DEPTH: (completed) Date of Completion

180 ft.12-30-66

5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig
☐ Hollow rod ☐ Jammed ☐ Bored ☐

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☐

7 CASING: Threaded ☐ Welded ☒ Height: Above/Below
Dip. 4 in. to 17 1/2 ft. Depth surface 1 ft.
Weight 11 lbs./ft.
Drive Shoe? Yes ☒ No ☐

8 SCREEN:
Type Stainless Dia. 3"
Slot .015 Length 4'
Set between 17 1/2 ft. and 180 ft.

Finings: 3" x 18" nipple, Niagara well packer

9 STATIC WATER LEVEL
112 ft. below land surface

10 PUMPING LEVEL below land surface
147 ft. after 5 hrs. pumping 62 g.p.m.
_____ ft. after _____ hrs. pumping _____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) _____ Chlorides (Cl) _____
Hardness _____

12 WELL HEAD COMPLETION: ☐ In Approved Pit
☒ Pitless Adapter ☒ 12" Above Grade

13 GROUTING:
Well Grouted? ☐ Yes ☒ No
Material: ☐ Most Common ☐ _____
Depth: From _____ ft. to _____ ft.

14 SANITARY:
Nearest Source of possible contamination
50 feet E Direction Synthetic Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:
Manufacturer's Name Red Jacket
Model Number 9MAB5 HP 3/4
Length of Drop Pipe 147 ft. capacity 62 g.p.m.
Type: ☒ Submersible ☐ _____
☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

ADDED INFO. BY DRILLER, ITEM No.

CORRECTED BY:

REVISION NO. 316167

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true
to the best of my knowledge and belief.

Metamora Well Drilling
REGISTERED BUSINESS NAME

0397

REGISTRATION NO.

Address 3875 So. Lapeer Rd. MetamoraSigned Donald D. Kunk Date 2-25-67

AUTHORIZED REPRESENTATIVE

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

- ECJORDANCO

CHAIN OF CUSTODY RECORD

[illegible]

E. J. JORDAN CO.
 CONSULTING ENGINEERS
 302 CONGRESS STREET
 P. O. BOX 7050 D.T. STATION
 FORTLAND, MAINE 04112
 (207) 775-5401 TELEX 94-4329

REPORT OF ANALYSIS
 REFERENCE NUMBER 3128

DATE 9/25/85
 PAGE 1

STATE OF MICHIGAN
 RIGHT SERV SECT ATTORNEY GENERAL
 ENVIRON SERV DIV PO BOX 300
 LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
8	8/29/85		
5241017	ARSENIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	17-19
	CHROMIUM, SOLUBLE	MG/L	0.002-0.005
	CHROMIUM, HEXAVALENT	MG/L	0.002-0.005
	COPPER, SOLUBLE	MG/L	0.002-0.005
	IRON, SOLUBLE	MG/L	0.27-0.28
	LEAD, SOLUBLE	MG/L	0.020-0.030
	MAGNESIUM, SOLUBLE	MG/L	30-37
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.002-0.020
	POTASSIUM, SOLUBLE	MG/L	2.2-2.3
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	13-11
	ZINC, SOLUBLE	MG/L	0.04-0.049
	ALKALINITY, AS CaCO3	MG/L	300
	CHLORIDE	MG/L	24
	AMMONIA, AS N	MG/L	141
	NITROGEN, NITRATE, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.65
	SULFATE	MG/L	45-43
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	21
	PHENOLICS, TOTAL RECOVERABLE	UG/L	9.3
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	TRICHLOROETHYLENE	UG/L	22
	1,1,1-TRICHLOROETHANE	UG/L	3.4
	1,2-DICHLOROETHANE	UG/L	39
	TRANS-1,2-DICHLOROETHENE	UG/L	240
	TRICHLOROETHENE	UG/L	7.9
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D6	X	99
	P-BROMOFLUOROBENZENE	X	90
	1,2-DICHLOROETHANE-D4	X	100
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	DIETHYLPHTHALATE	UG/L	9.0
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	240
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-PERFLUOROMETHYLPHENOL	X	86
	BENZO(A)ANTHRACENE-D12	X	29
	DECAFLUOROBIPHENYL	X	112
180	8/29/85		
5241018	ARSENIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002

E. C. JOHNSON CO.
CONSULTING ENGINEERS
562 COLUMBIA STREET
P. O. BOX 7050 D.T. STATION
PORTLAND, ME 04112
(207) 775-5401 TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER 3128

DATE 9/25/85
PAGE 2

STATE OF MICHIGAN
NIGHT SERV SECT ATTN: C MENUSNE
ENVIRON SERV DIV PO BOX 30026
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
130	8/29/85		
5241018	CALCIUM, SOLUBLE	MG/L	20
	CHROMIUM, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.005
	COPPER, SOLUBLE	MG/L	0.011
	IRON, SOLUBLE	MG/L	0.35
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	5.3
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	3.8
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	75
	ZINC, SOLUBLE	MG/L	1.5
	ALKALINITY, AS CA ^{CO3}	MG/L	440
	CHLORIDE	MG/L	9.7
	AMMONIA, AS N	MG/L	1
	NITROGEN, KJELDAHL, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.49
	SULFATE	MG/L	46
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	0.3
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	15
	PHENOLICS, TOTAL RECOVERABLE	UG/L	18
	VOLATILE ORGANICS PRIORITY POLLUTANTS		ND
	VOLATILE ORGANICS		ND
	VOLATILE SURFACTANT RECOVERY		
	BENZENE-14	X	103
	P-BROMOFLUOROBENZENE	X	100
	1,2-DICHLOROETHANE-14	X	99
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		ND
	SEMI-VOLATILE SURFACTANT RECOVERY		
	2,4-DIFLUOROMETHYLPHENOL	X	69
	BENZD(A)ANTHRACENE-012	X	44
	DECAFLUOROBIPHENYL	X	71
4	8/29/85		
5241019	ARSENIC, SOLUBLE	MG/L	0.12
	CALCIUM, SOLUBLE	MG/L	0.005
	CALCIUM, SOLUBLE	MG/L	140
	CHROMIUM, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.005
	COPPER, SOLUBLE	MG/L	0.005
	IRON, SOLUBLE	MG/L	0.77
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	70

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CONSULTING ENGINEERS
562 CONGRESS STREET
P. O. BOX 7000 D.T. STATION
PORTLAND, OREGON 97208
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REPORT OF ANALYSIS
REFERENCE NUMBER 3128

DATE 7/25/85
PAGE 3

STATE OF MICHIGAN
MONT SERV SECT ATTN: MENDENHALL
ENVIRONMENTAL SERV DIV PO BOX 30028
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
4	8/29/85		
5241019	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.20
	POTASSIUM, SOLUBLE	MG/L	41
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	110
	ZINC, SOLUBLE	MG/L	4.2
	ALKALINITY, AS CaCO3	MG/L	1500
	CHLORIDE	MG/L	200-300
	AMMONIA, AS N	MG/L	3
	NITROGEN, NITRATE, TOTAL	MG/L	79-78
	TOTAL PHOSPHORUS, AS P	MG/L	0.35
	SULFATE	MG/L	2.8
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	1
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	1.0
	PHENOLICS, TOTAL RECOVERABLE	UG/L	1.5-15
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	BENZENE	UG/L	23
	METHYLENE CHLORIDE	UG/L	7.3
	TRANS-1,2-DICHLOROETHENE	UG/L	51
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D6	%	104
	P-BROMOFLUOROBENZENE	%	102
	1,2-DICHLOROETHANE-D4	%	106
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		16
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-FLUOROMETHYLPHENOL	%	77
	BENZ(A)ANTHRACENE-D12	%	33
	DECAFLUOROANTHRACENE	%	83
25	8/29/85		
5241020	ARSENIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	0.25
	CHROMIUM, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.005
	COPPER, SOLUBLE	MG/L	0.005
	IRON, SOLUBLE	MG/L	0.040
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	0.007
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	0.050
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	0.28

E. C. JOHNSON CO.
CONSULTING ENGINEERS
302 CUMMINGS STREET
P. O. BOX 7050 D.T. STATION
FURTLAND, PHOENIX 04112
(207) 775-5401 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER

3128

DATE 9/23/85
PAGE 4

STATE OF MICHIGAN
NIGHT SERV SECT ATTN: C. HENNING
ENVIRON SERV DIV PO BOX 30028
LANSING MI 48209

CLIENT	DATE RECEIVED /	UNITS	RESULTS
LAB ID	PARAMETER		
22	8/29/85		
5241020	ZINC, SOLUBLE	MG/L	0.001
	ALUMINUM, AS CaCO ₃	MG/L	20
	CHLORIDE	MG/L	1
	AMMONIA, AS N	MG/L	1
	NITROGEN, KELDIN, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.005
	SULFATE	MG/L	1.0
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	0.5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	0.005
	PHENOLICS, TOTAL RECOVERABLE	UG/L	0.005
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	VOLATILE ORGANICS		ND
	VOLATILE SURFACANT RECOVERY		
	BENZENE-D4	X	101
	P-BROMOPHTHALOGENE	X	101
	1,2-DICHLOROETHANE-D4	X	102
	SEMI-VOLATILE ORGANICS PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		ND
	SEMI-VOLATILE SURFACANT RECOVERY		
	2,4-DIFLUOROPHTHALIC ACID	X	101
	BENZ(a)ANTHRACENE-D12	X	101
	DECAFLUOROBIPHENYL	X	93
24	8/29/85		
5241021	ARGONIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	99
	CHROMIUM, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.005
	COPPER, SOLUBLE	MG/L	0.019
	IRON, SOLUBLE	MG/L	0.15
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	3
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	1.0
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	10
	ZINC, SOLUBLE	MG/L	0.048
	ALUMINUM, AS CaCO ₃	MG/L	370
	CHLORIDE	MG/L	12
	AMMONIA, AS N	MG/L	20
	NITROGEN, KELDIN, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.005
	SULFATE	MG/L	1.0

E. C. JORDAN CO.
CONSULTING ENGINEERS
562 CAMPBELL STREET
P. O. BOX 7050 D.F. STATION
PORTLAND, ORE 97208
(503) 775-5401 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER 3118

DATE 9/22/85
PAGE 5

STATE OF MICHIGAN
HEMT SERV SECT ATTNSIC REMOVENC
ENVIRON SERV DIV PO BOX 30028
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED PARAMETER	UNITS	RESULTS
24	8/29/85		
5241061	OIL & GREASE, TOTAL RECOVERABLE	MG/L	5
	TOTAL ORGANIC CARBON, SULFIDE	MG/L	24-25
	PHENOLICS, TOTAL RECOVERABLE	UG/L	6.4
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	TRICHLOROETHYLENE	UG/L	12-32
	1,1-DICHLOROETHYLENE	UG/L	16-19
	1,2-DICHLOROETHYLENE	UG/L	1-40
	TRANS-1,2-DICHLOROETHYLENE	UG/L	300-300
	TRICHLOROETHYLENE	UG/L	13-13
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D6	X	100-95
	P-BROMOFLUOROBENZENE	X	90-94
	1,2-DICHLOROETHYLENE-D4	X	111-105
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	DIETHYLPHTHALATE	UG/L	5.3
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	150
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-PERFLUOROMETHYLPHENOL	X	94
	BENZ(a)ANTHRACENE-012	X	44
	DECAFLUOROBIPHENYL	X	78

SIGNATURE

Richard A. Turner

REPORT TO STEPHEN A. TURNER
AUTHORIZATION 446591

BILLED SEP 28 1985
IN = 2032.75
O = 3652.50

EC JORDAN CO.

CONSULTING ENGINEERS
582 CONGRESS STREET / P.O. BOX 7080 • PORTLAND, MAINE 04112
(207) 775-8401 / TELEX: 94-4328

REPORT OF ANALYSIS

State of Michigan
ATTN: C. Menovska
Environ. Services Div.
Lansing, MI 48909

Samples Rec'd: 8/29/85
Data Reported: 9/25/85
Project No.: 4465-91
Lab No.: 5241017-021

SAMPLE IDENTIFICATION

PARAMETER	Client	#8	13D	4	25	24
	Lab	5241017	5241018	5241019	5241020	5241021

Carbonate	0.07	7.6	0.08	*	0.06
Bicarbonate	180	260	530	*	180

* pH data was not available

Results expressed in mg/l unless otherwise noted.

EC JORDAN CO.

Richard A. Rozema
Supervisor Richard A. Rozema

Supplemental Information

Sampling Site: As Noted

Sampled By: ECJ

Authorization: 4465-91

- Analytical Methods:
1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-79-020, U.S. Environmental Protection Agency, March 1978.
 2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 213, Dec. 3, 1978.
 3. Others as designated.

E.C. JORDAN CO.

CONSULTING ENGINEERS
342 CONGRESS STREET / P.O. BOX 7080 • PORTLAND, MAINE 04112
(207) 775-8401 / TELEX: 84-4329

REPORT OF ANALYSIS

State of Michigan
ATTN: C. Manovska
Environ. Services Div.
P.O. Box 30020
Lansing, MI 48909

Sample Rec'd: 8/29/85
Date Reported: 10/4/85
Project No.: 4465-91
Lab No.: 5241017 - 5241021

SAMPLE IDENTIFICATION

PARAMETER	Client	78	13D	4	25	24
	Lab	5241017	5241018	5241019	5241020	5241021

Antimony, mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005*
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* Duplicate analysis

Results expressed in mg/l unless otherwise noted.

E.C. JORDAN CO.

Richard A. Rozens
Supervisor Richard A. Rozens

Supplemental Information

Sampling Site: As Noted

Sampled By:

Authorization: ECJ 4465-91

- Analytical Methods:
1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-79-020, U.S. Environmental Protection Agency, March 1979.
 2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
 3. Others as designated.

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

— EC JORDAN CO.

E. C. JORDAN CO.
CONSULTING ENGINEERS
100 W. WASHINGTON STREET
P. O. BOX 1000 STATION
ANN ARBOR, MICH. 48102
(313) 761-1111 / TELEX 94-4129

REPORT OF ANALYSIS
REFERENCE NUMBER

3129

DATE 3/25/82
PAGE 1

STATE OF MICHIGAN
NORTH HAVEN, MICHIGAN
CANTON, OHIO 44705
LANSING, MI 48202

CLIENT	DATE RECEIVED		UNITS	RESULTS
LAP ID	PARAMETER			
44-3	8/2/80			
724034	ARSENIC, SOLUBLE	MG/L	(	0.005
	CADMIUM, SOLUBLE	MG/L	(	0.002
	COPPER, SOLUBLE	MG/L	(	74
	CHROMIUM, SOLUBLE	MG/L	(	0.005
	CHROMIUM, TOTAL	MG/L	(	0.005
	COPPER, SOLUBLE	MG/L	(	0.005
	IRON, SOLUBLE	MG/L	(	0.005
	LEAD, SOLUBLE	MG/L	(	0.025
	MANGANESE, SOLUBLE	MG/L	(	27
	MERCURY, SOLUBLE	UG/L	(	1.041.0
	NICKEL, SOLUBLE	MG/L	(	0.020
	PERMANGANATE, SOLUBLE	MG/L	(	1.0
	SILICA, SOLUBLE	MG/L	(	0.005
	SILICA, TOTAL	MG/L	(	4.8
	SILICA, TOTAL	MG/L	(	7.39
	SILICA, TOTAL, AS FACTS	MG/L	(	750-770
	SILICA, TOTAL	MG/L	(	14
	SILICA, AS P	MG/L	(	1
	SILICA, TOTAL, AS P	MG/L	(	1
	TOTAL PHOSPHORUS, AS P	MG/L	(	0.00
	SILICA	MG/L	(	39
	SILICA, TOTAL, RECOVERABLE	MG/L	(	3
	SILICA, TOTAL, RECOVERABLE	MG/L	(	18
	SILICA, TOTAL, RECOVERABLE	MG/L	(	3
	VOLATILE ORGANICS PRIORITY POLLUTANTS			
	VOLATILE ORGANICS			10
	VOLATILE ORGANICS RECOVERY			
	PERMETHYLENE	X		77
	PERMETHYLENE	X		92
	PERMETHYLENE-04	X		24
	SEMI-VOLATILE ORGANICS PRIORITY POLLUTANTS			
	SEMI-VOLATILE ORGANICS			10
	SEMI-VOLATILE ORGANICS RECOVERY			
	PERMETHYLENE	X		102
	PERMETHYLENE-012	X		68
	PERMETHYLENE	X		23
44-3	8/2/80			
724035	ARSENIC, SOLUBLE	MG/L	(	0.005
	CADMIUM, SOLUBLE	MG/L	(	0.002
	COPPER, SOLUBLE	MG/L	(	0.27
	CHROMIUM, SOLUBLE	MG/L	(	0.005
	CHROMIUM, TOTAL	MG/L	(	0.005
	COPPER, SOLUBLE	MG/L	(	0.005
	IRON, SOLUBLE	MG/L	(	0.005
	LEAD, SOLUBLE	MG/L	(	0.025

E. S. JORDAN CO.
CONSULTING ENGINEERS
262 CONGRESS STREET
P. O. BOX 7020 D.T. STATION
MILWAUKEE, WIS. 53112
(207) 775-5401 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER

3129

DATE 9/25/85
PAGE 2

STATE OF MICHIGAN
NIGHT SERV. SECT ATTN: C. HENDON
ENVIRONMENTAL SERV. DIV. PO BOX 30028
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
9-26 5242035	8/30/85 LEAD, SOLUBLE	MG/L	0.024
	MAGNESIUM, SOLUBLE	MG/L	0.042
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	0.071
	SELENIUM, SOLUBLE	MG/L	0.003
	SODIUM, SOLUBLE	MG/L	0.24
	ZINC, SOLUBLE	MG/L	0.042
	ALKALINITY, AS CaCO3	MG/L	20
	CHLORIDE	MG/L	1
	AMMONIA, AS N	MG/L	1
	NITROGEN, K. SOLUBLE, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.05
	SULFATE	MG/L	1.3
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	5
	PHENOLICS, TOTAL RECOVERABLE	UG/L	0.5
	VOLATILE ORGANICS PRIORITY POLLUTANTS		ND
	VOLATILE SUBSTRATE RECOVERY		ND
	BENZENE-D6	X	98
	P-BROMOFLOUOROBENZENE	X	86
	1,2-DICHLOROETHANE-D4	X	93
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		ND
	SEMI-VOLATILE SUBSTRATE RECOVERY		ND
	2-FLUORODIMETHYLPHENYL	X	52-100
	BENZ(A)ANTHRACENE-D12	X	105-72
	DECAFLORODIPHENYL	X	28-82
9-26 5242036	8/30/85 ARSENIC, SOLUBLE	MG/L	0.002
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	18
	CHROMIUM, SOLUBLE	MG/L	0.003
	CHROMIUM, HEXAVALENT	MG/L	0.003
	COPPER, SOLUBLE	MG/L	0.003
	IRON, SOLUBLE	MG/L	0.023
	LEAD, SOLUBLE	MG/L	0.030
	MAGNESIUM, SOLUBLE	MG/L	11
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	3.6
	SELENIUM, SOLUBLE	MG/L	0.003
	SODIUM, SOLUBLE	MG/L	3.5

E. C. JORDAN CO.
CONSULTING ENGINEERS
565 WINDMILL STREET
P. O. BOX 1050 T. SIMTOM
PORTLAND, MAINE 04112
(207) 775-5400 TELE 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER

3129

DATE 7/25/05
PAGE 3

STATE OF MICHIGAN
NIGHT SERV SECT ATTORNEY GENERAL
ENVIRON SERV DIV PO BOX 30026
LANSING MI 48909

CLIENT	DATE RECEIVED	PARAMETER	UNITS	RESULTS
LAB ID				
Mr-1	8/30/05			
5242036		ZINC, SOLUBLE	MG/L	2.0
		ALCALINITY, AS CaCO3	MG/L	1300
		CHLORIDE	MG/L	21
		AMMONIA, AS N	MG/L	1
		NITROGEN, NITRATE, TOTAL	MG/L	1.3
		TOTAL PHOSPHORUS, AS P	MG/L	1.2
		SULFATE	MG/L	38
		OIL & GREASE, TOTAL RECOVERABLE	MG/L	1
		TOTAL ORGANIC CARBON, SOLUBLE	MG/L	14-13
		PHENOLICS, TOTAL RECOVERABLE	MG/L	5.7
		VOLATILE ORGANICS PRIORITY POLLUTANTS		
		VOLATILE ORGANICS		ND
		VOLATILE SURROGATE RECOVERY	%	
		BENZENE-1H	%	82
		P-BROMOFLUOROBENZENE	%	98
		1,2-DICHLOROETHANE-1H	%	94
		SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
		SEMI-VOLATILE ORGANICS		ND
		SEMI-VOLATILE SURROGATE RECOVERY	%	
		2-FLUOROPHENYLPHENOL	%	76
		BENZO(A)ANTHRACENE-1H	%	100
		DECAFLUOROBIPHENYL	%	56

SIGNATURE

Stephen A. Turner

REPORT TO
AUTHORIZATION

STEPHEN A. TURNER
446591

E.C. JORDAN CO.

CONSULTING ENGINEERS
562 CONGRESS STREET / P.O. BOX 7060 • PORTLAND, MAINE 04112
(207) 775-6401 / TELEX: 94-4328

REPORT OF ANALYSIS

STATE of MICHIGAN
ATTN: C. Menovska
Environ. Services Div.
P.O. Box 30020
LANSING, MI 48905

Samples Rec'd: 8/30/85
Data Reported: 9/25/85
Project No.: 4465-91
Lab No.: 5242034-36

PARAMETER	SAMPLE IDENTIFICATION		
	Client	MW-3 108	MW-1 26 6-1
	Lab	5242034	5242035

Carbonate, mg/l	0.49 / 0.50	- *	0.30
Bicarbonate	420 / 430	-	640

* field pH DATA NOT AVAILABLE

Results expressed in mg/l unless otherwise noted.

E.C. JORDAN CO.

Supervisor

R. Rozen

Supplemental Information

Sampling Site: AS NOTED

Sampled By: E.C.J.

Authorization: 4465-91

- Analytical Methods:
1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-78-020, U.S. Environmental Protection Agency, March 1978.
 2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
 3. Others as designated.

EC JORDAN CO.

CONSULTING ENGINEERS
362 CONGRESS STREET / P.O. BOX 7080 • PORTLAND, MAINE 04112
(207) 778-6401 / TELEX: 94-4328

REPORT OF ANALYSIS

State of Michigan
ATTN: C. Manovska
Environ. Services Div.
P.O. Box 30020
Lansing, MI 48909

Samples Rec'd: 8/30/85
Data Reported: 10/4/85
Project No.: 4465-91
Lab No.: 5242034 - 5242036

SAMPLE IDENTIFICATION

PARAMETER	Client	#3	#26	#1
	Lab	5242034	5242035	5242036

Antimony, mg/l	<0.005	<0.005	<0.005
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Results expressed in mg/l unless otherwise noted.

EC JORDAN CO.


Supervisor Richard A. Rozema

Supplemental Information

Sampling Site: As Noted
Sampled By: ECJ
Authorization: 4465-91

Analytical Methods:

1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-79-020, U.S. Environmental Protection Agency, March 1979.
2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
3. Others as designated.

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

CHAIN OF CUSTODY RECORD

[illegible]

Table 1. Results of quality control measurements for selected aquatic parameters.

Parameter	Date of Analysis	Measured Value (mg/l)	EPA Reference Standard	
			True Value (mg/l)	Acceptance Range ¹ (mg/l)
Alkalinity	9/04/85	33.9	34.4	31.1 - 37.7
	9/05/85	34.3	34.4	31.1 - 37.7
Ammonia	9/09/85	1.46	1.52	1.34 - 1.70
	9/11/85	1.45	1.52	1.34 - 1.70
	9/19/85	1.57	1.52	1.34 - 1.70
Chloride	9/10/85	79.8	80.8	75.5 - 86.3
Oil and Grease	9/05/85	19.1	20.0	15.4 - 22.8
	9/10/85	21.0	20.0	15.4 - 22.8
Phenolics (in ug/l)	9/14/85	34.7	36.0	NA ²
	9/16/85	33.6	36.0	NA
	9/18/85	34.3	36.0	NA
	9/19/85	34.3	36.0	NA
Sulfate	9/09/85	88.9	95.3	83.5 - 103.3
Total Kjeldahl Nitrogen	9/12/85	4.55	4.78	4.32 - 5.44
	9/24/85	4.41	4.78	4.32 - 5.44
	9/24/85	4.62	4.78	4.32 - 5.44
Total Organic Carbon	9/12/85	58.8	61.3	49.2 - 72.0
	9/12/85	59.3	61.3	49.2 - 72.0
	9/12/85	58.8	61.3	49.2 - 72.0
	9/12/85	58.4	61.3	49.2 - 72.0
	9/12/85	59.8	61.3	49.2 - 72.0
Total Phosphorus	9/06/85	0.99	1.03	0.94 - 1.18
	9/11/85	0.97	1.03	0.94 - 1.18

¹ Corresponds to the reported 95% confidence interval of the standard's true value.

² NA - Not available for this EPA Reference Standard.

Table 2. Results of quality control measurements for selected elements.

