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Subsurface Glacial Geology of the Area Between the Tekonsha and Kalamazoo Moraines, Kalamazoo County, Michigan

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SUBSURFACE GLACIAL GEOLOGY OF THE AREA BETWEEN THE TEKONSHA AND KALAMAZOO MORAINES, KALAMAZOO COUNTY, MICHIGAN

by

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Cross sections profiling the stratigraphy of the glacial sediments were created using the geological logs recorded on water well records. Glacial sediments in the study area comprise a large outwash complex between two moraines. The surficial landforms are the result of the last Wisconsinan advance and retreat through the area.

Cross sections contructed for this project reveal at least three major till units. An additional till unit contains a weathered soil sequence. Therefore, it is possible that this paleosol represents the Sangamon Interglacial period between the Wisconsinan and Illinoian stages. No obvious evidence of movement of the Saginaw Lobe remains in the study area with the exception of clayey till found on the Wakeshma till plain. Any till deposited by movement of this relatively thin ice lobe may have been obliterated by subsequent erosional action of ice and meltwater. Two till units overlying the older till represent two advances of the Lake Michigan Lobe through the area. Deposition of the Tekonsha Moraine by these two advances appears to have been controlled by bedrock topography. Absence of till in the southwest portion of the study area indicates rapid ice movement and powerful meltwater action in this area. What has previously been mapped as the Sturgis Moraine in this area may actually be a push moraine resulting from the second advance of the Lake Michigan Lobe.

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CHAPTER I

INTRODUCTION

Purpose and Objectives

Numerous investigations that describe the surficial landforms and glacial deposits of Kalamazoo County have been undertaken. Although the landforms in the county are relatively young and well preserved, the glacial history is not yet well understood. The purpose of this study is to analyze the subsurface glacial stratigraphy and its relationship to surficial deposits and landforms in order to better understand the distribution of deposits and glacial history of the area.

Location of the Study Area

The study area is located primarily in Kalamazoo County in southwestern Michigan and includes the northwestern portion of St. Joseph County and southeastern portion of Van Buren County (Figure 1). The boundaries of the study area are roughly delineated by surficial glacial features (Figure 2). The Kalamazoo Moraine is on the western border, the Wakeshma till plain is on the eastern border, and the Kalamazoo River valley is along the northern border of the study area. The southern boundary extends approximately three miles into St. Joseph County. The area covers approximately 280 square miles.

Surface water drainage in the area includes the Kalamazoo River basin in the northern part of the area, the St. Joseph River basin in the southern part of the area,