Parameter	Date of Analysis	Measured Value (mg/l)	EPA Reference Standard	
			True Value (mg/l)	Acceptance Range ¹ (mg/l)
Antimony		NC ²	0.102	0.082 - 0.122
Arsenic	9/13/85	0.025	0.027	0.022 - 0.032
	9/13/85	0.024	0.027	0.022 - 0.032
	9/13/85	0.023	0.027	0.022 - 0.032
Cadmium	9/05/85	0.030	0.037	0.030 - 0.044
	9/05/85	0.035	0.037	0.030 - 0.044
	9/05/85	0.032	0.037	0.030 - 0.044
Calcium	9/17/85	7.24	7.50	6.00 - 9.00
	9/17/85	7.20	7.50	6.00 - 9.00
	9/17/85	6.90	7.50	6.00 - 9.00
Chromium	9/18/85	0.248	0.258	0.206 - 0.310
	9/18/85	0.220	0.258	0.206 - 0.310
	9/18/85	0.250	0.258	0.206 - 0.310
Copper	9/09/85	0.290	0.335	0.268 - 0.402
	9/09/85	0.330	0.335	0.268 - 0.402
	9/09/85	0.300	0.335	0.268 - 0.402
Iron	9/06/85	0.814	0.789	0.631 - 0.947
	9/06/85	0.780	0.789	0.631 - 0.947
	9/06/85	0.730	0.789	0.631 - 0.947
Lead	8/30/85	0.358	0.430	0.344 - 0.516
	8/30/85	0.350	0.430	0.344 - 0.516
	8/30/85	0.410	0.430	0.344 - 0.516
Magnesium	9/16/85	0.486	0.500	0.400 - 0.600
	9/16/85	0.470	0.500	0.400 - 0.600
	9/16/85	0.450	0.500	0.400 - 0.600
Mercury	9/11/85	0.313	0.300	0.240 - 0.360
	9/11/85	0.251	0.300	0.240 - 0.360
	9/11/85	0.244	0.300	0.240 - 0.360
Nickel	9/05/85	0.178	0.206	0.165 - 0.247
	9/05/85	0.200	0.206	0.165 - 0.247
	9/05/85	0.180	0.206	0.165 - 0.247

Table 2. (continued)

Parameter	Date of Analysis	Measured Value (mg/l)	EPA Reference Standard	
			True Value (mg/l)	Acceptance Range ¹ (mg/l)
Potassium	9/10/85	1.57	1.50	1.20 - 1.80
	9/10/85	1.30	1.50	1.20 - 1.80
	9/10/85	1.20	1.50	1.20 - 1.80
Selenium	9/11/85	0.010	0.010	0.008- 0.012
	9/11/85	0.009	0.010	0.008- 0.012
	9/11/85	0.010	0.010	0.008- 0.012
Sodium	9/10/85	1.61	1.50	1.20 - 1.80
	9/10/85	1.30	1.50	1.20 - 1.80
	9/10/85	1.30	1.50	1.20 - 1.80
Zinc	9/09/85	0.358	0.415	0.332- 0.498
	9/09/85	0.390	0.415	0.332- 0.498
	9/09/85	0.390	0.415	0.332- 0.498

¹ Corresponds to 80 - 120% recovery of the standard after being processed through the entire analytical procedure.

² Not completed due to lamp failure. New lamp obtained, analyses underway, and expect to forward results during week of October 7.

E.C. JORDAN CO.

CONSULTING ENGINEERS
562 CONGRESS STREET / P.O. BOX 7060 • PORTLAND, MAINE 04112
(207) 776-6401 / TELEX: 84-4328

REPORT OF ANALYSIS

State of Michigan
ATTN: C. Menovska
Environ. Services Div.
P.O. Box 30020
Lansing, MI 48909

Samples Rec'd:
Date Reported: 10/04/85
Project No.: 4465-91
Lab No.:

SAMPLE IDENTIFICATION

PARAMETER Client

Lab

Quality Control Measurements

Parameter	Date of Analysis	Measured Value (mg/l)	EPA Reference Standard	
			True Value (mg/l)	Acceptable Range (mg/l)
<u>Antimony</u>	09-25-85	0.093	0.097	0.078 - 0.116
	09-25-85	0.114	0.097	0.078 - 0.116
	09-26-85	0.086	0.097	0.078 - 0.116

Results expressed in mg/l unless otherwise noted.

E.C. JORDAN CO.


Supervisor Richard A. Kozene
Laboratory Manager

Supplemental Information

Sampling Site: As Noted
Sampled By: E.C. Jordan Company
Authorization: 4465-91

Analytical Methods: 1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-79-020, U.S. Environmental Protection Agency, March 1978.
2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
3. Others as designated.

Table 3. Results of quality control measurements conducted on September 19, 1985 for volatile organic compounds.

Compound	Measured Value (µg/l)	EPA Reference Standard, WP 781 ¹	
		True Value (µg/l)	Acceptance Range ¹ (µg/l)
Methylene chloride	34.9	40.0	D - 88.4
1,1,-dichloroethene	30.0	20.8	D - 48.7
Trans-1,2-dichloroethene	65.6	55.2	29.8 - 86.1
1,2-dichloroethane	38.0	25.0	12.3 - 38.8
Carbon tetrachloride	28.6	26.6	18.6 - 37.2
1,2-dichloropropane	43.1	40.0	D - 84.0
Trichloroethene	51.2	49.6	35.2 - 77.9
Dibromochloromethane	42.9	29.6	15.7 - 44.2
1,1,2,2-tetrachloroethane	66.9	50.6	23.3 - 79.4
Chlorobenzene	30.9	40.4	14.9 - 64.6

¹ Corresponds to EPA's specified acceptance range for percent recovery for method 624.

² D = Detected; result must be greater than zero.

Table 4A
Results of Quality Control Measurements Conducted on
September 24, 1985 for Semi-Volatile Organic
Compounds in EPA Reference Standard WP482,
Base/Neutral Extractables 1, Concentrate 2

Compound	Measured	EPA Reference Standard, WP482	
	Value (µg/L)	True Value (µg/L)	Acceptance Range* (µg/L)
Bis-2-chloroethylether	293	253	31-400
1,3-Dichlorobenzene	117	148	D-255
1,2-Dichlorobenzene	218	250	80-323
Nitrosodipropylamine	350	352	D-810
Isophorone	115	149	31-292
Bis(2-chloroethoxy)methane	257	253	84-469
1,2,4-Trichlorobenzene	186	256	113-364
Hexachlorobutadiene	91	157	38-261
2-Chloronaphthalene	154	251	151-296
2,6-Dinitrotoluene	243	229	115-362
2,4-Dinitrotoluene	271	277	108-385
Diethylphthalate	107	254	D-290
Hexachlorobenzene	294	350	D-532
Phenanthrene	183	202	109-242
Dibutylphthalate	299	252	3-297
Pyrene	458	298	155-343
Benzo(a)anthracene	348	315	104-450
Diethylphthalate	316	230	9-336
Benzo(k)fluoranthene	474	246	27-399

* Corresponds to EPA's specified acceptance range for percent recovery for Method 625.

D = Detected; result must be greater than zero.

Table 4B
Results of Quality Control Measurements Conducted on
September 24, 1985 for Semi-Volatile Organic
Compounds in EPA Reference Standard WP482,
Base/Neutral Extractables II, Concentrate 4

Compound	Measured Value (ug/L)	EPA Reference Standard, WP482	
		True Value (ug/L)	Acceptance Range* (ug/L)
1,4-Dichlorobenzene	221	251	50-311
Bis(2-chloroisopropyl)ether	343	204	73-339
Hexachloroethane	176	303	121-342
Nitrobenzene	310	373	131-671
Naphthalene	213	250	53-333
Dimethylphthalate	206	404	D-452
Acenaphthene	186	197	93-286
Fluorene	187	250	148-303
4-Chlorophenyl phenylether	344	374	94-591
4-Bromophenyl phenylether	312	373	198-474
Anthracene	203	200	54-266
Fluoranthene	382	301	78-412
Butylbenzyl phthalate	385	250	D-380
Chrysene	348	209	36-393
Bis(2-ethylhexyl)phthalate	331	153	12-242
Benzo(b)fluoranthene	225	203	49-323
Benzo(a)pyrene	270	224	38-365
Dibenzo(a,h)anthracene	135	204	D-463
Benzo(g,h,i)perylene	324	300	D-657

* Corresponds to EPA's specified acceptance range for percent recovery for Method 625.

D = Detected; result must be greater than zero.

Table 4C
Results of Quality Control Measurements Conducted on
September 24, 1985 for Semi-Volatile Organic
Compounds in EPA Reference Standard WP881,
Acid Extractables, Concentrate 2

Compound	Measured Value (ug/L)	EPA Reference Standard, WP482	
		True Value (ug/L)	Acceptance Range*
2-Chlorophenol	334	300	69-402
2-Nitrophenol	197	250	73-455
Phenol	148	250	13-280
2,4-Dimethylphenol	122	150	48-179
2,4-Dichlorophenol	185	250	98-338
2,4,6-Trichlorophenol	139	250	93-360
4-Chloro-3-methylphenol	102	225	50-331
2-Methyl-4,6-dinitrophenol	492	750	D-1,358
Pentachlorophenol	296	375	53-660
4-Nitrophenol	76	250	D-330

* Corresponds to EPA's specified acceptance range for percent recovery for Method 625.

D = Detected; result must be greater than zero.

Table 4D
Results of Quality Control Measurements Conducted on
September 24, 1985 for Semi-Volatile Organic
Compounds in EPA Reference Standard WP881,
Pesticides, Concentrate 4

Compound	Measured Value (µg/L)	EPA Reference Standard, WP482	
		True Value (µg/L)	Acceptance Range* (µg/L)
Beta-BHC	91	200	48-298
Endosulfan I	24	180	NA
4,4'-DDE	44	40	2-54
4,4'-DDT	33	30	D-61

* Corresponds to EPA's specified acceptance range for percent recovery for Method 625.

NA= Not available; range not provided by EPA.

D = Detected; result must be greater than zero.

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

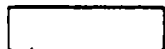
15-3

1 LOCATION OF WELL			2 FORMATION		3 OWNER OF WELL	
County	Twp.	Fraction	Section No.	Town	Range	
Lapeer	Metomora	NE 1/4 NE 1/4 SE 1/4	15	6	10	
Name And Direction from Road Intersections			OWNER OF WELL:			
Street address & City of Well Location			Address			
Gardner, Metomora			GARY WAGNER			
			194 ft. 2-26-69			
			4 WELL DEPTH: (completed) Date of Completion			
			5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig			
			☐ Hollow rod ☐ Jomed ☐ Bored ☐			
			6 USE: ☒ Domestic ☐ Public Supply ☐ Industry			
			☐ Irrigation ☐ Air Conditioning ☐ Commercial			
			☐ Test Well ☐			
			7 CASING: Threaded ☐ Welded ☒ Height: Above/Below			
			4 in. to 190 ft. Depth surface 1 ft.			
			Weight 11 lbs./ft.			
			Drive Shop? Yes ☐ No ☒			
			8 SCREEN:			
			Type: Ex-Rdue Dia. 3"			
			Size/Gauge: 212 Length 4'			
			Set between 190 ft. and 194 ft.			
			Fittings: 3" x 18" nipple			
			NEUPRONA Well Jack			
			9 STATIC WATER LEVEL			
			100 ft. below land surface			
			10 PUMPING LEVEL below land surface			
			150 ft. after 7 hrs. pumping 40 g.p.m.			
			ft. after hrs. pumping g.p.m.			
			11 WATER QUALITY in Parts Per Million:			
			Iron (Fe) Chlorides (Cl)			
			Hardness			
			12 WELL HEAD COMPLETION: ☐ In Approved Pit			
			☒ Pitless Adapter ☒ 12" Above Grade			
			13 GROUTING:			
			Well Grouted? ☐ Yes ☐ No			
			Material: ☐ Mortar Cement ☐			
			Depth: From ft. to ft.			
			14 SANITARY: None at time of Drilling			
			Nearest Source of possible contamination			
			ft. Direction Type			
			Well disinfected upon completion ☐ Yes ☐ No			
			15 PUMP:			
			Manufacturer's Name Meyers			
			Model Number SD10A 51 HP 1			
			Length of Drop Pipe 147 ft. capacity 150 g.p.m.			
			Type: ☒ Submersible ☐			
			☐ Jet ☐ Registering			
16 Remarks, elevation, source of sand, etc.			17 WATER WELL CONTRACTOR'S CERTIFICATION:			
ADDED INFO. BY DRILLER ITEM NO.			This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.			
CORRECTED BY:			Metomora Well Drilling 0277			
REVISION BY:			REGISTERED BUSINESS NAME			
			Address 3275 S Lapeer Rd Metomora			
			Signed Harrison H. Kunkin 5-2-69			
			AUTHORIZED REPRESENTATIVE			

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-4

100m (Rev. 12-88)



APR 02 1973

WATER WELL RECORD

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MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

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1 LOCATION OF WELL		TOWNSHIP AND RANGE		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
County: <u>Lapeer</u>		Township: <u>Metamora</u>		Section: <u>Sub.</u>		Town: <u>6 N</u>		Range: <u>10 E</u>	
Distance and Direction from Road Intersections <u>375' N of Center</u> <u>100' E of Cloud Rd.</u>		Street address & City of Well Location Locate with "X" in section below		Sketch Map:		3 OWNER OF WELL <u>Robert Dwyer</u>		Address: [REDACTED]	
Sketch Map: <u>Metamora Heights</u> <u>Sub.</u> <u>Cloud</u>		2 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		4 WELL DEPTH (Completed) Date of Completion <u>170 ft.</u> <u>3-27-73</u>	
Dry gravel		100'		100'		5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig		6 USE: ☒ Domestic ☐ Public Supply ☐ Industry	
Clay		30'		130'		7 CASING: Threaded ☒ Welded ☐ Height: Above/Surface <u>1</u> ft.		8 SCREEN: Type: <u>Stainless</u> Dia.: <u>3"</u>	
Water bearing strata		40'		170'		8 in. to <u>166</u> ft. Depth <u>11</u> lbs./ft.		Set between <u>166</u> ft. and <u>170</u> ft.	
						Fittings: <u>3 x 1/8 n.p.m.</u>		9 STATIC WATER LEVEL <u>100</u> ft. below land surface	
						10 PUMPING LEVEL below land surface <u>165</u> ft. after <u>2</u> hrs. pumping <u>25</u> g.p.m.		11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____	
						Hardness _____ Other _____		12 WELL HEAD COMPLETION: ☐ In Approved Pit	
						☐ Pitless Adapter ☒ 12" Above Grade		13 Well Grouted? ☒ Yes ☐ No	
						☐ Neat Cement ☐ Grout ☒ Aggregate		Depth: From <u>0</u> ft. to <u>166</u> ft.	
						14 Nearest Source of possible contamination <u>60</u> feet <u>W</u> Direction <u>Septic</u> Type		Well disinfected upon completion ☒ Yes ☐ No	
						15 PUMP: ☒ Not installed		Manufacturer's Name _____	
						Model Number _____ HP _____ Volts _____		Length of Drop Pipe _____ ft. capacity _____ G.P.M.	
						Type: ☐ Submersible		☐ Jet ☐ Reciprocating	
16 Remarks, elevation, source of data, etc. ADDED INFO. BY <u>UNLAWFUL</u> <u>MAN</u> EXCISED BY <u>J</u> ADDITION BY _____		17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief <u>Metamora Well Drilling</u> 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>1640 Wendover Metamora</u> Signature <u>Robert Dwyer</u> Date <u>3/27/73</u> AUTHORIZED REPRESENTATIVE							

WATER WELL RECORD

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MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-6

LOCATION OF WELL		Twp.	Range	Section No.	Tran.	Range
ADCA		METAMORA	10	5	E	10
Name and Direction from Road Intersections		OWNER OF WELL: DARREL NELSON				
11. W-21-24		MAYLOW LANE				
Address & City of Well Location		METAMORA				
FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	WELL DEPTH: (sum of 5 & 6) 183 ft. Date of Completion 9/10/69			
TOP SOIL	1'	1'	5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug			
EXPOSED CLAY	33'	34'	☐ Hollow rod ☐ Jetted ☐ Bored ☐			
FINE GRAINING SAND	30'	64'	6 USE: ☒ Domestic ☐ Public Supply ☐ Industry			
BLUE CLAY	53'	117'	☐ Irrigation ☐ Air Conditioning ☐ Commercial			
SILTY CLAY	45'	162'	☐ Test Well ☐			
MEDIUM SAND	11'	173'	7 CASING: Threaded ☐ Welded ☐ Height Above/Below surface 1 ft.			
COURSE SAND	10'	183'	2 in. to 179 ft. Depth Weight 770 lb./ft. Drive Shoes? Yes ☒ No ☐			
			8 SCREEN: 2" BLAYTON MARK 2" 60 Length 41' Set between 179 ft. and 183 ft. Filings: 3 PIPE & K PACK			
			9 STATIC WATER LEVEL 55 ft. below land surface			
			10 PUMPING LEVEL below land surface 84 ft. after 2 hrs. pumping 8 g.p.m. ft. after hrs. pumping g.p.m.			
			11 WATER QUALITY in Parts Per Million: Iron (Fe) Chlorides (Cl) NOT TESTED			
			12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade			
			13 GROUTING: Well Grouted? ☒ Yes ☐ No Material: ☐ Neat Cement ☒ PORTLAND Cement Depth: From 0 ft. to 23 ft.			
			14 SANITARY: Nearest Source of possible contamination 60 feet W Direction SEPTIC Type Well disinfected upon completion ☒ Yes ☐ No			
			15 PUMP: Manufacturer's Name Model Number Length of Drop Pipe ft. capacity g.p.m. Type: ☐ Submersible ☒ Surface ☒ Jet N ST			
16 Remarks, elevation, source of data, etc.			17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. 119 DOWELL WELL DRILL 1116 REGISTERED BUSINESS NAME REGISTRATION NO. Address 451 COLUMBIAN RD. Houghton Mich 49931 Date 9/11/69 AUTHORIZED REPRESENTATIVE			

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

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1 LOCATION OF WELL

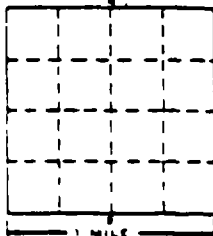
County <u>Super</u>	Township Name <u>Metamora</u>	Fraction <u>1/4</u> <u>1/4</u>	Section Number <u>15</u>	Town Number <u>6</u> N.E.	Range Number <u>10</u> E.
---------------------	-------------------------------	--------------------------------	--------------------------	---------------------------	---------------------------

Distance And Direction from Road Intersections

Street address & City of Well Location

Locate with "X" in section below

Sketch Map:



*Metamora Heights
Subdivision
Lot 22*

3 OWNER OF WELL:

Address

4 WELL DEPTH: 185 ft. 3-29-715 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig
☐ Hollow rod ☐ Jetted ☐ Bored ☐6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well7 CASING: Threaded ☐ Welded ☒ Height: Above/Surface4 in. to 181 ft. Depth 1 ft. Surface
in. to 185 ft. Depth 11 lbs./ft. Weight
Drive Shoe? Yes ☐ No ☒

8 SCREEN:

Type: Reinforced Dia: 3"
Size/Gauge: 012 Length 4'
Set between 181 ft. and 185 ft.
Fittings: 3x18 nipple
nutrunner maker

9 STATIC WATER LEVEL

130 ft. below land surface
10 PUMPING LEVEL below land surface
175 ft. after 24 hrs. pumping 15 g.p.m.
ft. after hrs. pumping g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Chlorides (Cl)
Hardness Other

12 WELL HEAD COMPLETION:

☐ In Approved Pit ☒ 12" Above Grade Curbed Tank
☐ Pillock Adapter13 Well Grouted? ☐ Yes ☒ No☐ Neat Cement ☐ Benzoinite ☐
Depth: From ft. to ft.

14 Nearest Source of possible contamination

75 feet SE Direction Septic Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

☒ Not installed
Manufacturer's Name Red Jacket
Model Number 6-PSM-12EC 1/4" Vols 220
Length of Drop Pipe 168 ft. capacity 15 g.p.m.
Type: ☒ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

INFO BY DRILLER, Item No.

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true
to the best of my knowledge and belief.Metamora Well Drilling 0397
REGISTERED BUSINESS NAME REGISTRATION NO.Address 1140 Hendrix MetamoraSigned Monty J. Ford Date 4-10-72
AUTHORIZED REPRESENTATIVE

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

156

1 LOCATION OF WELL

County Lapeer Twp. North Fraction 1/4 Section No. 15 Town 6 N. 16 E. 16
State and Direction from Road Intersections
M. W. N-24
100 E MARY LOU LANE
Street address & City of Well Location MARY LOU LANE

OWNER No. 3 OWNER OF WELL HENRY KIMBERLIN

2 FORMATION

THICKNESS
OF
STRATUMDEPTH TO
BOTTOM OF
STRATUMTOP SOIL1'1'BROWN CLAY33'34'FINE SAND30'64'MEDIUM COURSE SAND13'77'COURSE SAND (ACTIVE)9'86'

4 WELL DEPTH: (completed) Date of Completion

86 ft. 9/12/695 ☒ Cable reel ☐ Rotary ☐ Driven ☐ Dig
☐ Hollow rod ☐ Jetted ☐ Bored ☐ 6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☐ 7 CASING: Threaded ☒ Welded ☐ Height: Above/Under
Diam. 2 in. to 2 ft. Depth 1 ft.
Weight 76 lbs./ft. Drive Shear? Yes ☒ No ☐8 SCREEN: CHRYSLER MARK Dia. 4 "
Slot/Gauge #60 Length 4 "
Set between 84 ft. and 86 ft.
Fittings: 3 PIPE + N. PACK9 STATIC WATER LEVEL
49 ft. below land surface10 PUMPING LEVEL below land surface
12 ft. after 3 hrs. pumping 11 a.m.
ft. after hrs. pumping a.m.11 WATER QUALITY in Parts Per Million:
Iron (Fe) Chlorides (Cl)NOT TESTED12 WELL HEAD COMPLETION: ☐ In Approved Pit
☐ Pitless Adapter ☒ 12" Above Grade13 GROUTING:
Well Grouted? ☒ Yes ☐ No
Material: ☐ Neat Cement BECKENITE
Depth: From 0 ft. to 21 ft.14 SANITARY:
Nearest Source of possible contamination
60 feet E Direction SE-TIC type
Well disinfected upon completion ☒ Yes ☐ No15 PUMP:
Manufacturer's Name
Model Number MR
Length of Drop Pipe ft. capacity G.P.M.
Type: ☐ Submersible ☐
100 1 15 100

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true
to the best of my knowledge and belief.
NE DRILLING WELL DRILL 1016
REGISTERED BUSINESS NAME REGISTRATION NO.Address 453 CHURCHVILLE RD
Signed James L. Smith Date 9/17/69
Authorized Representative

WATER WELL RECORD

ACT 294

PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-9

1 LOCATION OF WELL		Twp. <u>Metamora</u>		Section No. <u>15</u>		Town <u>6 N 4 E</u>		Range <u>10 E</u>	
County <u>Lapeer</u>		Fraction <u>1/2 Sec 15</u>		OWNER No. <u>NE NW 1/4</u>		3 OWNER OF WELL: Address <u>Fritz Childs Inc.</u> <u>64441 Von Dyke</u> <u>Romney Mich.</u>			
N. side of Center St. 1500 ft. E of Blood Rd. Street address & City of Well Location		2 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		4 WELL DEPTH: (completed) <u>157</u> ft. Date of Completion <u>6-12-68</u>	
		<u>Red sand & clay gravel</u>		<u>115'</u>		<u>115'</u>		5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jammed ☐ Bored ☐	
		<u>Blue clay</u>		<u>10'</u>		<u>125'</u>		6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐	
		<u>Water bearing gravel</u>		<u>32'</u>		<u>157'</u>		7 CASING: Threaded ☒ Welded ☐ Dia. <u>2</u> in. to <u>153</u> ft. Depth Height: Above/Below surface <u>1</u> ft. Weight <u>11</u> lbs./ft. Driving Shoe? Yes ☒ No ☐	
								8 SCREEN: Type <u>Stainless</u> Dia. <u>3"</u> Slot <u>0.18</u> Length <u>4'</u> Set between <u>153</u> ft. and <u>157</u> ft. Fittings: <u>3" 1 1/8" nipple</u> <u>1/2" cap nut well</u>	
								9 STATIC WATER LEVEL <u>117</u> ft. below land surface	
								10 PUMPING LEVEL below land surface <u>127</u> ft. after <u>7</u> hrs. pumping <u>60</u> g.p.m. ft. after hrs. pumping g.p.m.	
								11 WATER QUALITY in Parts Per Million: Iron (Fe) Chlorides (Cl) Hardness	
								12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade	
								13 GROUTING: Well Grouted? ☐ Yes ☐ No Material: ☐ Mortar Cement ☐ Depth From ft. to ft.	
								14 SANITARY: Nearest Source of possible contamination <u>20</u> feet <u>cl</u> Direction <u>SE</u> Type Well disinfected upon completion ☐ Yes ☒ No	
								15 PUMP: Manufacturer's Name <u>Red Jacket</u> Model Number <u>R75A1988</u> HP <u>3/4</u> Length of Drop Pipe <u>127</u> ft. capacity <u>12</u> g.p.m. Type: ☒ Submersible ☐ ☐ Jet ☐ Roto-pumping	
16 Remarks, elevation, source of data, etc. ADDED INFO. BY DRILLER. ITEM NO. CORRECTED BY: SIGNATURE BY: <u>[Signature]</u>				17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Metamora Well Drilling</u> <u>0329</u> REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>3875 S Lapeer, Metamora</u> Signed <u>Thurston D. Hunt</u> Date <u>6-21-68</u> AUTHORIZED REPRESENTATIVE					

WATER WELL RECORD

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MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1540

1 LOCATION OF WELL

County Lapeer Twp. Metamora Fraction Metamora 1/4 Section No. 15 Sub. 15 Town 6 N. 10 E. 10

Distance And Direction from Road Intersections
0' from North-South Road
50' from East-West Road

OWNER No.

3 OWNER OF WELL:

Richard Jackson
Address [REDACTED]

Street address & City of Well Location

Metamora, Mich.

2 FORMATION

THICKNESS
OF
STRATUMDEPTH TO
BOTTOM OF
STRATUMSand & Gravel110'110'clay & gravel49'159'interbedding sand & gravel25'184'→ 1000' East of BLOOD RD.1/4 mile S. of Dryden RD.

4 WELL DEPTH: (completed)

Date of Completion

184'

ft.

10-24-66

5 ☒ Cable reel ☐ Rotary ☐ Driven ☐ dug
☐ Hollow rod ☐ Jammed ☐ Bored ☐ _____

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☐ _____

7 CASING: Threaded ☐ Welded ☒
Diam. _____ Height: Above/Below
_____ ft. to _____ ft. Depth surface _____ ft.
Weight _____ lbs./ft.
Drive Shear? Yes ☒ No ☐

8 SCREEN:
Type Stainless Dia. 3"
Slot .012 Length 4'
Set between 180 ft. and 184 ft.
Fittings: 3" x 18" nipple, Neoprene well
header

9 STATIC WATER LEVEL
130 ft. below land surface

10 PUMPING LEVEL below land surface
150 ft. after 8 hrs. pumping 45 g.p.m.
_____ ft. after _____ hrs. pumping _____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) _____ Chlorides (Cl) _____
Hardness _____

12 WELL HEAD COMPLETION: ☐ In Approved PH
☒ Pitless Adapter ☒ 12" Above Grade

13 GROUTING:
Well Grouted? ☐ Yes ☒ No
Material: ☐ Mortar Cement ☐ _____
Depth: From _____ ft. to _____ ft.

14 SANITARY:
Nearest Source of possible contamination
60 feet SW Direction Septic Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:
Manufacturer's Name Red Jacket
Model Number R100N1-11AR HP 1
Length of Drop Pipe 168 ft. capacity 10 g.p.m.
Type: ☒ Submersible ☐ _____
☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

add info by Driller Item # 1, 7.
**add by RD 12/12/66

EL. ~ 1120

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true
to the best of my knowledge and belief.

Metamora Well Drilling

REGISTERED BUSINESS NAME

0397

REGISTRATION NO.

Address 3875 So Lapeer Rd. MetamoraSigned Maximilian H. Kershner 11-14-66
AUTHORIZED REPRESENTATIVE

WATER WELL RECORD

ACT 294 PA 1963

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL	
County <u>Lapeer</u>	Town <u>Metamora</u>
Fraction <u>Lot 12</u>	Section No. <u>15</u>
Range <u>10</u>	Elev. <u>151.6</u>
Distance And Direction from Road Intersections <u>1/4 mile W. of M-24</u> <u>1/3 mile N. of Broecker Rd.</u>	
Street address & City of Well Location (<u>Street still unnamed</u>) <u>Metamora</u>	
2 FORMATION	
Red clay + sand	THICKNESS OF STRATUM <u>50'</u>
Water bearing sand	DEPTH TO BOTTOM OF STRATUM <u>50'</u>
Blue clay	THICKNESS OF STRATUM <u>70'</u>
Water bearing sand	DEPTH TO BOTTOM OF STRATUM <u>130'</u>
3 OWNER OF WELL:	
Name <u>R. Mallow</u>	
Address <u>[REDACTED]</u>	
4 WELL DEPTH (feet) Date of Completion	
<u>145</u> ft. <u>3-18-67</u>	
5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig	
☐ Hollow rod ☐ Jetted ☐ Bored ☐	
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry	
☐ Irrigation ☐ Air Conditioning ☐ Commercial	
☐ Test Well ☐	
7 CASING: Threaded ☐ Welded ☒ Height: Above/Below	
Dipm. <u>4</u> in. to <u>141</u> ft. Depth surface <u>1</u> ft.	
Weight <u>11</u> lbs./ft.	
Driving Shoe? Yes ☒ No ☐	
8 SCREEN:	
Type <u>Stainless</u> Dia. <u>3"</u>	
Slot <u>.012</u> Length <u>4'</u>	
Set between <u>141</u> ft. and <u>145</u> ft.	
Fittings: <u>3" x 1/2" nipple</u>	
<u>Neoprene well packer</u>	
9 STATIC WATER LEVEL	
<u>50</u> ft. below land surface	
10 PUMPING LEVEL below land surface	
<u>70</u> ft. after <u>6</u> hrs. pumping <u>60</u> g.p.m.	
11 WATER QUALITY in Parts Per Million:	
Iron (Fe) <u> </u> Chlorides (Cl) <u> </u>	
Hardness <u> </u>	
12 WELL HEAD COMPLETION: ☐ In Approved Pit	
☒ Pitless Adapter ☒ 12" Above Grade	
13 GROUTING:	
Well Grouted? ☐ Yes ☒ No	
Material: ☐ Neat Cement ☐	
Depth: From <u> </u> ft. to <u> </u> ft.	
14 SANITARY:	
Nearest Source of possible contamination	
<u>100</u> feet <u>NW</u> Direction <u>Septic</u> Type	
Well disinfected upon completion ☒ Yes ☐ No	
15 PUMP:	
Manufacturer's Name <u>Red Jacket</u>	
Model Number <u>REONQ 788</u> HP <u>1/2</u>	
Length of Drop Pipe <u>24</u> ft. capacity <u>20</u> G.P.M.	
Type: ☒ Submersible ☐	
☐ Jet ☐ Reciprocating	
16 Remarks, elevation, source of data, etc.	
ADDED INFO BY DRILLER, ITEM NO. <u> </u>	
CORRECTED BY: <u> </u>	
CALCULATION BY: <u> </u>	
DATE <u>3-18-67</u>	
17 WATER WELL CONTRACTOR'S CERTIFICATION:	
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.	
Metamora Well Drilling <u>0397</u>	
REGISTERED BUSINESS NAME REGISTRATION NO.	
Address <u>3875 So Lapeer Rd, Metamora</u>	
Signed <u>Thurston D. Gaud</u> Date <u>3-18-67</u>	
AUTHORIZED REPRESENTATIVE	

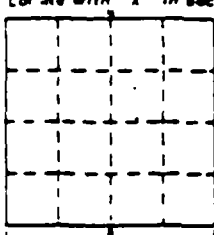
SEP 15 1972

WATER WELL RECORD

ACT 294 PA 1969

MICHIGAN DEPARTMENT
OF PUBLIC HEALTH

15-11

1 LOCATION OF WELL		Township Name		Section Number		Town Number		Range Number	
County <u>Lapeer</u>		<u>Metamora</u>		<u>15</u>		<u>6 N.E.</u>		<u>10 E.</u>	
Distance and Direction from Road Intersections <u>Lot #58, Lake Metamora Heights</u>					3 OWNER OF WELL: <u>James Whelan</u>				
Street Address & City of Well Location Locate with "X" in section below					Address <u>[REDACTED]</u>				
Sketch Map: 					4 WELL DEPTH: (completed) Date <u>[REDACTED]</u> <u>800</u> ft.				
2 FORMATION					5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well				
					6 CASING: Threaded ☒ Welded ☐ Height: Above Surface <u>1</u> ft. Diam. <u>4</u> in. to <u>105</u> ft. Depth <u>11</u> lbs./ft. Drive Shoe? yes ☒ no ☐				
					8 SCREEN: <u>---</u> Type: _____ Dia.: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____				
Clay					9 STATIC WATER LEVEL <u>2</u> ft. below land surface				
Gravel					10 PUMPING LEVEL below land surface <u>60</u> ft. after <u>1</u> hrs. pumping <u>80</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.				
Clay					11 WATER QUALITY in Parts Per Million: _____ Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____				
Sandstone					12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Private Adapter ☒ 12" Above Grade				
					13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Grout ☒ Aqua Gel Depth: From <u>0</u> ft. to <u>105</u> ft.				
					14 Nearest Source of possible contamination <u>none</u> _____ feet _____ Direction _____ Type _____ Well disinfected upon completion ☐ Yes ☒ No				
					15 PUMP: ☐ Not Installed Manufacturer's Name <u>Red Jack</u> Model Number <u>850N1986</u> No. <u>220</u> Length of Drop Pipe <u>42</u> ft. capacity <u>15</u> g.p.m. Type: ☒ Submersible ☐ Jet ☐ Recirculating				
16 Remarks, elevation, source of data, etc. <u>USE A 2ND SHEET IF NEEDED</u> <u>ILLUSTRATION BY</u> <u>BY</u> <u>JD</u> <u>EXPOSITION</u> <u>80</u>					17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Metamora Well Drilling</u> <u>0397</u> REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>1640 Hendrix, Metamora</u> Signed <u>Remondt</u> Date <u>8-2-72</u> AUTHORITIES REPRESENTATIVE				

JUN 03 1980

WATER WELL RECORD

ACT 294 PA 1985

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-12

1 LOCATION OF WELL

County Leapeer	Township Name Metamora	Fraction N 1/2 S 1/2 E 1/4	Section Number 15	Town Number 6 N/S	Range Number 10 E/W
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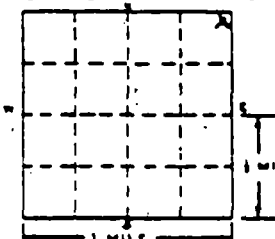
Distance And Direction from Road Intersections

300' W. of Gardner Rd.
125' S. of Dryden Rd.

Street address & City of Well Location

Locate with "X" in section below

Sketch Map:



Dryden Rd
125' ↓ X
300' ← Gardner Rd

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Gravel	92	92
Clay & Gravel	38	130
Clay	15	145
Clay & Gravel	65	210
Clay	60	270
Water bearing gravel	31	301

3 OWNER OF WELL:

Pat Holmes

4 WELL DEPTH: (completed) Date of Completion

301 ft. 5-24-80

☐ Cable tool	☒ Rotary	☐ Driven	☐ Dig
☐ Hollow rod	☐ Jetted	☐ Bored	☐

☒ Domestic	☐ Public Supply	☐ Industry
☐ Irrigation	☐ Air Conditioning	☐ Commercial
☐ Test Well		

7 CASING: Threaded ☒ Welded ☐	Height: Above/Below Surface <u>1</u> ft.
<u>4</u> in. to <u>294</u> ft. Depth	Weight <u>11</u> lbs./ft.
<u>4</u> in. to <u>294</u> ft. Depth	Drive Shoe? Yes ☐ No ☐

8 SCREEN:	
Type: <u>stainless</u>	Dia.: <u>3"</u>
Slot/Gauge <u>25</u>	Length <u>4'</u>
Set between <u>297</u> ft. and <u>301</u> ft.	
Fittings:	

9 STATIC WATER LEVEL
180 ft. below land surface

10 PUMPING LEVEL below land surface	
<u>180</u> ft. other <u>3</u> hrs. pumping <u>25</u> g.p.m.	
<u>180</u> ft. other <u>hrs.</u> pumping <u>g.p.m.</u>	

11 WATER QUALITY in Parts Per Million:	
Iron (Fe)	Chlorides (Cl)
Hardness _____ Other _____	

12 WELL HEAD COMPLETION:	☐ In Assembled Pit
☒ Pillage Adapter	☐ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No	
☐ Not Cement ☐ Grout	<u>SDG</u>
Depth: From <u>0</u> ft. to <u>297</u> ft.	

14 Nearest Source of possible contamination	
<u>25'</u> feet <u>E</u> Direction <u>septic</u> Type	
Well disinfected upon completion ☒ Yes ☐ No	

15 PUMP:	☐ Not Installed
Manufacturer's Name <u>Red Jacket</u>	
Model Number <u>75R1CR125C</u>	<u>3/4</u> hp <u>220</u>
Length of Drop Pipe <u>180</u>	capacity <u>20</u> g.p.m.
Type: ☒ Submersible	
☐ Jet	☐ Raising/lifting

16 Remarks, elevation, source of data, etc.

ADDED INFO BY DRILLER, ITEM NO.

CORRECTED BY

ADDITION BY

ELEVATION

DATE IN

Elev ~ 112.0'

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

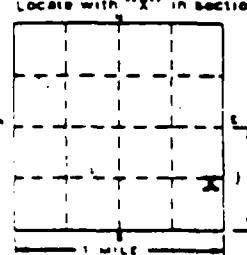
REGISTERED BUSINESS NAME RELLING REGISTRATION NO. 6357Address 1200 Inalt City Rd., LeapeerSigned [Signature] Date 5-27-80

AUTHORIZED REPRESENTATIVE

NOV - 1976

WATER WELL RECORD
ACT 284 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

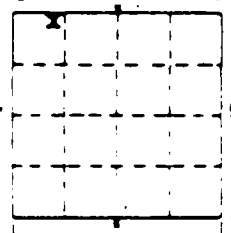
15-13

1 LOCATION OF WELL County: <u>Lapeer</u>		Township Name: <u>Metamora</u>		Fraction: <u>NE 1/4 SE 1/4 (SE)</u>		Section Number: <u>15</u>		Town Number: <u>6 N 1/4</u>		Range Number: <u>10 E 1/4</u>	
2 Distance And Direction from Road Intersections: <u>1/4 M. N of Hendrie Rd.</u> <u>600' W. of Gardner Rd.</u> Street address & City of Well Location: Locate with "X" in section below  600' 1/4 m. N Hendrie Gardner						3 OWNER OF WELL: <u>Neill Peters</u> Address: [REDACTED]					
						4 WELL DEPTH: (Tested) <u>380</u> ft. Date of Completion: <u>9-29-76</u>					
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jetted ☐ Bored ☐ Auger						6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐					
						7 CASING: Threaded ☒ Welded ☐ Height: Above Ground Diam. _____ Surface <u>1</u> ft. Weight <u>11</u> lbs./ft. Drive Shoe? Yes ☒ No ☐					
2 FORMATION			THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		8 in. to <u>305</u> ft. Depth				
							ft. to _____ ft. Depth				
							8 SCREEN: _____ Type: _____ Dia: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____				
							9 STATIC WATER LEVEL <u>120</u> ft. below land surface				
							10 PUMPING LEVEL below land surface <u>180</u> ft. after <u>3</u> hrs. pumping <u>25</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.				
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. CORRECTED BY ADDITION BY <u>Chm</u> ELEVATION DEPTH TO ROCK							11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____				
							12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade				
							13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ SDG Depth: From <u>0</u> ft. to <u>305</u> ft.				
							14 Nearest Source of possible contamination <u>None</u> _____ feet _____ Direction _____ Type _____ Well disinfected upon completion ☒ Yes ☐ No				
							15 PUMP: ☐ Not installed Manufacturer's Name <u>Red Jacket</u> Model Number <u>2100N1 1400 1</u> Volts <u>220</u> Length of Drive Pipe <u>189</u> ft. capacity <u>100</u> g.p.m. Type: ☒ Submersible ☐ Jet ☐ Reciprocating				
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>METAMORA WELL DRILLING</u> <u>0307</u> REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>1200 Inlay City Rd., Lapeer</u> <u>[Signature]</u> Date <u>9-30-76</u> AUTHORIZED REPRESENTATIVE											

JUN 05 1979

WATER WELL RECORD
ACT 204 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-14

1 LOCATION OF WELL			2 FORMATION			3 OWNER OF WELL		
County Lapeer	Township Name N 22° 02'	Section 15	Thickness of Stratum	Depth to Bottom of Stratum	Owner Name Glen Bruce	Address [REDACTED]		
Distance and Direction from Road Intersections E. of Blood Rd. 200' S. of Center St. Street address & City of Well Location 1614 Center St. Locate with "X" in section below 			Well Depth: 360 ft. Date of Completion 5-22-79 5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Juted ☐ Bored ☐ 6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ 7 CASING: Threaded ☒ Welded ☐ Height Above Surface Dia. 4 in. to 333 ft. Depth 11 lbs./ft. Drive Shoe? ☒ Yes ☐ No					
Sand, clay & gravel 28 28 Clay & gravel 196 224 Clay 100 333 Sandstone 47 360			8 SCREEN: Type: _____ Dia: _____ Size/Gauge: _____ Length: _____ Set between _____ ft. and _____ ft. Fittings: _____ 9 STATIC WATER LEVEL 150 ft. below land surface 10 PUMPING LEVEL below land surface 260 ft. after 3 hrs. pumping 25 g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m. 11 WATER QUALITY in Parts Per Million: _____ Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____ 12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter 53 12" Above Grade. 13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ Depth: From _____ ft. to 333 ft. 14 Nearest Source of possible contamination 25 feet NE Direction septic Type Well disinfected upon completion ☒ Yes ☐ No 15 PUMP: ☐ Not installed Manufacturer's Name Red Jacket Model Number 100-1 1420-1 Vols 220 Length of Drop Pipe 180 ft. capacity 10 G.P.M. Type: ☒ Submersible ☐ Jet ☐ Reciprocating 16 Remarks, elevation, source of data, etc. HOLE DRILL BY: WILLIAM, ITEM NO. CONNECTED BY: Gary EW 1130 AUTHORIZED BY: Gary ELEVATION DEPTH TO ROCK 17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metecore well drilling 44-1337 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Inley City Rd., Lapeer Signature William J. Smith Date 5-23-79 AUTHORIZED REPRESENTATIVE					

AUG 04 1975

WATER WELL RECORD
ACT 284 PA 1968MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-15

1 LOCATION OF WELL		County		Township Name		Section		Section Number		Town Number		Range Number	
Lapeer		Metamora		SE. NE. (NE)		15		6 N/E		10 E/W			
Distance and Direction from Road Intersections						3 OWNER OF WELL							
1/4 M. S. of Dryden Rd.,						Robert Ragan							
1/8 M. W. of Gardner Rd.,						Address							
Street address & City of Well Location						4 WELL DEPTH: (Completed) Date of Completion							
Locate with "X" in section below						340 ft. 7-15-75							
Sketch Map:						5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig							
						6 ☐ Hollow rod ☐ Jotted ☐ Bored ☐ Other							
						7 USES: ☒ Domestic ☐ Public Supply ☐ Industry							
						☐ Irrigation ☐ Air Conditioning ☐ Commercial							
						8 CASING: Threaded ☒ Welded ☐ Weight: Above/Below							
						4 in. to 297 ft. Depth Surface 1 ft.							
						Weight 11 lbs./ft. Drive Shoe? Yes ☒ No ☐							
2 FORMATION						9 SCREEN:							
Dry gravel						Type: _____ Dia: _____							
Clay						Size/Gauge _____ Length _____							
Clay & gravel						Set between _____ ft. and _____ ft.							
Clay & boulders						Fittings: _____							
Sandstone						10 STATIC WATER LEVEL							
						120 ft. below land surface							
						10 PUMPING LEVEL below land surface							
						160 ft. after 3 hrs. pumping 100 g.p.m.							
						_____ ft. after _____ hrs. pumping _____ g.p.m.							
						11 WATER QUALITY in Parts Per Million:							
						Iron (Fe): _____ Chlorides (Cl): _____							
						Hardness _____ Other _____							
						12 WELL HEAD COMPLETION: ☐ in Approved Pit							
						☐ Pitless Adapter ☒ 12" Above Grade							
						13 Well Grouted? ☒ Yes ☐ No							
						☐ Neat Cement ☐ Bentonite ☒ SDG							
						Depth: From 0 ft. to 297 ft.							
						14 Nearest Source of possible contamination none							
						_____ feet _____ Direction _____ Type _____							
						Well disinfected upon completion ☒ Yes ☐ No							
						15 PUMP ☒ Not installed							
						Manufacturer's Name _____							
						Model Number _____ HP _____ Volts _____							
						Length of Drive Pipe _____ ft. capacity _____ G.P.M.							
						Type: ☐ Submersible ☐ Jet ☐ Reciprocating							
16 Remarks, elevation, source of data, etc.						17 WATER WELL CONTRACTOR'S CERTIFICATION:							
ADDED INFO BY DRILLER, ITEM NO.						This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.							
CORRECTED BY						Metamora Well Drilling 0397							
ADDITION BY G.M. E.V. 1092						REGISTERED BUSINESS NAME REGISTRATION NO.							
ELEVATION						Address 1200 Inlay City Rd., Lapeer							
DEPTH TO ROCK						Signed <i>Robert Ragan</i> Date 7-21-75							
						AUTHORIZED REPRESENTATIVE							

JAN 04 1978

WATER WELL RECORD
ACT 284 PA 1965MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1576

1 LOCATION OF WELL		Township Name		Fraction		Section Number		Town Number		Range Number	
County		Lapeer		Metamora		NW 1/4 NW 1/4		15		6 N.E. 10 E.W.	
Distance And Direction from Road Intersections											
Street address & City of Well Location											
Locate with "X" in section below											
Search Map:											
3 OWNER OF WELL: Francis Gordert											
4 WELL: 380 ft. 11/9/77											
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig											
☐ Hollow rod ☐ Jotted ☐ Bored ☐ Other											
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry											
☐ Irrigation ☐ Air Conditioning ☐ Commercial											
☐ Test Well ☐ Other											
7 CASING: Threaded ☒ Welded ☐ Height: Above/Below											
4 in. to 312 ft. Depth Surface 1 ft.											
Weight 11 lbs./ft.											
Drive Shoe? Yes ☒ No ☐											
8 SCREEN: NO											
Type: _____ Dia: _____											
Slot/Gauge _____ Length _____											
Set between _____ ft. and _____ ft.											
Fittings: _____											
9 STATIC WATER LEVEL: 134 ft. below land surface											
10 PUMPING LEVEL below land surface											
380 ft. after 2 hrs. pumping 25 g.p.m. with air											
_____ ft. after _____ hrs. pumping _____ g.p.m.											
11 WATER QUALITY in Parts Per Million:											
Iron (Fe) _____ Chlorides (Cl) _____											
Hardness _____ Other _____											
12 WELL HEAD COMPLETION: ☐ In Approved Pit											
☒ Pitless Adapter ☐ 12" Above Grade											
13 Well Grouted? ☒ Yes ☐ No											
☐ Next Cement ☐ Somewhat ☒ thick heavy mud											
Depth: From 0 ft. to 134 ft.											
14 Nearest Source of possible contamination											
50 feet E Direction septic Type _____											
Well disinfected upon completion ☒ Yes ☐ No											
15 PUMP: ☐ Not installed											
Manufacturer's Name JACUZZI											
Model Number 154C1452 HP 1 Volts 220											
Length of Drop Pipe 168 ft. capacity 13 g.p.m.											
Type: ☒ Submersible											
☐ Jet ☐ Reciprocating											
16 Remarks, elevation, source of data, etc.											
17 WATER WELL CONTRACTOR'S CERTIFICATION:											
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.											
JAMES C. WILCOX WELL DRILLING 0185											
REGISTERED BUSINESS NAME REGISTRATION NO.											
Address 4700 N. Lapeer Rd. Columbiaville, MI											
Signed James C. Wilcox Date 11/9/77											
AUTHORIZED REPRESENTATIVE											

FEB 13 1981

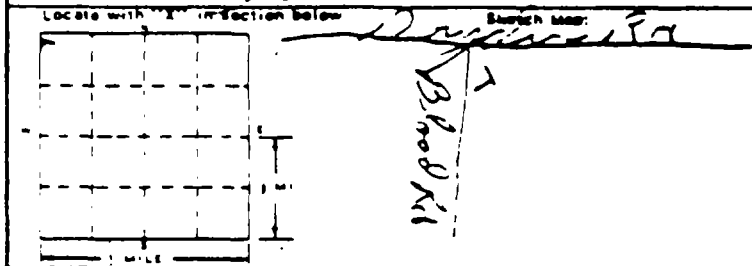
WATER WELL RECORD
ACT 294 PA 1985MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-17

1 LOCATION OF WELL

County Lebanon Township McTear Fraction N. 1/2 Sec. 15 Section Number 15 Town Number 6 N.E. Range Number 10 E.W.

Distance and Direction from Road Intersections
on the SE corner of Black Rd
and Linden Rd
Street address & City of Well Location



3 OWNER OF WELL:
A. Valenti
Address [REDACTED]

4 WELL DEPTH: (Completed) Date of Completion
385 ft. 6-30-80

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig
☐ Hollow rod ☐ Jetted ☐ Bored

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well

7 CASING: Threaded ☒ Welded ☐ Height: Above/Below
Diam. 4 in. to 349 ft. Depth Surface 1 ft.
37 in. to 43 ft. Depth Weight 11 lbs./ft.
Drive Shoe? Yes ☒ No ☐

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
<u>Yellow sand</u>	<u>80</u>	<u>80</u>
<u>Thin clay</u>	<u>10</u>	<u>90</u>
<u>Heavy clay</u>	<u>60</u>	<u>150</u>
<u>Heavy clay</u>	<u>35</u>	<u>185</u>
<u>Thin clay</u>	<u>90</u>	<u>275</u>
<u>Thin clay</u>	<u>15</u>	<u>290</u>
<u>Thin clay</u>		
<u>Thin clay</u>	<u>45</u>	<u>335</u>

8 SCREEN:
Type: _____ Dia: _____
Size/Gauge 10
Set between _____ ft. and _____ ft.
Fittings: _____

9 STATIC WATER LEVEL
120 ft. below land surface

10 PUMPING LEVEL below land surface
ft. after _____ hrs. pumping 50 g.p.m.
110 ft. after 2 hrs. pumping 50 g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) 11.11 Chloride 11.11
Hardness _____ Other _____

12 WELL HEAD COMPLETION: ☐ in Approved Pit
☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No
☐ Neat Cement ☐ Gravelite ☒ Other Thin clay
Depth: From head ft. to 375 ft.