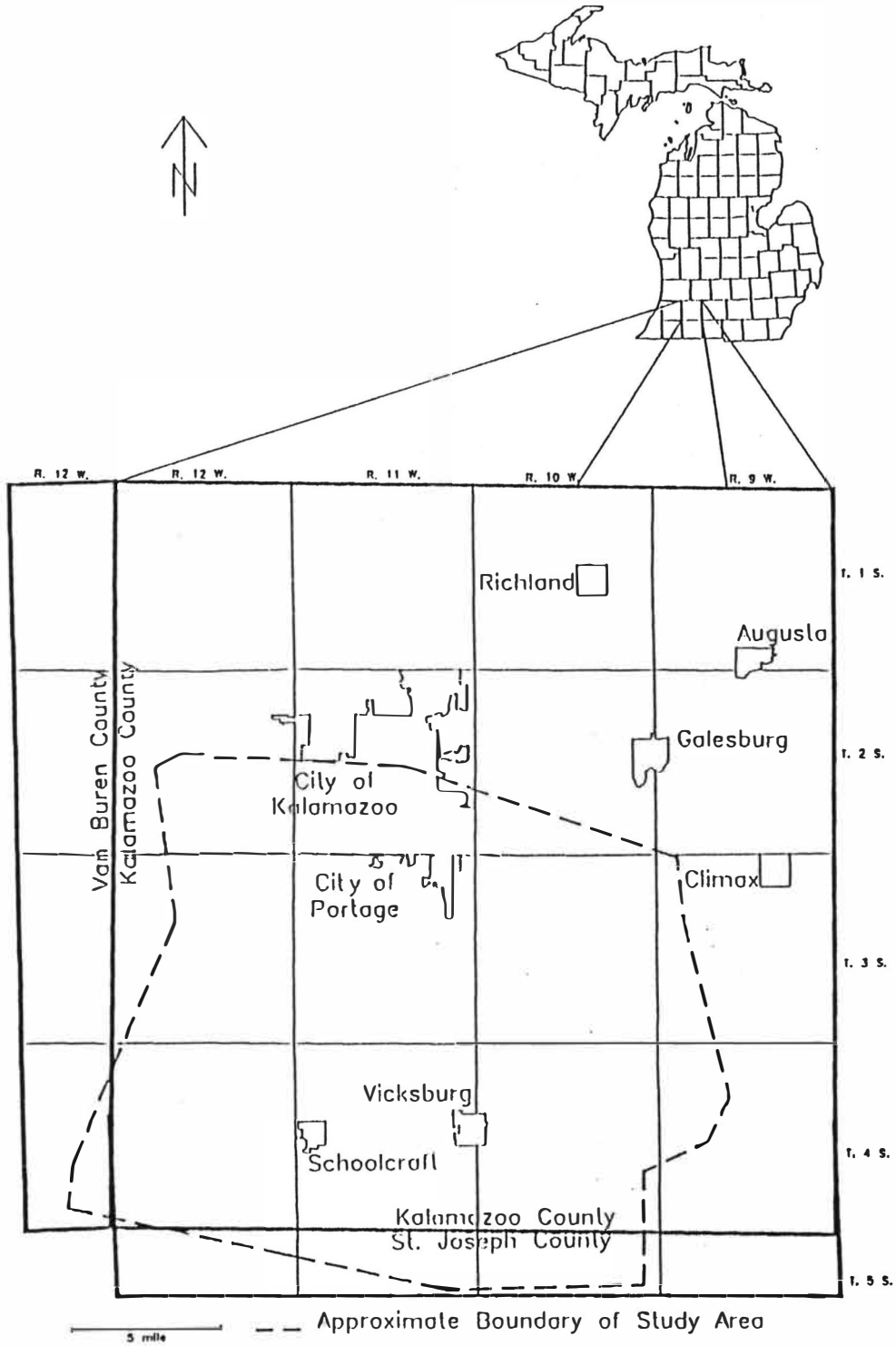


Figure 1. Location of Study Area.