14 Nearest Source of possible contamination
50 feet W Direction Water Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☐ Not installed
Manufacturer's Name _____
Model Number _____ HP 1 Volts 230
Length of Drop Pipe 150 ft. capacity 15 g.p.m.
Type: ☒ Submersible
☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

FOULLED
FACILITY
FACILITY BY SP
ELEVATION
DEPTH TO PUMP

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
James J. Haines
REGISTERED BUSINESS NAME REGISTRATION NO. _____
Address 3497 Haines Rd. Kalamazoo
Signed James J. Haines Date 6-30-80
AUTHORIZED REPRESENTATIVE

OCT 02 1970

WATER WELL RECORD

ACT 204

PA 1966

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		TOWNSHIP NAME		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
Lapeer		Metamora		15		6 N.E.		10 E.E.	
Distance and Direction from Road Intersections		Street Address & City of Well Location		OWNER OF WELL		WELL DEPTH: (Feet)		DATE OF CONSTRUCTION	
2 Blks S. of Center St. on E side of East St.		[Sketch Map: 2 Blks S. of Center St. on E side of East St.]		Richard H. Jackson		165 ft.		8-11-70	
2 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		CASING: Threaded ☐ Welded ☒ Height: Above/Ground Surface <u>1</u> ft.		Weight <u>11</u> lbs./ft. Drive Shoe? Yes ☐ No ☒	
Sand & Gravel		153'		153'		4 in. to 161 ft. Depth			
Under bearing strata		12		165'		in. to ft. Depth			
						SCREEN:			
						Type: <u>Stainless</u> Dia: <u>3"</u>			
						Size/Gauge <u>.012</u> Length <u>4'</u>			
						Set between <u>161</u> ft. and <u>165</u> ft.			
						Fittings: <u>3" x 18" Nipple</u>			
						<u>Neoprene gasket</u>			
						9 STATIC WATER LEVEL			
						<u>128</u> ft. below land surface			
						10 PUMPING LEVEL below land surface			
						<u>150</u> ft. after <u>3</u> hrs. pumping <u>20</u> G.P.M.			
						ft. after hrs. pumping G.P.M.			
						11 WATER QUALITY in Parts Per Million:			
						Iron (Fe) Chlorides (Cl)			
						Hardness Other			
						12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade			
						13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐			
						Depth: From ft. to ft.			
						14 Nearest Source of possible contamination			
						<u>75</u> feet <u>W</u> Direction <u>Septic</u> Type			
						Well disinfected upon completion ☐ Yes ☒ No			
						15 PUMP: ☒ Not installed			
						Manufacturer's Name			
						Model Number HP Volts			
						Length of Drop Pipe ft. capacity G.P.M.			
						Type: ☐ Submersible ☐ Jet ☐ Reciprocating			
16 Remarks, elevation, source of data, etc.						17 WATER WELL CONTRACTOR'S CERTIFICATION:			
						This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.			
						<u>Metamora Well Drilling</u> <u>0397</u>			
						REGISTERED BUSINESS NAME			
						Address <u>640 Hendrie Rd Metamora</u>			
						Signed <u>Thermon D. Stuck</u> <u>8-14-70</u>			
						AUTHORIZED REPRESENTATIVE			

SEP 07 1973

WATER WELL RECORD
ACT 294 PA 1965MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

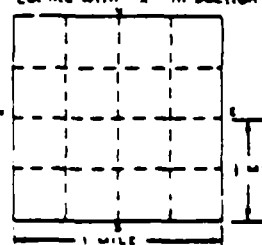
15-19

1 LOCATION OF WELL		TOWNSHIP NAME		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
Lapeer		Metamora		15		6 N/2		10 E/2	
Distance And Direction from Road Intersections				3 OWNER OF WELL: Joseph Crown					
Street Address & City of Well Location				Address					
Metamora Heights Subdivision Lot #17				4 WELL DEPTH: 355 ft. 8-2-73					
2 FORMATION THICKNESS OF STRATUM DEPTH TO BOTTOM OF STRATUM				5 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface <u>1</u> ft.					
				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐					
				7 SCREEN: Type: _____ Dia.: _____ Size/Gauge: _____ Length: _____ Set between _____ ft. and _____ ft. Fittings: _____					
Gravel - dry 140 140 Clay 178 318 Sandstone 37 355				8 STATIC WATER LEVEL <u>150</u> ft. below land surface 10 PUMPING LEVEL below land surface <u>210</u> ft. after <u>1</u> hrs. pumping <u>40</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.					
				11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____					
				12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade					
				13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ Aqua Gel Depth: From <u>0</u> ft. to <u>318</u> ft.					
				14 Nearest Source of possible contamination <u>none</u> _____ feet _____ Direction _____ Type _____ Well disinfected upon completion ☒ Yes ☐ No					
				15 PUMP: ☐ Not installed Manufacturer's Name <u>Red Jacket</u> Model Number <u>R25M 12BC</u> ^{3/4} Vols <u>220</u> Length of Drop Pipe <u>210</u> ft. capacity <u>15</u> g.p.m. Type: ☐ Submersible ☐ Jet ☐ Recirculating					
16 Remarks, elevation, source of data, etc.				17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Metamora Well Drilling</u> <u>0397</u> REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>1200 Inlay City Rd., Lapeer</u> Signed <u>[Signature]</u> Date <u>8-3-73</u> AUTHORIZED REPRESENTATIVE					

AUG 02 1973

WATER WELL RECORD
ACT 204 PA 1965

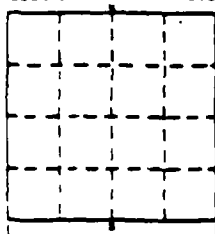
MICHIGAN DEPARTMENT OF PUBLIC HEALTH 15-20

1 LOCATION OF WELL County: <u>Lapeer</u>		Township Name: <u>Metamora</u>	Section: <u>SUB 14</u>	Section Number: <u>15</u>	Town Number: <u>6 N/4</u>	Range Number: <u>10 E/4</u>																											
State and Direction from Road Intersections: <u>.1 Mile R. of Blood Rd.</u> <u>150' N. of Center St.</u> Street Address & City of Well Location: Locate with "X" in section below		Sketch Map:  Metamora Heights Subdivision		3 OWNER OF WELL: Name: <u>Richard Jackson</u> Address: [REDACTED]																													
2 FORMATION <table border="1" style="width: 100%; border-collapse: collapse;"><thead><tr><th style="width: 40%;">FORMATION</th><th style="width: 10%;">THICKNESS OF STRATUM</th><th style="width: 10%;">DEPTH TO BOTTOM OF STRATUM</th></tr></thead><tbody><tr><td>Clay</td><td>8</td><td>8</td></tr><tr><td>Gravel</td><td>78</td><td>86</td></tr><tr><td>Clay</td><td>40</td><td>126</td></tr><tr><td>Gravelly clay</td><td>64</td><td>190</td></tr><tr><td>Gravel</td><td>5</td><td>195</td></tr><tr><td>Clay</td><td>123</td><td>318</td></tr><tr><td>Shale</td><td>12</td><td>330</td></tr><tr><td>Sandstone</td><td>70</td><td>400</td></tr></tbody></table>		FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	Clay	8	8	Gravel	78	86	Clay	40	126	Gravelly clay	64	190	Gravel	5	195	Clay	123	318	Shale	12	330	Sandstone	70	400	4 WELL DEPTH: (Completed) Date of Completion: <u>7-10-73</u> <u>400</u> ft.		5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Juted ☐ Bored ☐		
		FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM																													
Clay	8	8																															
Gravel	78	86																															
Clay	40	126																															
Gravelly clay	64	190																															
Gravel	5	195																															
Clay	123	318																															
Shale	12	330																															
Sandstone	70	400																															
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well		7 CASING: Threaded ☐ Welded ☒ Height: Above/Surface: <u>2</u> ft. Weight: <u>11</u> lbs./ft. Drive Shoe? Yes ☐ No ☐		8 SCREEN: Type: _____ Dia.: _____ Slot/Gauge: _____ Length: _____ Set between _____ ft. and _____ ft. Fittings: _____																													
		9 STATIC WATER LEVEL <u>140</u> ft. below land surface		10 PUMPING LEVEL below land surface <u>350</u> ft. after <u>2</u> hrs. pumping <u>100</u> S.P.M. _____ ft. after _____ hrs. pumping _____ S.P.M.																													
		11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____		12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade																													
		13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ <u>Aqua Gel</u> Depth: From <u>0</u> ft. to <u>330</u> ft.		14 Nearest Source of possible contamination <u>75</u> feet <u>N</u> Direction <u>Septic</u> Type Well disinfected upon completion ☒ Yes ☐ No																													
		15 PUMP: ☐ Not installed Manufacturer's Name: <u>Red Jacket</u> Model Number: <u>R75H1 12BCP 3/4HP 220</u> Length of Drop Pipe: <u>168</u> ft. capacity <u>18</u> P.M. Type: ☒ Submersible ☐ Jet ☐ Riser/Pumping		16 Remarks, elevation, source of data, etc. ADDED BY: <u>[Signature]</u> CORRECTED BY: <u>[Signature]</u> REVISION: <u>[Signature]</u>																													
		17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. _____ REGISTERED BUSINESS NAME: <u>Metamora Well Drilling</u> REGISTRATION NO. <u>0397</u> Address: <u>1200 Inlay City Rd., Lapeer</u> Signed: <u>[Signature]</u> AUTHORIZED REPRESENTATIVE: <u>7-27-73</u>																															

WATER WELL RECORD

ACT 294 PA 1966

MICHIGAN DEPARTMENT
OF PUBLIC HEALTH

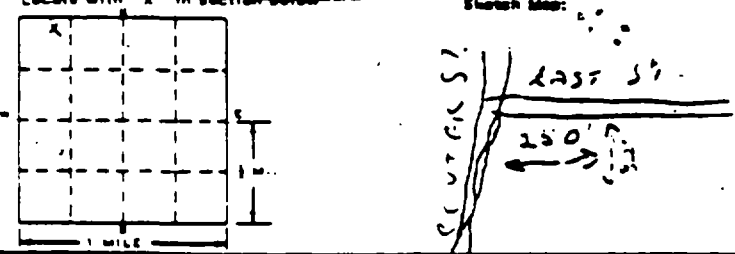
1 LOCATION OF WELL		TOWNSHIP AND RANGE		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
County <u>Lapeer</u>		Township <u>Metamora</u>		Section <u>15</u>		Town <u>Metamora Heights</u>		Range <u>Sub. 10E</u>	
Distance and Direction from Road Intersections <u>1/4 m S. of Dryden Rd</u> <u>100' E. of Blood Rd.</u>				3 OWNER OF WELL: <u>Ralph Darnell</u> Address <u>[REDACTED]</u>					
Street Address & City of Well Location Locality with "X" in section below				4 WELL DEPTH: (Estimated) Date of Completion <u>138</u> ft. <u>6-25-71</u>					
Sketch Map: 				5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Juted ☐ Bored ☐					
				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well					
				7 CASING: Threaded ☒ Welded ☐ Height: Above "0" ft. Diam. <u>4</u> in. to <u>194</u> ft. Depth Surface <u>1</u> ft. Weight <u>11</u> lbs./ft. Drive Shoe? yes ☐ no ☒					
2 FORMATION				THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		8 SCREEN: <u>Stainless</u> Type: <u>.020</u> Dia: <u>3"</u> Slot/Screen <u>134</u> Length <u>4'</u> Set between <u>134</u> and <u>138</u> ft. nipple Fittings: <u>neoprene packer</u>	
<u>Sand & gravel</u>				<u>126</u>		<u>126</u>		9 STATIC WATER LEVEL <u>100</u> ft. below land surface	
<u>Water bearing gravel</u>				<u>12</u>		<u>138</u>		10 PUMPING LEVEL below land surface <u>120</u> ft. after <u>2</u> hrs. pumping <u>60</u> g.p.m. ft. after <u> </u> hrs. pumping <u> </u> g.p.m.	
								11 WATER QUALITY in Parts Per Million: Iron (Fe) <u> </u> Chlorides (Cl) <u> </u> Hardness <u> </u> Other <u> </u>	
								12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade	
								13 Well Grouted? ☐ Yes ☒ No ☐ Non Cement ☐ Bentonite ☐ Depth: From <u> </u> ft. to <u> </u> ft.	
								14 Nearest Source of possible contamination <u>60</u> feet <u>W</u> Direction <u>Septic</u> Type <u> </u> Well disinfected upon completion ☐ Yes ☒ No	
								15 PUMP: ☐ Not Installed Manufacturer's Name <u> </u> Model Number <u> </u> HP <u> </u> Volts <u> </u> Length of Drop Pipe <u> </u> ft. capacity <u> </u> G.P.M. Type: ☐ Submersible ☐ Jet ☐ Rotorpumping	
16 Remarks, elevation, source of data, etc. <u> </u> <u> </u> <u> </u>				17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my supervision and the report is true Who has of my knowledge and belief <u>Metamora Well Drilling 0397</u> REGISTERED BUSINESS NAME REGISTERED NO. Address <u>1640 Hendrix, Metamora</u> <u>Lawrence D. Hink</u> Date <u>6-29-71</u> AUTHORIZED REPRESENTATIVE					

WATER WELL RECORD

ACT 204 PA 1906

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-22

1 LOCATION OF WELL		TOWNSHIP NAME		FRACTION	SECTION NUMBER	TOWN NUMBER	RANGE NUMBER
LAPACK		METAMORA		SW-1/4-1/4	15	6 N.	10 E.
Distance And Direction from Road Intersections 250' W. OF CENTER ST ON EAST ST.				3 OWNER OF WELL: WILLIAM DARNALL			
Street address & City of Well Location Locate with "X" in section below				4 WELL DEPTH: (completed) Date of Completion 151 ft. Sept. 1970			
Sketch Map: 				5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jotted ☐ Bored			
				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well			
				7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface <u>1</u> ft. Dia. <u>4</u> in. to <u>1 1/2</u> ft. Depth <u>147</u> ft. Weight <u>100</u> lbs./ft. In. to <u>1</u> ft. Depth <u>151</u> ft. Drive Shoe? Yes ☒ No ☐			
2 FORMATION				8 SCREEN:			
				Type: <u>JOHNSON SS.</u> Dia. <u>3"</u> Slot/Gauge <u>1/32</u> Length <u>4'</u> Set between <u>147</u> ft. and <u>151</u> ft. Fittings: <u>3" FLEXIBLE COUPLER 18" 3 WELDS</u>			
3/4" 432 E. 1/4 1/4							
33'				3.7'			
92'				40'			
WATER GRADE				140'			
BOTTOMED AT 151'				151'			
				9 STATIC WATER LEVEL <u>127</u> ft. below land surface			
				10 PUMPING LEVEL below land surface _____ ft. after _____ hrs. pumping _____ G.P.M. _____ ft. after _____ hrs. pumping _____ G.P.M.			
				11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____			
				12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade			
				13 Well Grouted? ☐ Yes ☒ No ☐ Root Cement ☐ Bentonite ☐ _____ Depth: From _____ ft. to _____ ft.			
				14 Nearest Source of potable consumption <u>25</u> feet <u>WEST</u> Direction <u>HYDRO TANK TRO</u> Well disinfected upon completion ☒ Yes ☐ No			
				15 PUMP: ☐ Not installed Manufacturer's Name <u>JOHN J. J.</u> Model Number _____ HP _____ Volts _____ Length of Drive Pipe _____ ft. capacity _____ G.P.M. Type: ☐ Submersible ☐ Jet ☐ Recirculating			
16 Remarks, elevation, source of data, etc.				17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. REGISTERED BUSINESS NAME <u>ROSS</u> REGISTRATION NO. <u>1082</u> Address <u>1223 HUMPHREY AVE. S.E.</u> Signed _____ Date <u>SEPT. 1970</u> AUTHORIZED REPRESENTATIVE			

20 1970

WATER WELL RECORD
ACT 234 PA 1965MICHIGAN DEPARTMENT 15-23
OF
PUBLIC HEALTH

1 LOCATION OF WELL		TOWN		RANGE		SECTION		TOWNSHIP		RANGE	
Lapeer		Metamora		SW 1/4		SW 1/4		SW 1/4		10 N	
Distance And Direction from Road Intersections 400' N. of Hendrie Rd. 1/2 M. E. of Blood Rd.		Street address & City of Well Location Locate with "X" in section below		Sketch Map		3 OWNER OF WELL: Bess L. Stevens		4 WELL DEPTH 280 ft. 5-13-70		5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well	
6 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		7 CASING: Threaded ☐ Welded ☒ Weight: Above/Below Surface ☐ ft. Weight ☐ lbs./ft. Drive Shoe? Yes ☐ No ☐		8 SCREEN: Type: <u>Stainless</u> Dia: <u>3"</u> Slot/Screen <u>0.15</u> Length <u>4'</u> Set between <u>97 1/2</u> ft. and <u>280</u> ft. Fittings: <u>plug, nipple & neoprene packer</u>		9 STATIC WATER LEVEL <u>130</u> ft. below land surface	
Clay, gravel & sand		100		100		10 PUMPING LEVEL below land surface <u>184</u> ft. after <u>2</u> hrs. pumping <u>15</u> g.p.m.		11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____		12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade	
Fine quicksand		140		240		13 Well Grouted? ☐ Yes ☒ No ☐ Near Casing ☐ Somewhere ☐ _____ Depth from _____ ft. to _____ ft.		14 Nearest Source of possible contamination <u>75</u> feet <u>5</u> Direction <u>Septic</u> Type ☐ Well disinfected upon completion ☐ Yes ☒ No		15 PUMP: ☐ Not installed Manufacturer's Name <u>Thyres</u> Model Number <u>SDT-A-21</u> 1/2 HP <u>220</u> Length of Drop Pipe <u>184</u> ft. capacity <u>15</u> g.p.m. Type ☒ Submersible ☐ Jet ☐ Reciprocating	
clay		22		262		16 Remarks, elevation, source of data, etc. ASD INFO. BY _____ RECORDED BY: REVISION BY:		17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Metamora Well Drilling</u> 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>1640 Hendrie, Metamora</u> Signed <u>Ernest H. Luck</u> Date <u>6-23-70</u> AUTHORIZED REPRESENTATIVE		18 WATER BEARING SAND & GRAVEL	
Water bearing sand & gravel		18		280							

JUN 30 1970

GEOLOGICAL SURVEY COPY

WATER WELL RECORD
ACT 294 PA 1965MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

95-24

1 LOCATION OF WELL			3 OWNER OF WELL:		
County <u>Lapeer</u>	Twp. <u>Metamora</u>	Section No. <u>15</u>	Owner <u>Robert Ballman</u>		
Tones and Direction from Road Intersections <u>1/4 M. S. of Dryden Rd</u> <u>2 M. W. side of Gardner Rd.</u>			Address [REDACTED]		
Street address & City of Well Location					
2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	4 WELL DEPTH: (completed) Date of Completion		
<u>Heavy g. coral - dry</u>	<u>125'</u>	<u>125'</u>	<u>220' ft.</u> <u>4-19-69</u>		
<u>fine sand</u>	<u>50'</u>	<u>175'</u>	5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dig		
<u>dry</u>	<u>30'</u>	<u>205'</u>	☐ Hollow rod ☐ Jammed ☐ Bored ☐		
<u>Parse water bearing sand</u>	<u>15'</u>	<u>220'</u>	6 USE: ☒ Domestic ☐ Public Supply ☐ Industry		
			☐ Irrigation ☐ Air Conditioning ☐ Commercial		
			☐ Test Well ☐		
			7 CASING: Threaded ☐ Welded ☒ Height: Above/Below surface <u>1</u> ft.		
			Dip: <u>2</u> in. to <u>2 1/4</u> ft. Depth Weight <u>12</u> lbs/ft.		
			Drive Shop? Yes ☒ No ☐		
			8 SCREEN: Type <u>Stainless</u> Dia. <u>3"</u>		
			Slot/Gauge <u>010</u> Length <u>4'</u>		
			Set between <u>216</u> ft. and <u>220</u> ft.		
			Fittings: <u>3" x 1 1/2" nipple</u>		
			<u>NCOPR402 per Kap.</u>		
			9 STATIC WATER LEVEL <u>100</u> ft. below land surface		
			10 PUMPING LEVEL below land surface <u>147</u> ft. after <u>5</u> hrs. pumping <u>20</u> g.p.m.		
			_____ ft. after _____ hrs. pumping _____ g.p.m.		
			11 WATER QUALITY in Parts Per Million: _____		
			Iron (Fe) _____ Chlorides (Cl) _____		
			Hardness _____		
			12 WELL HEAD COMPLETION: ☐ In Approved Pit		
			☒ Pitless Adapter ☒ 12" Above Grade		
			13 GROUTING: _____		
			Well Grouted? ☐ Yes ☐ No		
			Material: ☐ Mortar Cement ☐ _____		
			Depth: From _____ ft. to _____ ft.		
			14 SANITARY: <u>NO REPORT time of drilling</u>		
			Nearest Source of possible contamination _____		
			_____ feet _____ Direction _____ Type _____		
			Well disinfected upon completion ☐ Yes ☐ No		
			15 PUMP: Manufacturer's Name <u>Meyers</u>		
			Model Number <u>SD100-21</u> HP <u>1</u>		
			Length of Drop Pipe <u>47</u> ft. capacity <u>15</u> g.p.m.		
			Type: ☒ Submersible ☐ _____		
			☐ Jet ☐ Reciprocating		
16 Remarks, elevation, source of data, etc.			17 WATER WELL CONTRACTOR'S CERTIFICATION:		
ADDED INFO. BY DRILLER. ITEM NO. _____			This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.		
CORRECTED BY: _____			<u>Metamora Well Drilling</u> <u>0397</u>		
CORRECTION BY: _____			REGISTERED BUSINESS NAME		
			Address <u>3175 S. Lapeer</u> <u>M. to. to. to.</u>		
			Signed <u>Lawrence D. Kunkin</u> Date <u>5-2-69</u>		
			AUTHORIZED REPRESENTATIVE		

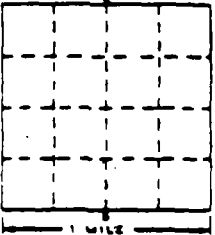
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WATER WELL RECORD

ACT 254 PA 1968

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

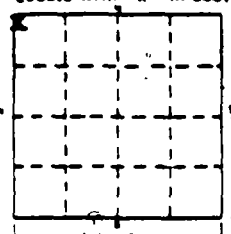
15-25

1 LOCATION OF WELL		TOWNSHIP NAME		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
County <u>Lapeer</u>		Township Name <u>Metamora</u>		Section Number <u>15</u>		Town Number <u>6</u>		Range Number <u>10</u>	
Distance and Direction from Road Intersections <u>1 Mile E. of Blood Rd</u> <u>150' N. of Center St.</u>					3 OWNER OF WELL: <u>Richard Jackson</u>				
Street address & City of Well Location Locality with "X" in section below					4 WELL DATA: (Completed) Date of Completion <u>195</u> n. <u>9-29-72</u>				
					5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig				
					6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well				
7 CASING: Threaded ☒ Welded ☐ Height: Above Surface Dia. <u>4</u> in. to <u>191</u> ft. Depth <u>11</u> lbs./ft.					8 SCREEN: Type: <u>Stainless</u> Dia. <u>3"</u> Size: <u>20/30</u> Length <u>4'</u> Set between <u>0</u> ft. and <u>191</u> ft. Fittings: <u>3 1/2" nipple</u> <u>neoprene packer</u>				
2 FORMATION					9 STATIC WATER LEVEL <u>130</u> ft. below land surface				
THICKNESS OF STRATUM					10 PUMPING LEVEL below land surface <u>190</u> ft. after <u>4</u> hrs. pumping <u>15</u>				
DEPTH TO BOTTOM OF STRATUM					11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____				
<u>Clay</u>					12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pileless Adapter ☒ 12" Above Grade				
<u>Gravel</u>					13 Well Grouted? ☒ Yes ☐ No ☐ Heat Cement ☐ Benzoinite ☒ Aggr. Grt Depth: From _____ ft. to _____ ft.				
<u>Clay</u>					14 Nearest Source of possible contamination <u>75</u> feet <u>N</u> Direction <u>Septic</u> Type _____ Well disinfected upon completion ☐ Yes ☐ No				
<u>Gravelly clay</u>					15 PUMP: ☐ Not installed Manufacturer's Name <u>Red Jacket</u> Model Number <u>A75011200</u> Volts <u>220</u> Length of Drop Pipe <u>62</u> ft. capacity <u>10</u> G.P.M. Type: ☒ Submersible ☐ Jet ☐ Recirculating				
<u>Gravel</u>					16 Remarks, elevation, source of data, etc. ADDED BY: <u>J</u> CORRECTED BY: <u>J</u> COMPLETION BY: <u>J</u>				
					17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true <u>Metamora Well Drilling</u> 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>1640 Hendrie, Metamora</u> Signed <u>Jameson D. Hunk</u> Date <u>9-29-72</u> AUTHORITIES REPRESENTATIVE				

DEC 8 - 1977

WATER WELL RECORD
ACT 204 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-26

1 LOCATION OF WELL		Township Name		Fraction	Section Number	Town Number	Range Number
Capeer		Metamora		NW x NW (NW)	15	6 N.E.	10 E.
Distance And Direction from Road Intersections 1 block E. of Blood Rd., 150' S. of Dryden Rd., Street address & City of Well Location				3 OWNER OF WELL: Arlin Obernair Address			
Locate with "X" in section below Sketch Map: 				4 WELL DEPTH: (combined) Date of Completion 380 ft. 9-9-77			
2 FORMATION				5 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well			
				6 CASING: Threaded ☒ Welded ☐ Height: Above/Below - Diam. 4 in. to 294 ft. Depth Surface 1 ft. Weight 11 lbs./ft. Drive Shoe? Yes ☐ No ☐			
THICKNESS OF STRATUM				8 SCREEN:			
DEPTH TO BOTTOM OF STRATUM				Type: _____ Dia: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____			
Clay				9 STATIC WATER LEVEL			
25				120 ft. below land surface			
Dry gravel				10 PUMPING LEVEL below land surface			
269				200 ft. after 3 hrs. pumping 20 S.P.M.			
Sandstone				11 WATER QUALITY in Parts Per Million			
86				Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____			
380				12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade			
				13 Well Grouted ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ SDG Depth: From 0 ft. to 294 ft.			
				14 nearest Source of possible contamination none			
				Well disinfected upon completion ☒ Yes ☐ No			
				15 PUMP: ☒ Not installed			
				Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: ☐ Submersible ☐ Jet ☐ Reciprocating			
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ETC. CORRECTED BY ELEVATION DEPTH TO ROCK				17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. METAMORA WELL DRILLING Address 1200 Inlay City Rd., Capeer Signed _____ Date 10-24-77 AUTHORISED REPRESENTATIVE			

USE A 2ND SHEET IF NEEDED

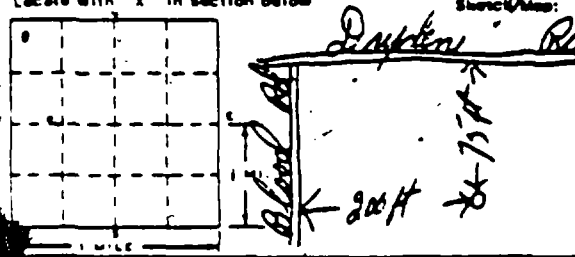
GEOLOGICAL SURVEY SAMPLE NO. 

WATER WELL RECORD

ACT 284 PA 1968

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-27

1 LOCATION OF WELL			3 OWNER OF WELL:		
County <u>Lapeer</u>	Township Name <u>Metamora</u>	Fraction <u>NW 1/4 NW 1/4</u>	Section Number <u>15</u>	Town Number <u>6 N/2</u>	Range Number <u>10 E/4</u>
Distance and Direction from Road Intersections <u>200 ft. E of Clark Rd., 75 ft. S. of Ogden Rd.</u>			Address [REDACTED]		
Street address & City of Well Location <u>Drayton Rd. Drayton, MI</u>			4 WELL DEPTH: (Completed) DATE OF COMPLETION <u>300 ft. 12-10-73</u>		
			5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jetted ☐ Bored ☐		
			6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐		
FORMATION			7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Diam. <u>4 in. to 2 1/2 in.</u> Depth <u>283 ft.</u> Surface <u>1 ft.</u> Weight <u>11 lbs/ft.</u> Drive Shoe? Yes ☒ No ☐		
THICKNESS OF STRATUM			8 SCREEN:		
DEPTH TO BOTTOM OF STRATUM			Type: _____ Dia.: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Pittings: _____		
<u>Hardy surface soil</u>			9 STATIC WATER LEVEL		
<u>gravel</u>			<u>128 ft. below land surface</u>		
<u>hard rock</u>			10 PUMPING LEVEL below land surface		
			_____ ft. after _____ hrs. pumping <u>50</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.		
			11 WATER QUALITY in Parts Per Million:		
			Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____		
			12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Adapter ☐ 12" Above Grade		
			13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☒ Bentonite ☐ _____ Depth: From _____ ft. to _____ ft.		
			14 Nearest Source of possible contamination		
			<u>50 feet S Direction Drayton</u> Type _____ Well disinfected upon completion ☒ Yes ☐ No		
			15 PUMP: ☒ Not installed		
			Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: ☐ Submersible ☐ Jet ☐ Reciprocating		
16 Remarks, elevation, source of data, etc.			17 WATER WELL CONTRACTOR'S CERTIFICATION:		
ADDED INFO BY DRILLER, ITEM NO. _____ *CORRECTED BY <u>[Signature]</u> **ADDITION BY <u>[Signature]</u> ELEVATION <u>1100</u> DEPTH TO ROCK _____			This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Taylor & Hill Drilling</u> REGISTRATION NO. <u>1194</u> Address <u>4155 W. Dodge Rd. Warren, Mich</u> Signed <u>[Signature]</u> Date <u>12-23-73</u> AUTHORIZED REPRESENTATIVE		

987d

100M (Rev. 12-68)

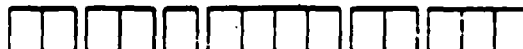
GEOLOGICAL SURVEY COPY

SEP 07 1973

WATER WELL RECORD
ACT 284 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1523

1 LOCATION OF WELL		TOWNSHIP NAME		RANGE		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
Lapeer		Metamora		NE 15		15		6 N.W.		10 E.W.	
2 DISTANCE AND DIRECTION FROM ROAD INTERSECTIONS						3 OWNER OF WELL					
1/2 M. E. of Blood Rd.						Russell Parrish					
75' S. of Dryden Rd.						Address					
Sketch Map:						4 WELL DEPTH: (completed) Date of Completion					
						415 n. 8-8-73					
5 ☐ Casing tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Juted ☐ Bored ☐						6 USE: ☒ Domestic ☐ Public Supply ☐ Industry					
						☐ Irrigation ☒ Air Conditioning ☐ Commercial					
						☐ Test Well ☐ Other					
7 CASING: Threaded ☒ Welded ☐ Height: Above/Below						Surface 1 ft.					
4 in. to 346 ft. Depth						Weight 11 lbs./ft.					
8 SCREEN:						Drive Shoe? yes ☐ no ☐					
Type: _____ Dia: _____						Siz/Gauge _____ Length _____					
Set between _____ ft. and _____ ft.						Fittings: _____					
9 STATIC WATER LEVEL:						130 ft. below land surface					
10 PUMPING LEVEL below land surface						210 ft. after 1 hrs. pumping 20 g.p.m.					
_____ ft. after _____ hrs. pumping _____ g.p.m.						11 WATER QUALITY in Parts Per Million:					
Iron (Fe) _____ Chlorides (Cl) _____						Hardness _____ Other _____					
12 WELL HEAD COMPLETION:						In Approved Pit					
Capped ☒ Pileless Adapter ☒ 12" Above Ground						13 Well Grouted? ☒ Yes ☐ No					
☐ Neat Cement ☐ Bentonite ☒ Aqua Gel						Depth: From 0 ft. to 346 ft.					
14 Nearest Source of possible contamination						80 feet SE Direction Septic Tank					
Well disinfected upon completion ☒ Yes ☐ No						15 PUMP:					
☐ Not installed						Manufacturer's Name Red Jacket					
Model No. 15BC HP 1 Vert 220						Length of Drop Pipe 210 ft. capacity 100 g.p.m.					
Type: ☒ Submersible ☐ Jet ☐ Reciprocating						16 Remarks, elevation, source of data, etc.					
Elev ~ 1130'						17 WATER WELL CONTRACTOR'S CERTIFICATION:					
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.						Metamora Well Drilling 0367					
Address 1200 Inlay City Rd. Lapeer						Signed _____ Date 8-8-73					



FEB 01 1971

WATER WELL RECORD

ACT 294 PA 1966

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

15-29

1 LOCATION OF WELL

County

Lapeer

Township Name

Metamora

Fraction

1/4 1/4 1/4 1/4

Section Number (Town Number)

15

6 N.E.

Range Number

10 E.

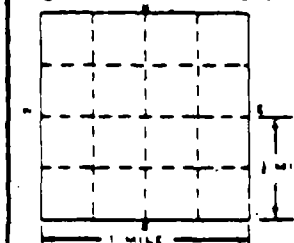
Distance And Direction from Road Intersections

Dryden Rd.
Metamora, Mich.

Street address & City of Well Location

Locate with "X" in section below

Sketch map:



2 FORMATION

THICKNESS
OF
STRATUMDEPTH TO
BOTTOM OF
STRATUM

Gravel

187

187

3 OWNER OF WELL:

Ronald Herring

Address

4 WELL DEPTH: (Completed) Date of Completion

187

6/20/69

Cable tool

Hollow rod

Rotary

Jotted

Driven

Bored

Dig

5 USE:

Domestic

Public Supply

Industry

Irrigation

Air Conditioning

Commercial

Test Well

7 CASING: Threaded

Welded

Height: Above/Below

Diam.

4 in. to

178 ft. Depth

Surface 1 ft.

in. to

ft. Depth

Height 11.00 lbs./ft.

Drive Shoe? Yes ☒ No ☐

8 SCREEN:

Type:

Dia.:

Slot/Gauge

Length

Set between

ft. and

ft.

Fittings:

9 STATIC WATER LEVEL

100

ft. below land surface

10 PUMPING LEVEL below land surface

ft. stand

hrs. pumping

18

g.p.m.

ft. after

hrs. pumping

g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe)

Chloride (Cl)

Hardness

Other

12 WELL HEAD COMPLETION:

☐ In Approved Pit☒ Pitless Adapter☐ 12" Above Grade13 Well Grouted? ☒ Yes ☐ No☒ Near Center☐ Somewhat☐ Far

Depth: From

127

ft. to

178

ft.

14 Nearest Source of possible contamination

24' test

P

Direction

Septic

Type

Well disinfected upon completion

☒ Yes ☐ No

15 PUMP:

☐ Not installed

Manufacturer's Name

KAWAYTON

Model Number

107215

HP

1

Volts

240

Length of Drop Pipe

102

ft. capacity

15

g.p.m.

Type:

☒ Submersible☐ Jet☐ Recirculating

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

ADD

CORRECTOR ITEM NO.

CORRECTED BY:

EDITION BY:

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Burns Well Drilling

0099

REGISTERED BUSINESS NAME

REGISTRATION NO.

Address 5370 Corona Rd., Flint, Mich.

Signed

Date

8/25/69

AUTHORIZED REPRESENTATIVE

WATER WELL AND PUMP RECORD

PART 127 ACT 368 P.A. 1978

PERMIT NUMBER 16-1

1 LOCATION OF WELL		Section Number		Town Number		Range Number	
County <u>LAPPEL</u> Township Name <u>WETAMORA</u>		16		5 N 2		10 E W	
Distance and Direction from Ross Intersection		3 OWNER OF WELL					
Street Address & City of Well Location		Address <u>WALLACE CLARK</u>					
Locate with 'X' in Section Below		4 WELL DEPTH (completed) <u>298</u> ft Date of Completion <u>9/13/84</u>					
Sketch Map		5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ dug ☐ Hollow rod ☐ Auger ☐ Jarred ☐					
1 MILE		6 USE ☒ Domestic ☐ Type I Public ☐ Type II Public ☐ Irrigation ☐ Type III Public ☐ Heat pump ☐ Test Well ☐ Type IV Public					
2 FORMATION DESCRIPTION		7 CASING Diameter: ☐ Steel ☒ Plastic ☐ Threaded ☐ Welded <u>5</u> in to <u>237</u> ft depth Surface <u> </u> ft <u>3/4</u> in to <u>298</u> ft depth Weight <u> </u> lbs/ft Ground Drill Hole Diameter <u>3/4</u> in to <u>237</u> ft depth Drive Shoe ☐ Yes ☒ No <u>3/4</u> in to <u>298</u> ft depth					
THICKNESS OF STRATUM		8 SCREEN ☒ Not installed					
DEPTH TO BOTTOM OF STRATUM		Type <u> </u> Diameter <u> </u> Slot/Gauge <u> </u> Length <u> </u> Set between <u> </u> ft and <u> </u> ft FITTINGS ☐ K-Packer ☐ Lead Packer ☐ Bottom Check ☐ Blank above screen <u> </u> ft Other <u> </u>					
<u>red sandy clay</u>		9 STATIC WATER LEVEL <u>75</u> ft below land surface ☐ None					
<u>gravel</u>		10 PUMPING LEVEL below land surface					
<u>sandy red clayed gravel</u>		<u>298</u> ft other <u>1 1/2</u> hrs pumping at <u>60</u> GPM with air <u> </u> ft other <u> </u> hrs pumping at <u> </u> GPM					
<u>hard silty gravel</u>		11 WELL HEAD COMPLETION ☐ Flush discharge ☐ 12" above grade ☐ Basement offset ☐ Approved D-1					
<u>hard gravel</u>		12 WELL GROUTED? ☐ No ☒ Yes From <u>0</u> to <u>237</u> ft					
<u>clayed gravel</u>		☐ Neat cement ☒ Bentonite ☐ Other <u> </u>					
<u>sandstone & sandy shale layers</u>		No. of bags of cement <u> </u> Additives <u> </u>					
		13 NEAREST SOURCE OF POSSIBLE CONTAMINATION					
		Type <u>septic</u> Distance <u>50</u> ft Direction <u>E</u>					
		Well disinfected upon completion? ☐ Yes ☒ No					
		14 PUMP ☐ Not installed ☐ Pump installation only					
		Manufacturer's name <u>Red 100-04</u>					
		Model number <u>500707550</u> VARS <u>220</u>					
		Length of Drop Pipe <u>105</u> ft Capacity <u>10</u> GPM					
		TYPE ☐ Submersible ☐ Jet					
		PRESSURE TANK					
		Manufacturer's name <u>Well X-101</u>					
		Model number <u>060</u> Capacity <u> </u> GPM					
15 Remarks elevation source of data etc		16 WATER WELL CONTRACTOR'S CERTIFICATION					
		This work was done under my jurisdiction and this report is true to the best of my knowledge and belief					
		JAMES C. WILCOX, WELL DRILLING 44-0125					
		Address <u>700 N. Lapsee St. Columbus, MI</u>					
		Signed <u>James C. Wilcox</u> Date <u>9/23/84</u>					

MAR 01 1974

WATER WELL RECORD

ACT 284

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

16-2

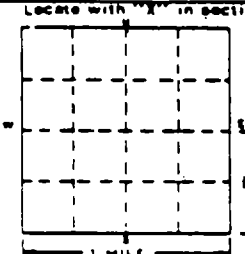
1 LOCATION OF WELL		TOWNSHIP NAME		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
Lapeer		Metamora		(Village)		16		.6 N.E. 10 E.W.	
Distance and Direction from Road Intersections				3 OWNER OF WELL					
500' N of Oak St.				Michael Burke					
15' W. of School St.				Address					
Street address & City of Well Location				4160 School St., Metamora					
Locate with 1" in section below				4 WELL DEPTH: (Completed) Date of Completion					
Sketch Map:				260 ft. 1-24-74					
				5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug					
				☐ Hollow rod ☐ Jarrod ☐ Bored ☐					
				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry					
				☐ Irrigation ☐ Air Conditioning ☐ Commercial					
				☐ Test Well ☐					
				7 CASING: Threaded ☒ Welded ☐ Height: Above/Surface					
				Diam. 4 in. to 220 ft. Depth 11 in. to 11 ft.					
				Weight 11 lbs./ft. Drive Shoe? Yes ☒ No ☐					
2 FORMATION				THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM			
Dry-gravel				60		60			
Clay				160		220			
Sandstone				40		260			
						8 SCREEN:			
						Type: _____ Dia: _____			
						Size/Gauge _____ Length _____			
						Set between _____ ft. and _____ ft.			
						Fittings: _____			
						9 STATIC WATER LEVEL			
						100 ft. below land surface			
						10 PUMPING LEVEL below land surface			
						120 ft. after 1 hrs. pumping 50 g.p.m.			
						ft. after _____ hrs. pumping _____ g.p.m.			
						11 WATER QUALITY in Parts Per Million: _____			
						Iron (Fe) _____ Chlorides (Cl) _____			
						Hardness _____ Other _____			
						12 WELL HEAD COMPLETION: ☐ In Approved Pit			
						☒ Pitless Adapter ☒ 12" Above Grade			
						13 Well Grouted? ☒ Yes ☐ No			
						☐ Near Cement ☐ Bentonite ☒ SDSG			
						Depth: From 0 ft. to 220 ft.			
						14 nearest Source of possible contamination			
						60 feet E Direction Septic Type			
						Well disinfected upon completion ☒ Yes ☐ No			
						15 PUMP: ☐ Not Installed			
						Manufacturer's Name Red Jacket			
						Model Number R5011 9BC HP 9 Volts 220			
						Length of Drop Pipe 8 ft. capacity 10 g.p.m.			
						Type: ☒ Submersible			
						☐ Jet ☐ Recirculating			
16 Remarks, elevation, source of data, etc.				17 WATER WELL CONTRACTOR'S CERTIFICATION:					
ELEVATION				This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.					
DEPTH TO ROCK				Metamora Well Drilling 0367					
				REGISTERED BUSINESS NAME					
				Address 1200 Imley City Ed., Lapeer					
				Signed Tracy Helen Kurik Date 1-29-74					
				AUTHORIZED REPRESENTATIVE					

JUN - 9 1976

WATER WELL RECORD

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

16-3

1 LOCATION OF WELL		METATHURCKA PA 1906		Section Number 16		Town Number 6 N/S		Range Number 10 E/S	
County <u>Wayne</u>		Township Name <u>Eastland</u>		Fraction <u>1/4</u>					
Distance And Direction from Road Intersection <u>1/4 mi. E on Thomas St from</u> <u>N 24 on E. side</u>				5 OWNER OF WELL: Address <u>Shank Building Inc</u> <u>505 No Leroy St</u> <u>Detroit Mich</u>					
Street address & City of Well Location <u>635 Lake St</u>				4 WELL DEPTH: (completed) Date of Completion <u>80</u> ft. <u>11-20-75</u>					
Locate with "X" in section below				5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jetted ☐ Bored ☐					
Sketch Map: 				6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐					
2 FORMATION				THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		7 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface <u>1</u> ft. Weight <u>3.25</u> lbs./ft. Drive Shoe? Yes ☐ No ☐	
<u>Clay & sand</u>				<u>20</u>		<u>20</u>		8 SCREEN: Type: <u>Houston Shovel</u> Dia.: <u>1 1/4"</u> Size/Gauge <u>2</u> Length <u>4'</u> Set between <u>26</u> ft. and <u>60</u> ft. Fittings: <u>section pipe on screen</u> <u>sealed with thick valve</u>	
<u>Gravel some clay</u>				<u>40</u>		<u>60</u>		9 STATIC WATER LEVEL <u>40</u> ft. below land surface	
<u>Blue Clay</u>				<u>8</u>		<u>68</u>		10 PUMPING LEVEL below land surface <u>4'</u> ft. above <u>2</u> hrs. pumping <u>?</u> g.p.m. <u>with rig</u> ft. after <u>2</u> hrs. pumping <u>?</u> g.p.m.	
<u>Water Channel</u>				<u>12</u>		<u>80</u>		11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____	
								12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade	
								13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Grout ☒ Gravel Head Depth: From _____ ft. to _____ ft.	
								14 Nearest Source of possible contamination <u>55</u> feet <u>SE</u> Direction <u>Septic</u> Type Well disinfected upon completion ☒ Yes ☐ No	
								15 PUMP: ☐ Not installed Manufacturer's Name <u>Grundfos</u> Model Number <u>2703</u> Horse Power <u>1/2</u> Length of Drop Pipe <u>20</u> ft. capacity <u>8</u> G.P.M. Type: ☐ Submersible ☒ Jet ☐ Reciprocating	
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. *CORRECTED BY **ADDITION BY ELEVATION DEPTH TO ROCK				12 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Gregory M. Lusk</u> CC 23 REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>15390 Riverchase Shores Holly Mich</u> Signed <u>Gregory M. Lusk</u> Date <u>11-20-75</u> AUTHORIZED REPRESENTATIVE					

JUN 04 1973

WATER WELL RECORD

ACT 234 PA 1968

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

16-4

1 LOCATION OF WELL		TOWNSHIP NAME		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
County: <u>Lapeer</u>		<u>Metamora</u>		<u>SE. 5N. 5E.</u>		<u>16</u>		<u>6 N4E</u>	
Distance and Direction from Road Intersections: <u>3/8 m. W. of Blood Rd.</u> <u>1 m. S. of Deyden Rd.</u>		Street address & City of Well Location: <u>Brown Rd. Metamora</u>		3 OWNER OF WELL: <u>Larry Decees</u>		Address: <u>[REDACTED]</u>		4 WELL DEPTH: (completed) Date of Completion: <u>420 ft.</u> <u>5-11-73</u>	
Locate with "X" in section below: 		Sketch map:		5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jetted ☐ Bored ☐		6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐		7 CASING: Threaded ☒ Welded ☐ Height: Above surface Diam. <u>4 in.</u> to <u>327 ft.</u> Depth <u>11</u> lbs./ft. Weight <u>11</u> lbs./ft. Drive shoe? Yes ☒ No ☐	
2 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		8 SCREEN:		9 STATIC WATER LEVEL	
<u>Sand & Gravel</u>		<u>113</u>		<u>113</u>		Type: <u>—</u> Dia.: <u>—</u>		<u>150 ft. below land surface</u>	
<u>Clay</u>		<u>207</u>		<u>320</u>		Size/Gauge <u>—</u> Length <u>—</u>		10 PUMPING LEVEL below land surface <u>420 ft. after 2 hrs. pumping</u> <u>60</u> S.G.M.	
<u>Shale</u>		<u>60</u>		<u>380</u>		Set between <u>—</u> ft. and <u>—</u> ft.		<u>—</u> ft. after <u>—</u> hrs. pumping <u>—</u> S.G.M.	
<u>Sandstone</u>		<u>40</u>		<u>420</u>		Fittings: <u>—</u>		11 WATER QUALITY in Parts Per Million: Iron (Fe) <u>—</u> Chlorides (Cl) <u>—</u> Hardness <u>—</u> Other <u>—</u>	
						12 WELL HEAD COMPLETION: ☐ In Approved Pit ☐ Pitless Receptor ☒ 12" Above Grade		13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ <u>Agua Gel</u> Depth: From <u>—</u> ft. to <u>327 ft.</u>	
						14 Nearest Source of possible contamination <u>none</u> Foot <u>—</u> Direction <u>—</u> Type <u>—</u> Well disinfected upon completion ☒ Yes ☐ No		15 PUMP: ☒ Not installed Manufacturer's Name <u>—</u> Model Number <u>—</u> HP <u>—</u> Verts <u>—</u> Length of Drop Pipe <u>—</u> ft. capacity <u>—</u> G.P.M. Type: ☐ Submersible ☐ Jet ☐ Reciprocating	
16 Remarks, elevation, source of data, etc.						17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Metamora Well Drilling</u> 0297 REGISTERED BUSINESS NAME REGISTRATION NO. Address <u>4055 S. Oak St.</u> Signed <u>Donald Paul</u> Date <u>5-14-73</u> AUTHORIZED REPRESENTATIVE			

WATER WELL RECORD

ACT 204 PA 1988

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

16-5

1 LOCATION OF WELL		TOWNSHIP NAME		FRACTION		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
Lapeer		Metamora		50.25.50		16		6 N		10 E	
Distance and Direction from Road Intersections											
1/4 m. W. of Blood Rd.											
1 m. E. of Dryden Rd.											
Street address & City of Well Location											
[Redacted] Metamora											
Sketch Map:											
2 FORMATION				THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM					
Dry Gravel				145		145					
Clay				181		(326)					
Sandstone				74		400					
3 OWNER OF WELL:											
David Brown											
Address [Redacted]											
4 WELL DEPTH: (completed) Date of Completion											
400 ft. 4-6-73											
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig											
☐ Hollow rod ☐ Jotted ☐ Bored ☐ _____											
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry											
☐ Irrigation ☐ Air Conditioning ☐ Commercial											
☐ Test Well ☐ _____											
7 CASING: Threaded ☒ Welded ☐ Height: Above/Below											
Diam. _____ Surface _____ ft.											
4 in. to 326 ft. Depth Weight 11 lbs./ft.											
in. to _____ ft. Depth Drive Shaft? Yes ☒ No ☐											
8 SCREEN:											
Type: _____ Dia.: _____											
Slot/Gauge _____ Length _____											
Set between _____ ft. and _____ ft.											
Fittings: _____											
9 STATIC WATER LEVEL											
150 ft. below land surface											
10 PUMPING LEVEL below land surface											
400 ft. after 1 hrs. pumping 50 S.P.M.											
_____ ft. after _____ hrs. pumping _____ S.P.M.											
11 WATER QUALITY in Parts Per Million:											
Iron (Fe) _____ Chlorides (Cl) _____											
Hardness _____ Other _____											
12 WELL HEAD COMPLETION: ☐ In Approved Pit											
☐ Pitless Adapter ☒ 12" Above Grade											
13 Well Grouted? ☒ Yes ☐ No											
☐ Neat Cement ☐ Bentonite ☒ Aqua Seal											
Depth: From _____ ft. to 326 ft.											
14 Nearest Source of Possible Contamination											
20 feet SE Direction Septic Type											
Well disinfected upon completion ☒ Yes ☐ No											
15 PUMP: ☒ Not installed											
Manufacturer's Name _____											
Model Number _____ HP _____ Volts _____											
Length of Drop Pipe _____ ft. capacity _____ G.P.M.											
Type: ☐ Submersible ☐ Jet ☐ Reciprocating											
16 Remarks, elevation, source of data, etc.											
ADDED INFO. BY DALLER ITEM 12											
CORRECTED BY: [Signature]											
CONDITION [Signature]											
17 WATER WELL CONTRACTOR'S CERTIFICATION:											
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.											
Metamora Well Drilling 2292											
REGISTERED BUSINESS NAME REGISTRATION NO.											
Address 1640 Hendrix Metamora											
Signed [Signature] Date 4-6-73											
AUTHORIZED REPRESENTATIVE											

USE A 2ND SHEET IF NEEDED

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

16-6

1 LOCATION OF WELL		County <u>Lapeer</u>		Town <u>Metamora</u>		Range <u>10 E</u>	
Street address & City of Well Location		W. High St. Metamora, Mich.		3 OWNER OF WELL:		Owner <u>Mr. Anne Smith</u>	
2 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		4 WELL DEPTH (feet) <u>130</u> h. <u>9-5-69</u>	
Clay		20'		30'		5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug	
gravel + sand		70'		100'		6 USE: ☒ Domestic ☐ Public Supply ☐ Industry	
Water bearing gravel		30'		130'		☐ Irrigation ☐ Air Conditioning ☐ Commercial	
						7 CASING: Threaded ☒ Welded ☐ Height Above Ground <u>9</u> ft.	
						Diam. <u>4</u> in. to <u>12 1/2</u> in. Depth <u>11</u> ft.	
						Weight <u>11</u> lbs./ft. Drive Shop? Yes ☒ No ☐	
						8 SCREEN: Type <u>Stainless</u> Dia. <u>3"</u>	
						Slot/Screen <u>018</u> Length <u>4'</u>	
						Set between <u>126</u> ft. and <u>130</u> ft.	
						Pinnings: <u>3" x 18" Nipple</u>	
						Pinnings: <u>NECPCOR packer</u>	
						9 STATIC WATER LEVEL <u>h. below land surface</u>	
						10 PUMPING LEVEL below land surface <u>100</u> ft. after <u>5</u> hrs. pumping <u>g.p.m.</u>	
						<u>h. after</u> <u>hrs.</u> pumping <u>g.p.m.</u>	
						11 WATER QUALITY in Parts Per Million: Iron (Fe) <u>—</u> Chlorides (Cl) <u>—</u>	
						Hardness <u>—</u>	
						12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade	
						13 GROUTING: Well Grouted? ☒ Yes ☐ No	
						Material: ☐ Mortar Cement ☒ <u>Aggreg</u>	
						Depth: From <u>0</u> ft. to <u>126</u> ft.	
						14 SANITARY: Nearest Source of possible contamination <u>50</u> feet <u>WW</u> Direction <u>S 1/2 E</u> Type <u>Septic</u>	
						Well disinfected upon completion ☐ Yes ☒ No	
						15 PUMP: Manufacturer's Name <u>Meyers</u>	
						Model Number <u>SE 5-21</u> HP <u>1/2</u>	
						Length of Drop Pipe <u>105</u> ft. capacity <u>150</u> P.M.	
						Type: ☒ Submersible ☐ <u>Jet</u> ☐ Root-protecting	
16 Remarks, elevation, source of data, etc.		17 WATER WELL CONTRACTOR'S CERTIFICATION:					
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.		Metamora Well Drilling 0397					
REGISTERED BY <u>Metamora Well Drilling</u>		REGISTERED BUSINESS NAME					
ADDRESS <u>3875 S Lapeer Metamora</u>		ADDRESS					
SIGNATURE <u>Charlton A. Smith</u> Date <u>9-17-69</u>		SIGNATURE					
AUTHORIZED REPRESENTATIVE		AUTHORIZED REPRESENTATIVE					

WATER WELL RECORD

ACT 294 PA 1963

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

16-7

1 LOCATION OF WELL			3 OWNER OF WELL:		
County <u>Lapeer</u>	Twp. <u>Metamora</u>	Section No. <u>16</u>	OWNER OF WELL: <u>Star Oil Co., Inc.</u> Address <u>2529 Lapeer Rd</u> <u>East Huron Mich.</u>		
Precinct <u>NE & NW NE</u> Range <u>6 NE</u> <u>10 E</u>			Street address & City of Well Location <u>4003 S Oak St.</u>		
2 FORMATION			4 WELL DEPTH (completed) <u>344</u> ft. Date of Completion <u>4-2-68</u>		
Clay, gravel & sand	THICKNESS OF STRATUM <u>60'</u>	DEPTH TO BOTTOM OF STRATUM <u>60'</u>	5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jammed ☐ Bored ☐		
Blue clay	<u>110'</u>	<u>170'</u>	6 USE: ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☒ Commercial ☐ Test Well ☐		
Clay, gravel & sand	<u>40'</u>	<u>210'</u>	7 CASING: Threaded ☒ Welded ☐ Diam. <u>4"</u> in. to <u>2 1/2"</u> ft. Depth <u>1</u> ft. <u>45'</u> in. to <u>275'</u> ft. Depth <u>11</u> lbs./ft. Drive Ships? Yes ☒ No ☐		
Shale - gray	<u>45'</u>	<u>275'</u>	8 SCREEN: Type _____ Dia. _____ Size/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____		
White sandstone	<u>39'</u>	<u>314'</u>	9 STATIC WATER LEVEL <u>70</u> ft. below land surface		
			10 PUMPING LEVEL below land surface <u>1:15</u> h. after <u>5</u> hrs. pumping <u>40</u> g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.		
			11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____		
			12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade		
			13 GROUTING: Well Grouted? ☒ Yes ☐ No Material: ☐ Neat Cement ☒ Grout Depth: From <u>0</u> ft. to <u>30</u> ft.		
			14 SANITARY: Nearest Source of possible contamination <u>90</u> feet <u>NE</u> Direction <u>Sediment</u> type Well disinfected upon completion ☐ Yes ☒ No		
			15 PUMP: Manufacturer's Name <u>Red Jacket</u> Model Number <u>MR-1</u> <u>1/2</u> h.p. capacity <u>10</u> g.p.m. Type ☒ Submersible ☐ _____ ☐ Jet ☐ Reciprocating		
16 Remarks, elevation, source of data, etc. ADDED INFO. BY DRILLER, ITEM NO. CORRECTED BY: REVISION BY:			17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. <u>Metamora Well Drilling</u> REGISTERED BUSINESS NAME Address <u>275 S Lapeer Rd - Metamora</u> Signed <u>Hamilton Lusk</u> <u>4-2-68</u> AUTHORIZED REPRESENTATIVE		

ACT 204 PA 1949

41

SEP 17 1973

WATER WELL RECORD
ACT 204 PA 1966MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

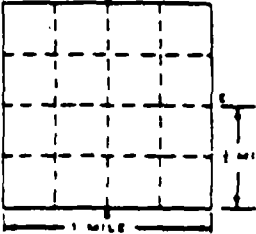
16-9

1 LOCATION OF WELL		TOWNSHIP NAME		FRACTION		SECTION NUMBER		TOWN NUMBER		RANGE NUMBER	
Lapeer		Metamora		NW 4 NW 4 SE 4		16		6 N 4		10 E 4	
2 AND DIRECTION FROM ROAD INTERSECTIONS											
1/2 M. E. of Metamora Rd.											
2 M. N. of Colson Rd.											
Street Address & City of Well Location											
T. Brown Dr., Metamora											
Locate with "X" in section below											
Sketch Map:											
3 OWNER OF WELL											
Marla Brooking											
Address											
[Redacted Address]											
4 WELL DEPTH: (completed) Date of Completion											
300 ft. 8-17-73											
5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug											
☐ Hollow rod ☐ Jailed ☐ Bored ☐											
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry											
☐ Irrigation ☐ Air Conditioning ☐ Commercial											
☐ Test Well ☐											
7 CASING: Threaded ☒ Welded ☐ Height: Above/Below											
4 in. to 241 ft. Depth Surface 1 ft.											
Weight 11 lbs./ft.											
Drive Shoes? Yes ☒ No ☐											
8 SCREEN: -----											
Type: ----- Dia.: -----											
Slot/Gauge ----- Length -----											
Set between ----- ft. and ----- ft.											
Fittings: -----											
9 STATIC WATER LEVEL											
50 ft. below land surface											
10 PUMPING LEVEL below land surface											
105 ft. after 1 hrs. pumping 50 g.p.m.											
----- ft. after ----- hrs. pumping ----- g.p.m.											
11 WATER QUALITY in Parts Per Million: -----											
Iron (Fe) ----- Chlorides (Cl) -----											
Hardness ----- Other -----											
12 WELL HEAD COMPLETION: ☐ In Approved Pit											
☒ Buried tank 12" Above Grade											
13 Well Grouted? ☒ Yes ☐ No											
☐ Heat Cement ☐ Bentonite ☒ SDG											
Depth: From 0 ft. to 241 ft.											
14 Nearest Source of possible contamination none											
----- feet ----- Direction ----- Type											
Well disinfected upon completion ☐ Yes ☐ No											
15 PUMP: ☐ Not installed											
Manufacturer's Name Red Jacket											
Model Number R50M1 GBC HP 1/2 Vols 220											
Length of Drive Pipe 105 ft. capacity 1.8 P.M.											
Type: ☒ Submersible											
☐ Jet ☐ Reciprocating											
16 Remarks, elevation, source of data, etc.											
17 WATER WELL CONTRACTOR'S CERTIFICATION:											
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.											
Metamora Well Drilling 0397											
REGISTERED BUSINESS NAME REGISTRATION NO.											
Address 1200 Inley City Rd., Lapeer											
Signed [Signature] Date 8-17-73											
AUTHORIZED REPRESENTATIVE											

JAN - 2 1976

WATER WELL RECORD
ACT 384 PA 1965MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

16-10

1 LOCATION OF WELL			3 OWNER OF WELL:		
County Lapeer	Township Name Metamora	Section (Village) NW 1/4	Section Number 216	Town Number 6 N.E.	Range Number 10 E.T.
Distance And Direction from Road Intersections 200' S. of Barrows St.			Address James J. Simpson, Sr.		
25' W. of School St.					
Street Address & City of Well Location School St., Metamora			4 WELL DEPTH: (Completed) Date of Completion 280 ft. 12-3-75		
Locate with "X" in section below 			5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig ☐ Hollow rod ☐ Jetted ☐ Bored		
			6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well		
			7 CASING: Threaded ☐ Welded ☐ Height: Above/Below Surface Diam. 4 in. to 232 ft. Depth Surface 1 ft. Weight 11 lbs./ft. Drive Shoe? Yes ☒ No ☐		
2 FORMATION			8 SCREEN: ☐ Type: ☐ Dia: ☐ Size/Gauge ☐ Length ☐ Set between ☐ ft. and ☐ ft. Fittings: ☐		
Clay	THICKNESS OF STRATUM 23	DEPTH TO BOTTOM OF STRATUM 23			
Clay & gravel mixed	16	39			
dry gravel	44	83			
Clay	149	232	9 STATIC WATER LEVEL 90 ft. below land surface		
Sandstone	48	280	10 PUMPING LEVEL below land surface 140 ft. after 2 hrs. pumping 30 g.p.m. ft. after ☐ hrs. pumping ☐ g.p.m.		
			11 WATER QUALITY in Parts Per Million: Iron (Fe) ☐ Chlorides (Cl) ☐ Hardness ☐ Other ☐		
			12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Plugless Adapter ☐ 12" Above Grade		
			13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Borrowed ☒ SDG Depth: From 0 ft. to 232 ft.		
			14 Nearest Source of possible contamination 55 feet W Direction Septic Type Well disinfected upon completion ☒ Yes ☐ No		
			15 PUMP: ☐ Not installed Manufacturer's Name Red Jacket Model Number B50N1-9BC No. 220 Length of Drive Pipe 147 ft. capacity 10 g.p.m. Type: ☒ Submersible ☐ Jet ☐ Recirculating		
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. CORRECTED BY ADDITION BY GJM ELEVATION DEPTH TO ROCK			17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora Well Drilling 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Inlay City Rd., Lapeer Signed Metamora Well Drilling Date 12-4-75 AUTHORIZED REPRESENTATIVE		

SEP 03 1975

WATER WELL RECORD

ACT 234 PA 1965

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

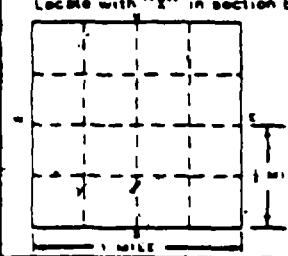
16-11

1 LOCATION OF WELL			3 OWNER OF WELL:		
County Lapeer	Township Name Metamora	Village ? Metamora	Section Number 16	Town Number 6	Range Number 29 E.N.
Distance And Direction from Road Intersections 1/2 M. E. of Metamora Rd. 150' S. of Brown Rd.			Address [REDACTED]		
Street address & City of Well Location Brown Rd.			4 WELL DEPTH: (completed) Date of Completion 360 ft. 8-15-75		
Locate with "X" in section below 			5 CASING: Threaded ☒ galvanized ☐ Height: Above/Surface Diam. 4 in. to 318 ft. Depth Surface 1 ft.		
2 FORMATION			6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐		
	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	7 CASING: Threaded ☒ galvanized ☐ Height: Above/Surface Diam. 4 in. to 318 ft. Depth Surface 1 ft.		
Sand	18	18	8 SCREEN: Type: _____ Dia: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____		
Dry gravel	95	113	9 STATIC WATER LEVEL 90 ft. below land surface		
Clay & Gravel	43	156	10 PUMPING LEVEL below land surface 120 ft. after 3 hrs. pumping 50 g.p.m.		
Clay & Stones	162	318	11 WATER QUALITY in Parts Per Million: _____ Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____		
Sandstone	42	360	12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade		
			13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ SDG Depth: From 0 ft. to 318 ft.		
			14 Nearest Source of possible contamination 100 feet SW Direction Septic Tank Type Well disinfected upon completion ☒ Yes ☐ No		
			15 PUMP: ☒ Not installed Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drop Pipe _____ ft. capacity _____ G.P.M. Type: ☐ Submersible ☐ Jet ☐ Reciprocating		
16 Remarks, elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. CORRECTED BY ADDITION BY G.M. ELEVATION DEPTH TO ROCK			17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora Well Drilling 0397 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Inlay City Rd., Lapeer Signed Harriet Kurek Date 8-15-75 AUTHORIZED REPRESENTATIVE		

WATER WELL RECORD

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

16-12

1 LOCATION OF WELL		TOWNSHIP NAME		(VILLAGE)		SECTION NUMBER		TOWNSHIP NUMBER		RANGE NUMBER	
County Lapeer		Metamora		(Village)		16		-6 N.E.		10 E.W.	
Distance And Direction from Road Intersections Village of Metamora, Hart's Plat Block 4, Lots 12 & 13						3 OWNER OF WELL Idea Center Construction Address 3830 Corunna Rd., Flint, Michigan					
Street address & City of Well Location Locate with "X" in section below Sketch Map:						4 WELL DEPTH: Completed Date of Completion 350 ft. 2-3-75					
 Village of Metamora						5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dig					
						6 ☐ Helide rod ☐ Jammed ☐ Bored ☐					
						6 USE: ☒ Domestic ☐ Public Supply ☐ Industry					
						☐ Irrigation ☐ Air Conditioning ☐ Commercial					
						7 CASING: Threaded ☒ Welded ☐ Diam. _____ Height: Above/Below Surface 1 ft. 4 in. to 295 ft. Depth Weight 11 lbs./ft. _____ in. to _____ ft. Depth Drive Shoe? Yes ☒ No ☐					
						8 SCREEN: _____ Type: _____ Dia.: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____					
2 FORMATION		THICKNESS OF STRATUM		DEPTH TO BOTTOM OF STRATUM		9 STATIC WATER LEVEL 130 ft. below land surface					
Dry gravel		40		40		10 PUMPING LEVEL below land surface 160 ft. after 1 hrs. pumping 50 g.p.m. _____ ft. after _____ hrs. pumping _____ g.p.m.					
Clay		90		130		11 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____					
Dry gravel		10		140		12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Plugless Adapter ☒ 12" Above Grade					
Clay & Boulders		155		295		13 Well Grouted? ☒ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☒ SDZ Depth: From 0 ft. to 295 ft.					
Sandstone		55		350		14 Nearest Source of possible contamination 75 feet W Direction Septic Type Well disinfected upon completion ☒ Yes ☐ No					
						15 PUMP: ☐ Not installed Manufacturer's Name Red Jacket Model Number R50N1 9BC Volts 220 Length of Drop Pipe 168 ft. capacity 10 g.p.m. Type: ☐ Submersible ☐ Jet ☐ Recirculating					
16 Remarks: elevation, source of data, etc. ADDED INFO BY DRILLER, ITEM NO. CORRECTED BY ADDITION BY <i>Grimm</i> ELEVATION DEPTH TO ROCK						17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. Metamora Well Drilling 0392 REGISTERED BUSINESS NAME REGISTRATION NO. Address 1200 Inlay City Rd., Lapeer Signed <i>Harry Helen Lusk</i> Date 2-10-75					

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WATER WELL RECORD
ACT 204 PA 1968MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

16-13

1 LOCATION OF WELL

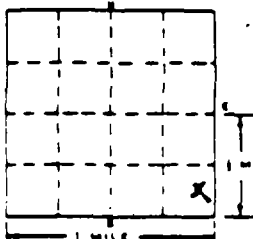
County Lapeer Township Name TAMORA Fraction N 8 1/4 Sec 4 Q 1/4 Section Number 16 Town Number 6 N 1/2 Range Number 10 E 1/2

Distance And Direction from Road Intersections

Street address & City of Well Location 8270

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL:

David Lamb

Address

4 WELL DEPTH: (completed) Date of Completion

318 ft. Oct. 1, 1979

5 ☐ Cable tool ☒ Rotary ☐ Driven ☐ Dug
☐ Hollow rod ☐ Jotted ☐ Bored ☐

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well

7 CASING: Threaded ☒ Welded ☐ Height: Above/Below
 Diam. 4 in. to 6 in. Surface 1 ft.

25 ft. Depth Weight 11 lbs./ft.
 Drive Shoe? Yes ☒ No ☐

8 SCREEN: ho

Type: _____ Dia.: _____
 Slot/Gauge _____ Length _____
 Set between _____ ft. and _____ ft.
 Filings: _____

9 STATIC WATER LEVEL:

104 ft. below land surface

10 PUMPING LEVEL below land surface

318 ft. after 2 hrs. pumping 60 S.P.M.
 with air
 _____ ft. after _____ hrs. pumping _____ S.P.M.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) _____ Chlorides (Cl) _____
 Hardness _____ Other _____

12 WELL HEAD COMPLETION: ☐ In Approved Pit
☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No
☐ Near Center ☐ Somewhere ☒ thick heavy mud
 Depth: From 0 ft. to 261 ft.

14 Nearest Source of possible contamination

_____ feet Direction no septic yet
 Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☐ Not installed

Manufacturer's Name JECUSKI
 Model Number 184C1492 HP 1 Vols 220
 Length of Drop Pipe 26 ft. collectively 20 G.P.M.
 Type: ☒ Submersible
☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

ADDED INFO BY MILLER, ITEM 2
 CORRECTED BY _____
 ADDITION BY G...
 ELEVATION _____
 DEPTH TO ROCK _____

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true
 to the best of my knowledge and belief.

JAMES C. WILCOX, JR. 44-0185
 REGISTERED BUSINESS NAME REGISTRATION NO.

Address 700 N. Lapeer St. Co. In-bienville, MI

Signed James C. Wilcox, Jr. 10/1/79
 AUTHORIZED REPRESENTATIVE

JUL 03 1979

WATER WELL RECORD

ACT 284 PA 1968

MICHIGAN DEPARTMENT
OF
PUBLIC HEALTH

1 LOCATION OF WELL		TOWNSHIP NAME		SECTION		RANGE NUMBER																
County: <u>Lapeer</u>		Township: <u>Metamora</u>		Section: <u>(Village of Metamora)</u>		Range: <u>14 N. 10 E.W.</u>																
Distance And Direction from Road Intersections				3 OWNER OF WELL:																		
<u>1/2 M. E. of Metamora Rd.</u>				Shuler Homes, Rudy Schuler																		
<u>35' W. of Colson-Rd.</u>				Address: <u>27 S. Washington</u>																		
Street address & City of Well Location <u>4469 Brown Rd</u>				Oxford, MI 48051																		
Locate with "X" in section below				4 WELL DEPTH: Is completed Date of Completion																		
				<u>355</u> ft. <u>6-13-79</u>																		
2 FORMATION <table border="1"> <thead> <tr> <th></th> <th>THICKNESS OF STRATUM</th> <th>DEPTH TO BOTTOM OF STRATUM</th> </tr> </thead> <tbody> <tr> <td>Gravel & clay</td> <td>180</td> <td>180</td> </tr> <tr> <td>Clay</td> <td>15</td> <td>195</td> </tr> <tr> <td>Dry gravel</td> <td>101</td> <td>296</td> </tr> <tr> <td>Sandstone</td> <td>59</td> <td>355</td> </tr> </tbody> </table>					THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	Gravel & clay	180	180	Clay	15	195	Dry gravel	101	296	Sandstone	59	355	5 CASING: Threaded ☒ Welded ☐ Height: Above/Below Surface <u>1</u> ft.			
					THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM																
Gravel & clay	180	180																				
Clay	15	195																				
Dry gravel	101	296																				
Sandstone	59	355																				
6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐																						
7 SCREEN: Type: _____ Dia.: _____ Slot/Gauge _____ Length _____ Set between _____ ft. and _____ ft. Fittings: _____				8 STATIC WATER LEVEL <u>160</u> ft. below land surface																		
9 PUMPING LEVEL-below land surface <u>220</u> ft. after <u>2</u> hrs. pumping <u>20</u> g.p.m.				10 WATER QUALITY in Parts Per Million: Iron (Fe) _____ Chlorides (Cl) _____ Hardness _____ Other _____																		
11 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade				12 Well Grouted? ☒ Yes ☐ No																		
13 Well Casing: ☐ Steel Casing ☐ Concrete ☒ <u>300</u> Depth: From <u>0</u> ft. to <u>300</u> ft.				14 Nearest Source of possible contamination: <u>none</u>																		
15 PUMP: ☒ Not Installed Manufacturer's Name _____ Model Number _____ HP _____ Volts _____ Length of Drive Pipe _____ ft. capacity _____ g.p.m. Type: ☐ Submersible ☐ Jet ☐ Reciprocating				16 Remarks, elevation, source of data, etc.																		
17 WATER WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief. REGISTERED BUSINESS NAME _____ REGISTRATION NO. _____ Address <u>1200 Inlay City Sp. - Searon</u> Signed _____ AUTHORIZED REPRESENTATIVE Date <u>7-1-79</u>				18 Remarks, elevation, source of data, etc.																		

APPENDIX D
ANALYTICAL LABORATORY DATA

E. J. ... CO.
 CHEMICAL ENGINEERS
 100 ... STREET
 P. O. BOX 7050 ... STATION
 PORTLAND, MAINE 04112
 (207) 775-5401 TELE 94-4329

REPORT OF ANALYSIS
 REFERENCE NUMBER 3126

DATE 9/25/65
 PAGE 1

STATE OF MICHIGAN
 DEPT. SERV. SECT. ATTOR. GENERAL
 ENVIRON. SERV. DIV. PO BOX 30028
 LANSING MI 48909

CLIENT	DATE RECEIVED /		UNITS	RESULTS
LAB ID	PARAMETER			
105	8/27/85			
5219003	ARSENIC, SOLUBLE	MG/L	(	0.000
	CADMIUM, SOLUBLE	MG/L	(	0.002
	CALCIUM, SOLUBLE	MG/L		120
	CHROMIUM, SOLUBLE	MG/L	(	0.005
	CHROMIUM, HEXAVALENT	MG/L	(	0.005
	COPPER, SOLUBLE	MG/L		0.025
	IRON, SOLUBLE	MG/L		0.048
	LEAD, SOLUBLE	MG/L	(	0.020
	MAGNESIUM, SOLUBLE	MG/L		36
	MERCURY, SOLUBLE	UG/L		1.0
	NICKEL, SOLUBLE	MG/L	(	0.020
	POTASSIUM, SOLUBLE	MG/L		1
	SELENIUM, SOLUBLE	MG/L	(	0.005
	SODIUM, SOLUBLE	MG/L		4.7
	ZINC, SOLUBLE	MG/L		1.1
	ALKALINITY, AS CaCO3	MG/L		150
	CHLORIDE	MG/L		12
	AMMONIA, AS N	MG/L		1
	NITROGEN, NITRATE, TOTAL	MG/L		1
	TOTAL PHOSPHORUS, AS P	MG/L		0.06
	SULFATE	MG/L		37
	OIL & GREASE, TOTAL RECOVERABLE	MG/L		20
	TOTAL ORGANIC CHLORINE, SOLUBLE	MG/L		20
	HEAVY METALS, TOTAL RECOVERABLE	UG/L		1.4
	VOLATILE ORGANICS PRIORITY POLLUTANTS			
	VOLATILE ORGANICS			10
	VOLATILE ORGANICS RECOVERY			
	SEBACENE-10	%		101
	P-DICHLORODIBENZENE	%		102
	1,2-DICHLOROETHANE-04	%		114
	SEMI-VOLATILE ORGANICS PRIORITY POLLUTANTS			
	SEMI-VOLATILE ORGANICS			76
	SEMI-VOLATILE ORGANICS RECOVERY			
	2-PERFLUOROPHENYLPHENOL	%		98
	BENZO(A)ANTHRACENE-012	%		10
	DECAFLUOROBIPHENYL	%		104
5-1	8/27/85			
5219004	ARSENIC, SOLUBLE	MG/L		0.007
	CADMIUM, SOLUBLE	MG/L	(	0.002
	CALCIUM, SOLUBLE	MG/L		71
	CHROMIUM, SOLUBLE	MG/L	(	0.005
	CHROMIUM, HEXAVALENT	MG/L	(	0.005
	COPPER, SOLUBLE	MG/L	(	0.005
	IRON, SOLUBLE	MG/L		0.04

E. C. JOURNAL CO.
CONSULTING ENGINEERS
303 MONROE STREET
P. O. BOX 7020 L.I. STATION
PLANTATION, FLORIDA 33112
(207) 775-5401 / TELE 94-4129

REPORT OF ANALYSIS
REFERENCE NUMBER 3126

DATE 9/25/65
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STATE OF MICHIGAN
HEALTH SERV SECT ATTN: MICHIGAN
ENVIRON SERV DIV PO BOX 30029
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
8-1 5239004	8/27/65 LEAD, SOLUBLE	MG/L	0.027
	MAGNESIUM, SOLUBLE	MG/L	31
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.02
	POTASSIUM, SOLUBLE	MG/L	0.94
	SELENIUM, SOLUBLE	MG/L	0.003
	SODIUM, SOLUBLE	MG/L	7.1
	ZINC, SOLUBLE	MG/L	0.001
	ALKALINITY, AS CaCO ₃	MG/L	250
	CHLORIDE	MG/L	15
	AMMONIA, AS N	MG/L	1
	NITROGEN, AS N, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.001
	SULFATE	MG/L	40
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	51
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	50
	PHENOLICS, TOTAL RECOVERABLE	UG/L	8.1
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	VOLATILE ORGANICS		40
	VOLATILE ORGANICS RECOVERY		
	BENZENE-04	X	103
	P-SPONGEFLUOROBENZENE	X	102
	1,2-DICHLOROETHANE-04	X	113
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		40
	SEMI-VOLATILE ORGANICS RECOVERY		
	2-POSS-FLUOROPHTHALIC ACID	X	10
	BENZ(a)ANTHRACENE-04	X	19
	DECAFLUOROPHTHENYL	X	115
9 5239005	8/27/65 ARSENIC, SOLUBLE	MG/L	0.001
	CADMIUM, SOLUBLE	MG/L	0.001
	CALCIUM, SOLUBLE	MG/L	31-32
	CHROMIUM, SOLUBLE	MG/L	0.001
	CHROMIUM, HEXAVALENT	MG/L	0.001
	COPPER, SOLUBLE	MG/L	0.001
	IRON, SOLUBLE	MG/L	0.001
	LEAD, SOLUBLE	MG/L	0.001
	MAGNESIUM, SOLUBLE	MG/L	28-29
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.001
	POTASSIUM, SOLUBLE	MG/L	0.72-0.75
	SELENIUM, SOLUBLE	MG/L	0.001
	SODIUM, SOLUBLE	MG/L	2.5-3.0

E. O. JOHNSON CO.
CONSULTING ENGINEERS
500 CONGRESS STREET
P. O. BOX 7050 D.T. STATION
PORTLAND, MAINE 04112
(207) 775-5401 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER

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DATE 9/23/85
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STATE OF MICHIGAN
HEAT SERV SECT ATTN: MC KINCADE
ENVIRON SERV DIV PO BOX 30024
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
9	8/27/85		
5239005	ZINC, SOLUBLE	MG/L	1.9-2.0
	ALKALINITY, AS CaCO ₃	MG/L	270
	CHLORIDE	MG/L	3.4
	AMMONIA, AS N	MG/L	1
	NITROGEN, Kjeldahl, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.05
	SULFATE	MG/L	36
	OIL & GREASE, TOTAL MECHANICAL	MG/L	5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	12
	PHENOLICS, TOTAL RECOVERABLE	UG/L	7.8
	VOLATILE ORGANIC PRIORITY POLLUTANTS		
	VOLATILE ORGANICS		ND
	VOLATILE SURROGATE RECOVERY		
	1,1-DICHLOROETHANE	X	100
	1,1,1-TRICHLOROETHANE	X	115
	1,2-DICHLOROETHANE-1H	X	112
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		ND
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-CHLOROPHENOL	X	60
	BENZO(A)ANTHRACENE-012	X	24
	DECAFLUOROBIPHENYL	X	117
20	8/27/85		
5239006	ARSENIC, SOLUBLE	MG/L	0.005-0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	70
	CHROMIUM, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.005-0.005
	COPPER, SOLUBLE	MG/L	0.004
	IRON, SOLUBLE	MG/L	7.032
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	28
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	0.02
	SELENIUM, SOLUBLE	MG/L	0.005-0.005
	SODIUM, SOLUBLE	MG/L	2.8
	ZINC, SOLUBLE	MG/L	1.9
	ALKALINITY, AS CaCO ₃	MG/L	270
	CHLORIDE	MG/L	3.6
	AMMONIA, AS N	MG/L	1
	NITROGEN, Kjeldahl, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.05
	SULFATE	MG/L	37

E. C. JORDAN CO.
CONSULTING ENGINEERS
305 CONGRESS STREET
P. O. BOX 1000 D.T. STATION
PORTLAND, MAINE 04112
(207) 775-5461 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER 3126

DATE 9/25/85
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STATE OF MICHIGAN
HEAT SERV SECT ATTN: C MEMORANDUM
ENVIRON SERV DIV PO BOX 30028
LANSING MI 48909

CLIENT	DATE RECEIVED /		UNITS	RESULTS
LAB ID	PARAMETER			
20	8/27/85			
5239006	OIL & GREASE, TOTAL RECOVERABLE	MG/L	5	
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	60	
	PHENOLICS, TOTAL RECOVERABLE	UG/L	12	
	VOLATILE ORGANICS PRIORITY POLLUTANTS			
	VOLATILE ORGANICS		ND	
	VOLATILE SURROGATE RECOVERY			
	BENZENE-06	X	102	
	P-BROMOFLUOROBENZENE	X	97	
	1,2-DICHLOROETHANE-04	X	112	
	SEMI-VOLATILE ORGANICS PRIORITY POLLUTANTS			
	SEMI-VOLATILE ORGANICS		ND	
	SEMI-VOLATILE SURROGATE RECOVERY			
	2-PERFLUOROMETHYLPHENOL	X	25	
	BENZO(A)ANTHRACENE-012	X	10	
	DECAFLUOROBIPHENYL	X	118	
4-2	9/27/85			
5239007	ARSENIC, SOLUBLE	MG/L	0.006	
	CADMIUM, SOLUBLE	MG/L	0.002	
	CALCIUM, SOLUBLE	MG/L	74	
	CHROMIUM, SOLUBLE	MG/L	0.007	
	CHROMIUM, HEXAVALENT	MG/L	0.003	
	COPPER, SOLUBLE	MG/L	0.003	
	IRON, SOLUBLE	MG/L	0.65	
	LEAD, SOLUBLE	MG/L	0.029	
	MAGNESIUM, SOLUBLE	MG/L	31	
	MERCURY, SOLUBLE	UG/L	1.5	
	NICKEL, SOLUBLE	MG/L	0.020	
	POTASSIUM, SOLUBLE	MG/L	0.50	
	SELENIUM, SOLUBLE	MG/L	0.003	
	SODIUM, SOLUBLE	MG/L	8.6	
	ZINC, SOLUBLE	MG/L	0.005	
	ALKALINITY, AS CaCO3	MG/L	286	
	CHLORIDE	MG/L	13	
	AMMONIA, AS N	MG/L	1	
	NITROGEN, KJELDAHL, TOTAL		4	
	TOTAL PHOSPHORUS, AS P	MG/L	0.05	
	SULFATE	MG/L	41	
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	5	
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	14	
	PHENOLICS, TOTAL RECOVERABLE	UG/L	6.2	
	VOLATILE ORGANICS PRIORITY POLLUTANTS			
	VOLATILE ORGANICS		ND	
	VOLATILE SURROGATE RECOVERY			
	BENZENE-06	X	94	

E. C. JORDAN CO.
CONSULTING ENGINEERS
502 CONGRESS STREET
P. O. BOX 7050 D.T. STATION
PORTLAND, MAINE 04112
(207) 775-5401 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER 3126

DATE 9/25/85
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STATE OF MICHIGAN
NIGHT SERV SECT ATTIC MICHIGAN
ENVIRON SERV DIV PO BOX 30008
LANSING MI 48909

CLIENT	DATE RECEIVED /		UNITS	RESULTS
LAB ID	PARAMETER			
6-2	8/27/85			
5239007	P-BROMOFLUOROBENZENE	X		94
	1,2-DICHLOROETHANE-D4	X		110
	SEMIVOLATILE ORGANIC PRIORITY POLLUTANTS			ND
	SEMIVOLATILE SURROGATE RECOVERY			ND
	2-PERFLUOROMETHYLPHENYL	X		101
	BENZO(A)ANTHRACENE-D12	X		42
	DECAFLUOROBIPHENYL	X		142
7-3	8/27/85			
5239008	ARSENIC, SOLUBLE	MG/L	(	0.005
	CADMIUM, SOLUBLE	MG/L	(	0.003
	CALCIUM, SOLUBLE	MG/L	(	80
	CHLORIDE, SOLUBLE	MG/L	(	0.005
	CHROMIUM, HEXAVALENT	MG/L	(	0.005
	COPPER, SOLUBLE	MG/L	(	0.044
	IRON, SOLUBLE	MG/L	(	0.045
	LEAD, SOLUBLE	MG/L	(	0.020
	MAGNESIUM, SOLUBLE	MG/L	(	30
	MERCURY, SOLUBLE	UG/L	(	1.0
	NICKEL, SOLUBLE	MG/L	(	0.020
	POTASSIUM, SOLUBLE	MG/L	(	1.0
	SELENIUM, SOLUBLE	MG/L	(	0.005
	SODIUM, SOLUBLE	MG/L	(	1.5
	ZINC, SOLUBLE	MG/L	(	0.045
	ALKALINITY, AS CaCO3	MG/L	(	200
	CHLORIDE	MG/L	(	12
	AMMONIA, AS N	MG/L	(	1
	NITROGEN, NITRATE, TOTAL	MG/L	(	1
	TOTAL PHOSPHORUS, AS P	MG/L	(	0.05
	SULFATE	MG/L	(	40
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	(	5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	(	51
	PHENOLICS, TOTAL RECOVERABLE	UG/L	(	5
	VOLATILE ORGANIC PRIORITY POLLUTANTS			ND
	VOLATILE SURROGATE RECOVERY			ND
	BENZENE-D6	X		87
	P-BROMOFLUOROBENZENE	X		92
	1,2-DICHLOROETHANE-D4	X		125
	SEMIVOLATILE ORGANIC PRIORITY POLLUTANTS			ND
	SEMIVOLATILE SURROGATE RECOVERY			ND
	2-PERFLUOROMETHYLPHENYL	X		75
	BENZO(A)ANTHRACENE-D12	X		41

E. C. JORDAN CO.
CONSULTING ENGINEERS
562 COMMERCE STREET
P. O. BOX 7000 D.T. STATION
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(207) 773-5401 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER

3126

DATE 9/25/82
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STATE OF MICHIGAN
MONT SEV SECT ATTIC MEMORANDUM
ENVIRON SERV DIV PO BOX 30128
LANSING MI 48909

CLIENT	DATE RECEIVED /		UNITS	RESULTS
LAB ID	PARAMETER			
7-3	9/27/82			
5239008	BETA-LUMINOUSMENTL	X		105
7-4	8/27/82			
5239009	ARSENIC, SOLUBLE	MG/L	(	0.006
	CADMIUM, SOLUBLE	MG/L	(	0.002
	CALCIUM, SOLUBLE	MG/L	(	2
	CHROMIUM, SOLUBLE	MG/L	(	0.005
	CHROMIUM, HEXAVALENT	MG/L	(	0.005
	COPPER, SOLUBLE	MG/L	(	0.005
	IRON, SOLUBLE	MG/L	(	0.74
	LEAD, SOLUBLE	MG/L	(	0.020
	MAGNESIUM, SOLUBLE	MG/L	(	34
	MERCURY, SOLUBLE	UG/L	(	1.0
	NICKEL, SOLUBLE	MG/L	(	0.020
	POTASSIUM, SOLUBLE	MG/L	(	1.0
	SELENIUM, SOLUBLE	MG/L	(	0.005
	SODIUM, SOLUBLE	MG/L	(	7.0
	ZINC, SOLUBLE	MG/L	(	0.005
	ALKALINITY, AS CaCO3	MG/L	(	200
	CHLORIDE	MG/L	(	14
	AMMONIA, AS N	MG/L	(	1
	NITROGEN, NITRICAL, TOTAL	MG/L	(	1
	TOTAL PHOSPHORUS, AS P	MG/L	(	0.14
	SULFATE	MG/L	(	37
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	(	5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	(	53
	PHENOLICS, TOTAL RECOVERABLE	UG/L	(	5
	VOLATILE ORGANICS PRIORITY POLLUTANTS			NO
	VOLATILE ORGANICS			NO
	VOLATILE SURROGATE RECOVERY			
	BENZENE-04	X		102 98
	P-BROMOPHENOL	X		106 94
	1,2-DICHLOROETHANE-04	X		110 116
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS			NO
	SEMI-VOLATILE ORGANICS			NO
	SEMI-VOLATILE SURROGATE RECOVERY			
	2-PERFLUOROPHENYLPHENOL	X		62
	BENZ(D)ANTHRACENE-012	X		70
	DECHLOROBIPHENYL	X		70
21	8/27/82			
5239010	ARSENIC, SOLUBLE	MG/L	(	0.006
	CADMIUM, SOLUBLE	MG/L	(	0.002
	CALCIUM, SOLUBLE	MG/L	(	0.11
	CHROMIUM, SOLUBLE	MG/L	(	0.005

E. C. JOHNSON CO.
CONSULTING ENGINEERS
340 CONGRESS STREET
P. O. BOX 7050 S.F. STATION
PORTLAND OREGON 97208
(503) 775-5431 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER 3124

DATE 9/25/85
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STATE OF MICHIGAN
NATL SERV SECT ATTN: C MEMBERS
ENVIRON SERV DIV PO BOX 30028
LANSING MI 48909

CLIENT	DATE RECEIVED /	PARAMETER	UNITS	RESULTS
21	8/27/85			
SL39010		CHROMIUM, HEXAVALENT	MG/L	0.00
		COPPER, SOLUBLE	MG/L	0.00
		IRON, SOLUBLE	MG/L	0.00
		LEAD, SOLUBLE	MG/L	0.00
		MANGANESE, SOLUBLE	MG/L	0.00
		MERCURY, SOLUBLE	UG/L	1.00
		NICKEL, SOLUBLE	MG/L	0.00
		POTASSIUM, SOLUBLE	MG/L	0.00
		SELENIUM, SOLUBLE	MG/L	0.00
		SODIUM, SOLUBLE	MG/L	0.00
		ZINC, SOLUBLE	MG/L	0.00
		ALKALINITY, AS CaCO3	MG/L	0.00
		CHLORIDE	MG/L	0.00
		AMMONIA, AS N	MG/L	0.00
		NITROGEN, NITRATE, TOTAL	MG/L	0.00
		TOTAL PHOSPHORUS, AS P	MG/L	0.00
		SULFATE	MG/L	0.00
		OIL & GREASE, TOTAL RECOVERABLE	MG/L	0.00
		TOTAL ORGANIC CARBON, SOLUBLE	MG/L	0.00
		PHENOLICS, TOTAL RECOVERABLE	UG/L	0.00
		VOLATILE ORGANIC PRIORITY POLLUTANTS		
		VOLATILE SURrogate RECOVERY		
		BENZENE-D6	X	
		P-BROMOPHENOL	X	
		1,2-DICHLOROETHANE-D4	X	
		SERIVOLATILE ORGANIC PRIORITY POLLUTANTS		
		SERIVOLATILE SURrogate RECOVERY		
		2-FLUOROPHENOL	X	
		BENZO(A)ANTHRACENE-D12	X	
		DECAFLUOROPHENYL	X	

SIGNATURE

Richard A. Turner

REPORT TO STEPHEN A. TURNER
AUTHORIZATION 440591

BILLED SEP 28 1985
= 5844 -
In = 3252.40

MDNR

SEMIVOLATILE ORGANIC PRIORITY POLLUTANTS - MATRIX SPIKE RESULTS

#21

ECJ #5239010

<u>COMPOUND</u>	<u>RECOVERY (%)</u>
2,4,6-trichlorophenol	91
2-chlorophenol	93
2,4-dimethylphenol	87
2-nitrophenol	81
pentachlorophenol	41
phenol	51
acenaphthene	95
1,2,4-trichlorobenzene	108
hexachlorobenzene	156
2-chloronaphthalene	109
1,2-dichlorobenzene	134
1,3-dichlorobenzene	130
1,4-dichlorobenzene	130
3,3'-dichlorobenzidine	37
2,4-dinitrotoluene	73
2,6-dinitrotoluene	130
fluoranthene	45
4-chlorophenyl phenyl ether	145
bis(2-chloroethoxy) methane	101
hexachlorobutadiene	136
isophorone	31
naphthalene	99
nitrobenzene	56
N-nitrosodiphenylamine	151
N-nitrosodi-n-propylamine	110
bis(2-ethylhexyl) phthalate	43
butyl benzyl phthalate	35
di-n-butyl phthalate	82
di-n-octyl phthalate	66
diethyl phthalate	78
dimethyl phthalate	58
benzo (a) anthracene/chrysene	29
benzo (a) pyrene	80
benzo (b) fluoranthene	56
acenaphthylene	114
anthracene/phenanthrene	90
fluorene	159
dibenzo (a,b) anthracene	37
pyrene	75
2-perfluoromethylphenol	74
decafluorobiphenyl	135
benzo (a) anthracene-d12	48

spiked at 100 ug/l

MEMO
PESTICIDES/PCBs - MATRIX SPIKE

#21
ECJ #5239010

<u>COMPOUND</u>	<u>RECOVERY (%)</u>
Aldrin	63
dieldrin	48
4,4'-DDT	48
4,4'-DDE	63
4,4'-DDD	66
A-endosulfan	40
endrin	51
heptachlor epoxide	100
A-BHC	73
B-BHC	52
D-BHC	33

MDMR

copy

VOLATILE ORGANICS - MATRIX SPI

#7-3
ECJ #5239008

<u>COMPOUND</u>	<u>RECOVERY (%)</u> *
benzene	101
carbon tetrachloride	79
chlorobenzene	88
1,2-dichloroethane	102
1,1,1-trichloroethane	88
1,1-dichloroethane	46
1,1,2-trichloroethane	100
1,1,2,2-tetrachloroethane	116
chloroethane	112
2-chloroethylvinylether	-
chloroform	94
1,1-dichloroethane	91
trans-1,2-dichloroethane	91
1,2-dichloropropane	107
trans-1,3-dichloropropane	-
cis-1,3-dichloropropane	-
ethylbenzene	81
methylene chloride	121
chloromethane	-
bromomethane	110
bromoform	90
bromodichloromethane	-
trichlorofluoromethane	-
dibromochloromethane	99
tetrachloroethane	83
toluene	89
trichloroethane	83
vinyl chloride	-
<u>Surrogate Recovery (%)</u>	
1,2-dichloroethane-d4	116
benzene-d6	94
p-bromofluorobenzene	88

* spiked at 20 ug/l

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(207) 778-6401 / TELEX: 84-4328

REPORT OF ANALYSIS

State of Michigan
ATTN: C. Menovska
Environ. Services Div.
P.O. Box 30020
Lansing, MI 48909

Samples Rec'd: 8/27/85

Data Reported: 9/25/85

Project No.: 4465-91

Lab No.: 5239003-10

SAMPLE IDENTIFICATION

PARAMETER	Client	103	6-1	9	20	6-2
	Lab	5239003	5239004	5239005	5239006	5239007

Carbonate, mg/l	0.08	1.1	0.05	0.05	0.58
Bicarbonate, mg/l	130	150	130	130	150

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(207) 776-8401 / TELEX: 94-4328

REPORT OF ANALYSIS - PAGE OF

SAMPLE IDENTIFICATION

PARAMETER	Client	7-3	6-3/4	21
	Lab	5239008	5239009	5239010

Carbonate, mg/l	1.8	0.16	*
Bicarbonate, mg/l	160	140	*

* pH data was not available

Results expressed in mg/l unless otherwise noted.

EC JORDAN CO.

Supervisor

Stephen A. Turner, Chemist

Supplemental Information

Sampling Site: As Noted

Sampled By: ECJ

Authorization: 4465-91

Analytical Methods: • 1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-78-020, U.S. Environmental Protection Agency, March 1978.
• 2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
• 3. Others as designated.

E.C. JORDAN CO.

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582 CONGRESS STREET / P.O. BOX 7080 • PORTLAND, MAINE 04112
(207) 776-6401 / TELEX: 94-4328

REPORT OF ANALYSIS

State of Michigan
ATTN: C. Manovska
Environ. Services Div.
P.O. Box 30020
Lansing, MI 48909

Samples Rec'd: 8/27/85
Date Reported: 10/4/85
Project No.: 4465-91
Lab No.: 5239003-010

SAMPLE IDENTIFICATION

PARAMETER	Client	10S	6-1	9	20	6-2
	Lab	5239003	5239004	5239005	5239006	5239007

Antimony, mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005*
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* Duplicate analysis

E.C. JORDAN CO.

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REPORT OF ANALYSIS - PAGE 2 OF 2

PARAMETER	SAMPLE IDENTIFICATION			
	Client			
		7-3	6-3/4	21
	Lab	5239008	5239009	5239010
Antimony, mg/l		<0.005	<0.005	<0.005

Results expressed in mg/l unless otherwise noted.

E.C. JORDAN CO.

Supervisor

Richard A. Rozene
Richard A. Rozene

Supplemental Information

Sampling Site: As Noted
Sampled By: ECJ
Authorization: 4465-91

Analytical Methods:

1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-79-020, U.S. Environmental Protection Agency, March 1979.
2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
3. Others as designated.

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CHAIN OF CUSTODY RECORD

[illegible]

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 P. O. BOX 7026 D.T. STATION
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REPORT NO. 116
 REFERENCE NUMBER 4127

DATE 7/25/85
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STATE OF MICHIGAN
 DEPT. ENV. SERV. ATTN: REMEDIAL
 DIVISION SERV. DIV. PO BOX 30000
 LANSING MI 48209

CLIENT	DATE RECEIVED /		UNITS	RESULTS
LAB ID	PARAMETER			
145	8/28/85			
5240001	ARSENIC, SOLUBLE	mg/L	0.005	
	CADMIUM, SOLUBLE	mg/L	0.002	
	CALCIUM, SOLUBLE	mg/L	170	
	CHROMIUM, SOLUBLE	mg/L	0.005	
	CHROMIUM, HEXAVALENT	mg/L	0.005	
	COPPER, SOLUBLE	mg/L	0.027	
	IRON, SOLUBLE	mg/L	1.4	
	LEAD, SOLUBLE	mg/L	0.026	
	MANGANESE, SOLUBLE	mg/L	45	
	MERCURY, SOLUBLE	ug/L	1.0	
	NICKEL, SOLUBLE	mg/L	0.029	
	POTASSIUM, SOLUBLE	mg/L	1.4	
	SELENIUM, SOLUBLE	mg/L	0.005	
	SODIUM, SOLUBLE	mg/L	5.3	
	ZINC, SOLUBLE	mg/L	4.2	
	ALKALINITY, AS CaCO ₃	mg/L	250	
	CHLORIDE	mg/L	7.7	
	AMMONIA, AS N	mg/L	1	
	NITROGEN, NITRATE, TOTAL	mg/L	1.1	
	TOTAL PHOSPHORUS, AS P	mg/L	2.5-2.4	
	SULFATE	mg/L	36	
	OIL & GREASE, TOTAL RECOVERABLE	mg/L	3	
	TOTAL ORGANIC CARBON, SOLUBLE	mg/L	46	
	PHENOLICS, TOTAL RECOVERABLE	ug/L	5	
	VOLATILE ORGANICS PRIORITY POLLUTANTS			
	METHYLENE CHLORIDE	ug/L	3.5	
	TRICHLOROFLUOROMETHANE	ug/L	160	
	1,1-DICHLOROETHANE	ug/L	8.3	
	1,1,1-TRICHLOROETHANE	ug/L	9.8	
	VOLATILE SULFONATE RECOVERY			
	BENZENE-D4	%	103	
	P-FLUOROTOLUENE	%	70	
	1,2-DICHLOROETHANE-D4	%	122	
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS			
	DIETHYLPHTHALATE	ug/L	8.4-7.5	
	SEMI-VOLATILE SULFONATE RECOVERY			
	2-FLUOROMETHYLPHENOL	%	102	
	BENZ(A)ANTHACENE-D12	%	20	
	DECAFLUOROBIPHENYL	%	143	
175	8/28/85			
5240002	ARSENIC, SOLUBLE	mg/L	0.005	
	CADMIUM, SOLUBLE	mg/L	0.002	
	CALCIUM, SOLUBLE	mg/L	33-79	
	CHROMIUM, SOLUBLE	mg/L	0.005	

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REPORT NO. 1916
REFERENCE NUMBER

3127

DATE 9/21/85
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STATE OF MICHIGAN
NIGHT SERV SECT ATTN: C. MENAUSKE
ENVIRON SERV DIV PO BOX 30020
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
179 5240002	6/20/85 CHROMIUM, HEXAVALENT	MG/L	0.015
	COPPER, SOLUBLE	MG/L	0.07-0.08
	IRON, SOLUBLE	MG/L	6.2-9.7
	LEAD, SOLUBLE	MG/L	0.020-0.020
	MAGNESIUM, SOLUBLE	MG/L	30-35
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020-0.020
	POTASSIUM, SOLUBLE	MG/L	3.0-3.5
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	15-16
	ZINC, SOLUBLE	MG/L	0.00-0.008
	ALKALINITY, AS CaCO ₃	MG/L	820
	CHLORIDE	MG/L	40-40
	AMMONIA, AS N	MG/L	1
	NITROGEN, Kjeldahl, TOTAL	MG/L	2.0
	TOTAL PHOSPHORUS, AS P	MG/L	0.10-0.15
	SULFATE	MG/L	4.1
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	1.5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	7.5
	PHENOLICS, TOTAL RECOVERABLE	UG/L	24-22
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	TOLUENE	UG/L	650
	BENZENE	UG/L	10
	ETHYLBENZENE	UG/L	1400
	METHYLENE CHLORIDE	UG/L	70
	1,1-DICHLOROETHANE	UG/L	90
	VOLATILE SULFONATE RECOVERY		
	BENZENE-D4	X	97
	P-FLUOROBENZENE	X	95
	1,2-DICHLOROETHANE-D4	X	115
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	DIOCTYLPHTHALATE	UG/L	410
	SEMI-VOLATILE SULFONATE RECOVERY		
	2-FLUOROBENZENE	X	82
	BENZ(a)ANTHRAcene-812	X	39
	DECAFLUOROBIPHENYL	X	142
100 5240003	8/20/85 ARSENIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	80
	CHLORIDE, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.005
	COPPER, SOLUBLE	MG/L	0.004
	IRON, SOLUBLE	MG/L	0.005

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REPORT OF ANALYSIS
REFERENCE NUMBER 3127

DATE 9/25/65
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STATE OF MICHIGAN
NIGHT SERV SECT ATTORNEY GENERAL
ENVIRONMENT SERV DIV PO BOX 30024
LANSING MI 48209

CLIENT LAB ID	DATE RECEIVED / INSTRUMENT	UNITS	RESULTS
100 5240003	8/28/65		
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	28
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	0.93
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	3.7
	ZINC, SOLUBLE	MG/L	1.5
	ALKALINITY, AS CaCO3	MG/L	230
	CHLORIDE	MG/L	8.4
	AMMONIA, AS N	MG/L	1
	NITROGEN, AS LIQUID, TOTAL	MG/L	1-1
	TOTAL PHOSPHORUS, AS P	MG/L	0.05
	SULFATE	MG/L	40-38
	ODL & GREASE, TOTAL RECOVERABLE	MG/L	3
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	28
	PHENOLICS, TOTAL RECOVERABLE	UG/L	9.0
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	VOLATILE ORGANICS		ND
	VOLATILE SURROGATE RECOVERY		
	BENZENE-C6	X	93
	P-PROPYLENEBENZENE	X	107
	1,2-DICHLOROETHANE-04	X	116
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		ND
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-PERFLUOROMETHYLPHENOL	X	73
	BENZ(a)ANTHRACENE-012	X	37
	DECAFLUOROBIPHENYL	X	137
156 5240004	8/28/65		
	ARSENIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	150
	CHROMIUM, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.005
	COPPER, SOLUBLE	MG/L	0.015
	IRON, SOLUBLE	MG/L	0.18
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	45
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	1.0
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	14

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REPORT OF ANALYSIS
REFERENCE NUMBER 3127

DATE 9/25/85
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STATE OF MICHIGAN
NIGHT SERV SECT ATTN: C. MENUSSE
ENVIRON SERV DIV PO BOX 30028
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
156	8/25/85		
5240004	ZINC, SOLUBLE	MG/L	0.85
	ALKALINITY, AS CaCO3	MG/L	330
	CHLORIDE	MG/L	23
	AMMONIA, AS N	MG/L	1-1
	NITROGEN, Kjeldahl, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.94
	SULFATE	MG/L	45
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	(
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	15.0
	PHENOLICS, TOTAL RECOVERABLE	UG/L	5
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	METHYLENE CHLORIDE	UG/L	5.5
	TRICHLOROETHYLENE	UG/L	200
	1,1-DICHLOROETHANE	UG/L	25
	1,1,1-TRICHLOROETHANE	UG/L	12
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D6	%	96
	P-BROMOFLUOROBENZENE	%	95
	1,2-DICHLOROETHANE-D4	%	120
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		ND
	SEMI-VOLATILE SURROGATE RECOVERY		
	3-PERFLUOROMETHYLPHENOL	%	110
	BENZ(A)ANTHRAcene-D12	%	40
	DECAFLUOROPHENYL	%	134
150	8/24/85		
5240005	SILICIC, SOLUBLE	MG/L	(.005, .005
	CADMIUM, SOLUBLE	MG/L	(0.002
	CALCIUM, SOLUBLE	MG/L	(96
	CHROMIUM, SOLUBLE	MG/L	(0.005
	CHROMIUM, HEXAVALENT	MG/L	(.005, .005
	COPPER, SOLUBLE	MG/L	(0.006
	IRON, SOLUBLE	MG/L	(0.035
	LEAD, SOLUBLE	MG/L	(0.020
	MAGNESIUM, SOLUBLE	MG/L	(39
	MERCURY, SOLUBLE	UG/L	(1.0
	NICKEL, SOLUBLE	MG/L	(0.020
	POTASSIUM, SOLUBLE	MG/L	(1.4
	SELENIUM, SOLUBLE	MG/L	(.005, .005
	SODIUM, SOLUBLE	MG/L	(17
	ZINC, SOLUBLE	MG/L	(1.6
	ALKALINITY, AS CaCO3	MG/L	(360
	CHLORIDE	MG/L	(11
	AMMONIA, AS N	MG/L	(1

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502 CONGRESS STREET
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PORTLAND, ME 04112
(207) 775-5401 / TELEX 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER 3127

DATE 9/22/85
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STATE OF MICHIGAN
NIGHT SERV SECT ATTN: C. MENA
ENVIRON SERV DIV PO BOX 30024
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
150	8/26/85		
5240005	NITROGEN, KJELDAHL, TOTAL	MG/L	1.1
	TOTAL PHOSPHORUS, AS P	MG/L	1.1
	SULFATE	MG/L	48
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	12.5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	12.5
	PHENOLICS, TOTAL RECOVERABLE	UG/L	5
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	METHYLENE CHLORIDE	UG/L	5.5
	TRICHLOROETHYLENE	UG/L	23
	VOLATILE SURROGATE RECOVERY		
	BENZENE-04	%	100
	P-BROMOFLUOROBENZENE	%	95
	1,2-DICHLOROETHANE-04	%	102
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	BIS(2-ETHYLHEXYL)PHTHALATE	UG/L	60
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-PERFLUOROMETHYLPHENOL	%	94
	BENZOXANTHACENE-312	%	72
	DECAFLUOROPHENYL	%	71
170	8/26/85		
5240006	ARSENIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	74
	CHROMIUM, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.002
	COPPER, SOLUBLE	MG/L	0.014
	IRON, SOLUBLE	MG/L	0.039
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	71
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.005
	POTASSIUM, SOLUBLE	MG/L	0.87
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	3.0
	ZINC, SOLUBLE	MG/L	0.34
	ALKALINITY, AS CaCO3	MG/L	130
	CHLORIDE	MG/L	9.0
	AMMONIA, AS N	MG/L	1
	NITROGEN, KJELDAHL, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.36
	SULFATE	MG/L	43
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	5
	PHENOLICS, TOTAL RECOVERABLE	UG/L	5

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MONTREAL, MAINE 04112
(207) 775-5401 / TELE 94-1329

REPORT OF ANALYSIS
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DATE 9/25/85
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STATE OF MICHIGAN
NIGHT SERV SECT ATTN: KENNAWE
ENVIRON SERV DIV PO BOX 36425
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
170 5240006	8/28/85 VOLATILE ORGANICS PRIORITY POLLUTANTS		
	TOLUENE	UG/L	4.2
	ETHYLBENZENE	UG/L	11
	TRICHLOROETHYLENE	UG/L	11
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D6	X	100
	P-BROMOFLUOROBENZENE	X	100
	1,2-DICHLOROETHANE-D4	X	121
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-FLUOROPHENYLPHENOL	X	145
	DECAFLUOROBIPHENYL	X	145
22 5240007	8/28/85		
	ARSENIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	0.001
	CHROMIUM, SOLUBLE	MG/L	0.001
	CHROMIUM, HEXAVALENT	MG/L	0.001
	COPPER, SOLUBLE	MG/L	0.045
	IRON, SOLUBLE	MG/L	0.034
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	0.063
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	0.027
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	0.066
	ZINC, SOLUBLE	MG/L	0.024
	ALKALINITY, AS CALCIUM CHLORIDE	MG/L	20
	AMMONIA, AS N	MG/L	1
	NITROGEN, KJELDAHL, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	1.3
	SULFATE	MG/L	1.6
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	1.3
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	1.3
	PHENOLICS, TOTAL RECOVERABLE	UG/L	1.7
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	METHYLENE CHLORIDE	UG/L	1.7
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D6	X	100
	P-BROMOFLUOROBENZENE	X	100

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CONSULTING ENGINEERS
515 CONGRESS STREET
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REPORT NO. 1518
REFERENCE NUMBER

3127

DATE 9/25/85
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STATE OF MICHIGAN
NIGHT SEW SECT ATTNIC HENGEVUE
ENVIRON SERV DIV PO BOX 30028
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
22 5240007	8/28/85 1,2-DICHLOROETHANE-D4	X	116
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		ND
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-PHENYLFUORENETHYLPHENOL	X	66
	BENZO(A)ANTHRACENE-D12	X	74
	DECAFLUOROBIPHENYL	X	69
16 5240008	8/28/85		
	ARSENIC, SOLUBLE	MG/L	0.009
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	2.0
	CHROMIUM, SOLUBLE	MG/L	0.002
	CHROMIUM, HEXAVALENT	MG/L	0.002
	COPPER, SOLUBLE	MG/L	0.002
	IRON, SOLUBLE	MG/L	0.002
	LEAD, SOLUBLE	MG/L	0.002
	MAGNESIUM, SOLUBLE	MG/L	36
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.002
	POTASSIUM, SOLUBLE	MG/L	1.0
	SELENIUM, SOLUBLE	MG/L	0.002
	SODIUM, SOLUBLE	MG/L	36
	ZINC, SOLUBLE	MG/L	0.17
	ALCALINITY, AS $CaCl_2$	MG/L	240
	CHLORIDE	MG/L	36
	AMMONIA, AS N	MG/L	1.0
	NITROGEN, KJELDAHL, TOTAL	MG/L	1.0
	TOTAL PHOSPHORUS, AS P	MG/L	1.2
	SULFATE	MG/L	1.2
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	3.0
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	64
	PHENOLICS, TOTAL RECOVERABLE	UG/L	54
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	VOLATILE ORGANICS		ND
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D6	X	94
	P-PROPYLFLUOROBENZENE	X	87
	1,2-DICHLOROETHANE-D4	X	119
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	DI-N-BUTYLPHthalate	UG/L	17
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-PHENYLFUORENETHYLPHENOL	X	106
	BENZO(A)ANTHRACENE-D12	X	66
	DECAFLUOROBIPHENYL	X	70

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PORTLAND, MAINE 04112
(207) 775-5401 / TELETYPE 94-4329

REPORT OF ANALYSIS
REFERENCE NUMBER 3127

DATE 7/25/85
PAGE 8

STATE OF MICHIGAN
MGT SERV SECT ATTN: REMOVES
ENVIRON SERV DIV PO BOX 30023
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
11	8/28/85		
5240009	ARSENIC, SOLUBLE	MG/L	0.002
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	60
	CHROMIUM, SOLUBLE	MG/L	3.002
	CHROMIUM, HEXAVALENT	MG/L	0.002
	COPPER, SOLUBLE	MG/L	0.017
	IRON, SOLUBLE	MG/L	0.030
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	31
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	0.5
	SELENIUM, SOLUBLE	MG/L	0.002
	SODIUM, SOLUBLE	MG/L	3.5
	ZINC, SOLUBLE	MG/L	0.35
	ALKALINITY, AS CaCO3	MG/L	150
	CHLORIDE	MG/L	15
	AMMONIA, AS N	MG/L	1
	NITROGEN, KJELDAHL (TOTAL)	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	0.02
	SULFATE	MG/L	50
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	5
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	26-24
	PHENOLICS, TOTAL RECOVERABLE	UG/L	5
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	METHYLENE CHLORIDE	UG/L	3.3
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D4	X	99
	P-BROMOFLUOROBENZENE	X	88
	1,2-DICHLOROETHANE-D4	X	121
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		ND
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-REFLUOROMETHYLPHENOL	X	128
	BENZ(a)ANTHRACENE-012	X	91
	DECAFLUOROIMPHENYL	X	54
140	8/28/85		
5240010	ARSENIC, SOLUBLE	MG/L	0.002
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	120
	CHROMIUM, SOLUBLE	MG/L	0.002
	CHROMIUM, HEXAVALENT	MG/L	0.002
	COPPER, SOLUBLE	MG/L	0.027
	IRON, SOLUBLE	MG/L	0.061

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REPORT OF ANALYSIS
REFERENCE NUMBER 3127

DATE 9/25/85
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STATE OF MICHIGAN
NIGHT SERV SECT ATOMIC REMOVING
DIVISION SERV DIV PO BOX 30023
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED PARAMETER	UNITS	RESULTS
140	8/28/85		
5240010	LEAD, SOLUBLE	MG/L	0.04
	MAGNESIUM, SOLUBLE	MG/L	36
	MERCURY, SOLUBLE	UG/L	1.04
	NICKEL, SOLUBLE	MG/L	0.026
	POTASSIUM, SOLUBLE	MG/L	0.75
	SELENIUM, SOLUBLE	MG/L	0.002
	SODIUM, SOLUBLE	MG/L	3.6
	ZINC, SOLUBLE	MG/L	22
	ALKALINITY, AS CALCS	MG/L	470-470
	CHLORIDE	MG/L	5.8
	AMMONIA, AS N	MG/L	1
	NITROGEN, NITROGEN, TOTAL	MG/L	1
	TOTAL PHOSPHORUS, AS P	MG/L	3.06
	SULFATE	MG/L	44
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	3
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	26
	PHENOLICS, TOTAL RECOVERABLE	UG/L	3
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	TRICHLOROETHYLENE	UG/L	81
	VOLATILE SULFONATE RECOVERY		
	BENZENE-04	X	96
	P-BROMOFLUOROBENZENE	X	106
	1,2-DICHLOROETHANE-04	X	93
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	SEMI-VOLATILE ORGANICS		80
	SEMI-VOLATILE SULFONATE RECOVERY		
	2-TRIFLUOROMETHYLPHENOL	X	86
	BENZOKYANTHRACENE-012	X	73
	DECAFLUOROBIPHENYL	X	81
23	8/28/85		
5240011	ARSENIC, SOLUBLE	MG/L	0.11
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	97
	CHROMIUM, SOLUBLE	MG/L	0.002
	CHROMIUM, HEXAVALENT	MG/L	0.005
	COPPER, SOLUBLE	MG/L	0.009
	IRON, SOLUBLE	MG/L	4.6
	LEAD, SOLUBLE	MG/L	0.026
	MAGNESIUM, SOLUBLE	MG/L	36
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.026
	POTASSIUM, SOLUBLE	MG/L	3.4
	SELENIUM, SOLUBLE	MG/L	0.002
	SODIUM, SOLUBLE	MG/L	18

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REPORT OF ANALYSIS
REFERENCE NUMBER

3127

DATE 9/23/85
PAGE 10

STATE OF MICHIGAN
NIGHT SERV SECT ATTN: C. REMONOVIC
ENVIRON SERV DIV PO BOX 30028
LANSING MI 48909

CLIENT LAB ID	DATE RECEIVED / PARAMETER	UNITS	RESULTS
23	8/28/85		
5240011	ZINC, SOLUBLE	MG/L	0.78
	ALKALINITY, AS CaCO ₃	MG/L	126
	CHLORIDE	MG/L	26
	AMMONIA, AS N	MG/L	2.1
	NITROGEN, KALLIUM, TOTAL	MG/L	2.1
	TOTAL PHOSPHORUS, AS P	MG/L	0.13
	SULFATE	MG/L	4.3
	OIL & GREASE, TOTAL RECOVERABLE	MG/L	1.1
	TOTAL ORGANIC CARBON, SOLUBLE	MG/L	75-75
	PHENOLICS, TOTAL RECOVERABLE	UG/L	26
	VOLATILE ORGANICS PRIORITY POLLUTANTS		
	TOLUENE	UG/L	666
	BENZENE	UG/L	24
	ETHYLBENZENE	UG/L	1500
	1,1-DICHLOROETHANE	UG/L	95
	1,2-DICHLOROETHANE	UG/L	28
	VOLATILE SURROGATE RECOVERY		
	BENZENE-D6	X	101
	P-BROMOFLUOROBENZENE	X	111
	1,2-DICHLOROETHANE-D4	X	96
	SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		
	BIS(2-ETHYLNETHYL)PHTHALATE	UG/L	12
	SEMI-VOLATILE SURROGATE RECOVERY		
	2-PERFLUOROMETHYLPHENOL	X	102
	BENZ(1,2,3,4)ANTHRACENE-D12	X	72
	DECAFLUOROBIPHENYL	X	144
12	8/28/85		
5240012	ARSENIC, SOLUBLE	MG/L	0.005
	CADMIUM, SOLUBLE	MG/L	0.002
	CALCIUM, SOLUBLE	MG/L	26
	CHROMIUM, SOLUBLE	MG/L	0.005
	CHROMIUM, HEXAVALENT	MG/L	0.005
	COPPER, SOLUBLE	MG/L	0.017
	IRON, SOLUBLE	MG/L	0.028
	LEAD, SOLUBLE	MG/L	0.020
	MAGNESIUM, SOLUBLE	MG/L	27
	MERCURY, SOLUBLE	UG/L	1.0
	NICKEL, SOLUBLE	MG/L	0.020
	POTASSIUM, SOLUBLE	MG/L	0.83
	SELENIUM, SOLUBLE	MG/L	0.005
	SODIUM, SOLUBLE	MG/L	3.7
	ZINC, SOLUBLE	MG/L	1.3
	ALKALINITY, AS CaCO ₃	MG/L	220
	CHLORIDE	MG/L	220

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REPORT OF ANALYSIS
REFERENCE NUMBER 3127

DATE 9/25/85
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STATE OF MICHIGAN
WATER SERV SECT ATTN: C. REMOVING
ENVIRON SERV DIV PO BOX 30028
LANSING MI 48909

CLIENT	DATE RECEIVED /	LAB ID	PARAMETER	UNITS	RESULTS
12	8/28/85				
524012			AMMONIA, AS N	MG/L	1
			NITROGEN, KJELDAHL, TOTAL	MG/L	1
			TOTAL PHOSPHORUS, AS P	MG/L	0.05
			SULFATE	MG/L	39
			OIL & GREASE, TOTAL RECOVERABLE	MG/L	3
			TOTAL ORGANIC CARBON, SOLUBLE	MG/L	30
			PHENOLICS, TOTAL RECOVERABLE	UG/L	7.7
			VOLATILE ORGANICS PRIORITY POLLUTANTS		10
			VOLATILE SUBSTANT RECOVERY		100
			BENZENE-04	%	95
			P-BROMOFLUOROBENZENE	%	97
			1,2-DICHLOROETHANE-04	%	97
			SEMI-VOLATILE ORGANIC PRIORITY POLLUTANTS		30
			DI-N-BUTYLPHTHALATE	UG/L	30
			SEMI-VOLATILE SUBSTANT RECOVERY		100
			2-FENFLUORETHYLPHENOL	%	100
			BENZ(a)ANTHRAcene-D12	%	100
			DECAFLUOROPHTHEYL	%	100

SIGNATURE

[Signature]

REPORT TO STEPHEN A. TURNER
AUTHORIZATION 446591

BILLED SEP 28 1985
In = 4742.40
O = 8766.00

MDMR

VOLATILE ORGANICS - MATRIX SPIKE RESULTS

#11

ECJ #5240009

<u>COMPOUND</u>	<u>RECOVERY (%)</u> *
benzene	128
carbon tetrachloride	147
chlorobenzene	123
1,2-dichloroethane	150
1,1,1-trichloroethane	145
1,1-dichloroethane	131
1,1,2-trichloroethane	134
1,1,2,2-tetrachloroethane	131
chloroethane	-
2-chloroethylvinylether	150
chloroform	139
1,1-dichloroethene	136
trans-1,2-dichloroethane	131
1,2-dichloropropane	127
trans-1,3-dichloropropene	-
cis-1,3-dichloropropene	-
ethylbenzene	108
methylene chloride	125
chloromethane	-
bromomethane	120
bromoform	144
bromodichloromethane	135
trichlorofluoromethane	-
dibromochloromethane	143
tetrachloroethane	128
toluene	113
trichloroethene	135
vinyl chloride	-
<u>Surrogate Recovery (%)</u>	
1,2-dichloroethane-d4	125
benzene-d6	93
p-bromofluorobenzene	104

* spiked at 20 ug/l

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REPORT OF ANALYSIS

State of Michigan
ATTN: C. Menovska
Environ. Services Div.
P.O. Box 30020
Lansing, MI

Samples Rec'd: 8/28/85
Date Reported: 9/25/85
Project No.: 4465-91
Lab No.: 5240001-012

SAMPLE IDENTIFICATION

PARAMETER	Client	14S	17S	10D	15S	15D
	Lab	5240001	5240002	5240003	5240004	5240005

Carbonate	0.01	0.01	0.30	0.07	0.05
Bicarbonate	160	90	160	240	160

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REPORT OF ANALYSIS - PAGE 2 OF 3

PARAMETER	SAMPLE IDENTIFICATION				
	Client				
	17D	22	16	11	14D
	Lab	5240006	5240007	5240008	5240009 5240010

Carbonate 0.01 * 0.34 0.27 0.009/0.009

Bicarbonate 81 * 120 140 120/120

* pH data was not available

Results expressed in mg/l unless otherwise noted.

E.C. JORDAN CO.

Supervisor

Supplemental Information

Sampling Site:

Sampled By:

Authorization:

Analytical Methods: 1. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020, U.S. Environmental Protection Agency, March 1979.
2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
3. Others as designated.

E.C. JORDAN CO.

CONSULTING ENGINEERS
562 CONGRESS STREET / P.O. BOX 7060 • PORTLAND, MAINE 04112
(207) 775-6401 / TELEX: 94-4329

REPORT OF ANALYSIS - PAGE 3 OF 3

SAMPLE IDENTIFICATION

PARAMETER	Client	23	12
	Lab	5240011	5240012

Carbonate	*	0.30
Bicarbonate	*	130

* pH data was not available

Results expressed in mg/l unless otherwise noted.

E.C. JORDAN CO.

Supervisor

Richard A. Rozene

Supplemental Information

Sampling Site: As Noted

Sampled By: ECJ

Authorization: 4465-91

Analytical Methods:

1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-78-020, U.S. Environmental Protection Agency, March 1978.
2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
3. Others as designated.

E.C. JORDAN CO.

CONSULTING ENGINEERS
582 CONGRESS STREET / P.O. BOX 7080 • PORTLAND, MAINE 04112
(207) 775-6401 / TELEX: 84-4328

REPORT OF ANALYSIS

State of Michigan
ATTN: C. Manowska
Environ. Services Div.
P.O. Box 30020
Lansing, MI

Samples Rec'd: 8/28/85
Date Reported: 10/4/85
Project No.: 4465-91
Lab No.: 5240001 - 5240012

SAMPLE IDENTIFICATION

PARAMETER	Client	14S	17S	10D	15S	15D
	Lab	5240001	5240002	5240003	5240004	5240005
Antimony, mg/l		<0.005	<0.005	<0.005	<0.005	<0.005

EC.JORDAN CO.

CONSULTING ENGINEERS
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(207) 775-8401 / TELEX: 94-4338

REPORT OF ANALYSIS - PAGE 2 OF 3

SAMPLE IDENTIFICATION

PARAMETER	Client					
		17D	22	16	11	14D
	Lab	5240006	5240007	5240008	5240009	5240010

Antimony, mg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005*
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* Duplicate analysis

Results expressed in mg/l unless otherwise noted.

EC.JORDAN CO.

Supervisor

Supplemental Information

Sampling Site

Sampled By:

Authorization:

Analytical Methods:

1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-79-020, U.S. Environmental Protection Agency, March 1978.
2. Guidelines Establishing Test Procedures for the Analysis of Pollutants: Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1978.
3. Others as designated.

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CONSULTING ENGINEERS
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REPORT OF ANALYSIS - PAGE 3 OF 3

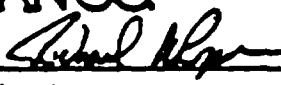
SAMPLE IDENTIFICATION

PARAMETER	Client	
	23	12
	Lab	
	5240011	5240012

Antimony, mg/l <0.005 <0.005

Results expressed in mg/l unless otherwise noted.

EC JORDAN CO.


Supervisor Richard A. Rozema

Supplemental Information

Sampling Site: As Noted
Sampled By: ECJ
Authorization: 4465-91

Analytical Methods: 1. Methods for Chemical Analysis of Water and Wastes. EPA-800/4-79-020, U.S. Environmental Protection Agency, March 1978.
 2. Guidelines Establishing Test Procedures for the Analysis of Pollutants; Proposed Regulations. Part III, Federal Register, Vol. 44, No. 233, Dec. 3, 1979.
 3. Others as designated.

CHAIN OF CUSTODY RECORD

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