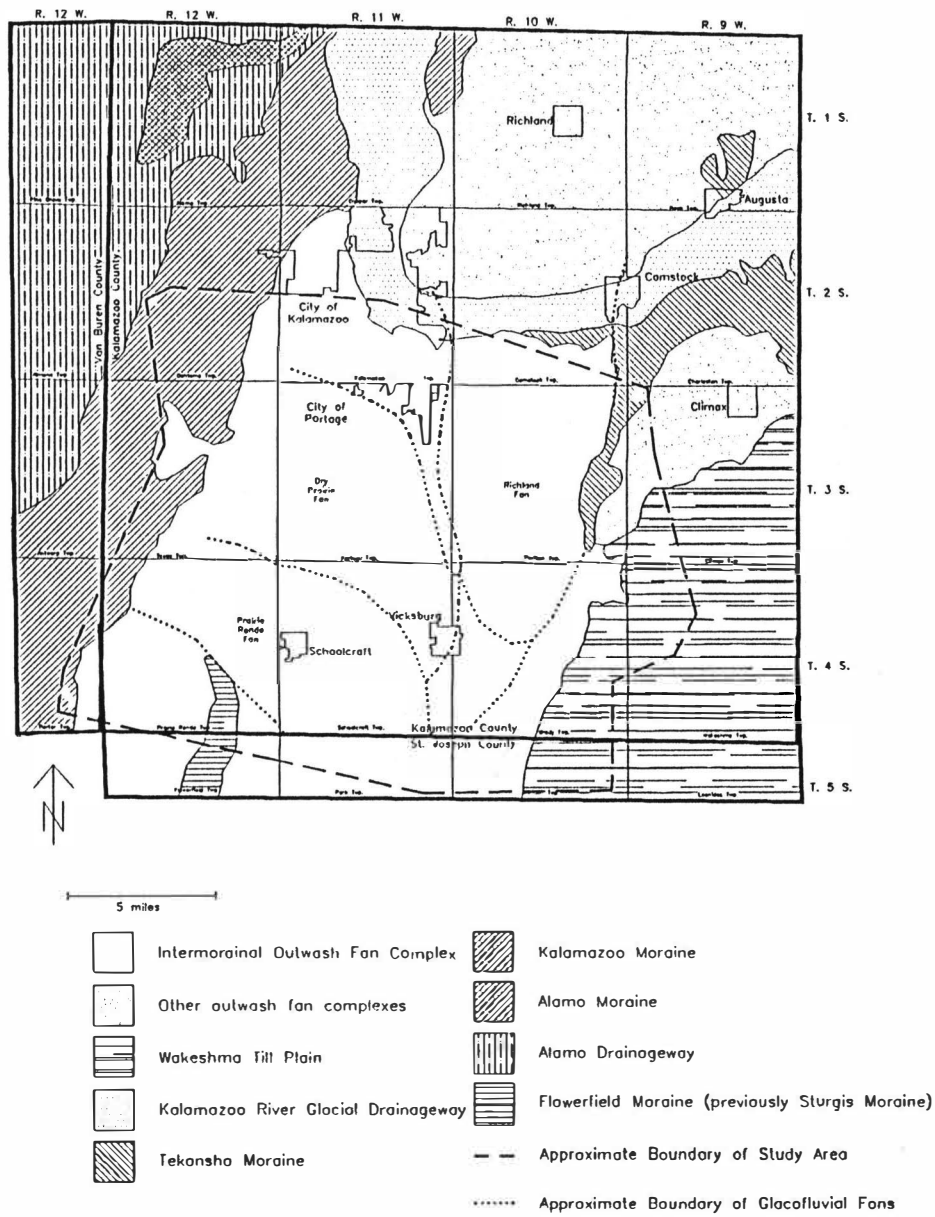


Figure 2. Map of Surficial Glacial Features (modified from Martin, 1955; Shah, 1971).

Source: Martin, H., 1958, Outline of the geologic history of Kalamazoo County: miscellaneous report of the Michigan Geological Survey.
Shah, B.P., 1971, Evaluation of natural aggregates in Kalamazoo County and vicinity: Unpublished Ph.D. dissertation, Department of Geology, Michigan State University, East Lansing, 187 p.

and the Paw Paw River basin in the extreme western portion of the area. There are numerous lakes and ponds in Kalamazoo County (Figure 3), many of which follow a southwest-northeast linear trend. The climate of the area is described as continental, but is modified by a "lake effect" due to its position relative to Lake Michigan. This large expanse of water tends to alter the weather by increasing moisture content and moderating temperatures.

Brief Description of the Study Area

Kalamazoo County lies in a notable location in regard to glacial geology. The county is located within a reentrant between the Lake Michigan Lobe and Saginaw Lobe of the Late Wisconsinan Laurentide Ice Sheet. With the exception of recent alluvial deposits, the surficial deposits in the county are the result of a major retreat of the ice sheet during the Cary Substage of the Wisconsinan (Shah, 1971).

Topography varies depending on the glacial morphology (U.S. Geological Survey, 1967a, 1967b, 1967c, 1967d, and 1982). The Kalamazoo and Tekonsha Moraines, located on the western and eastern margins of the study area, respectively, are hummocky with the classic "knob and kettle" topography produced by melting and collapse of buried, stagnant ice. The highest point is located in the northwest corner of the study area on the Kalamazoo Moraine where elevations reach 1000 feet above mean sea level (msl) (Figure 4). Relief on the moraine is as much as 50 to 75 feet above kettle depressions. The elevation of the Tekonsha Moraine ranges from approximately 925 to over 1,000 feet above msl. An elevated area in southwest Prairie Ronde Township, which has been mapped as the Sturgis Moraine (Leverett, 1915; Martin, 1955), rises about 50 feet above the surrounding outwash apron to elevations of 850 to 900 feet above msl.

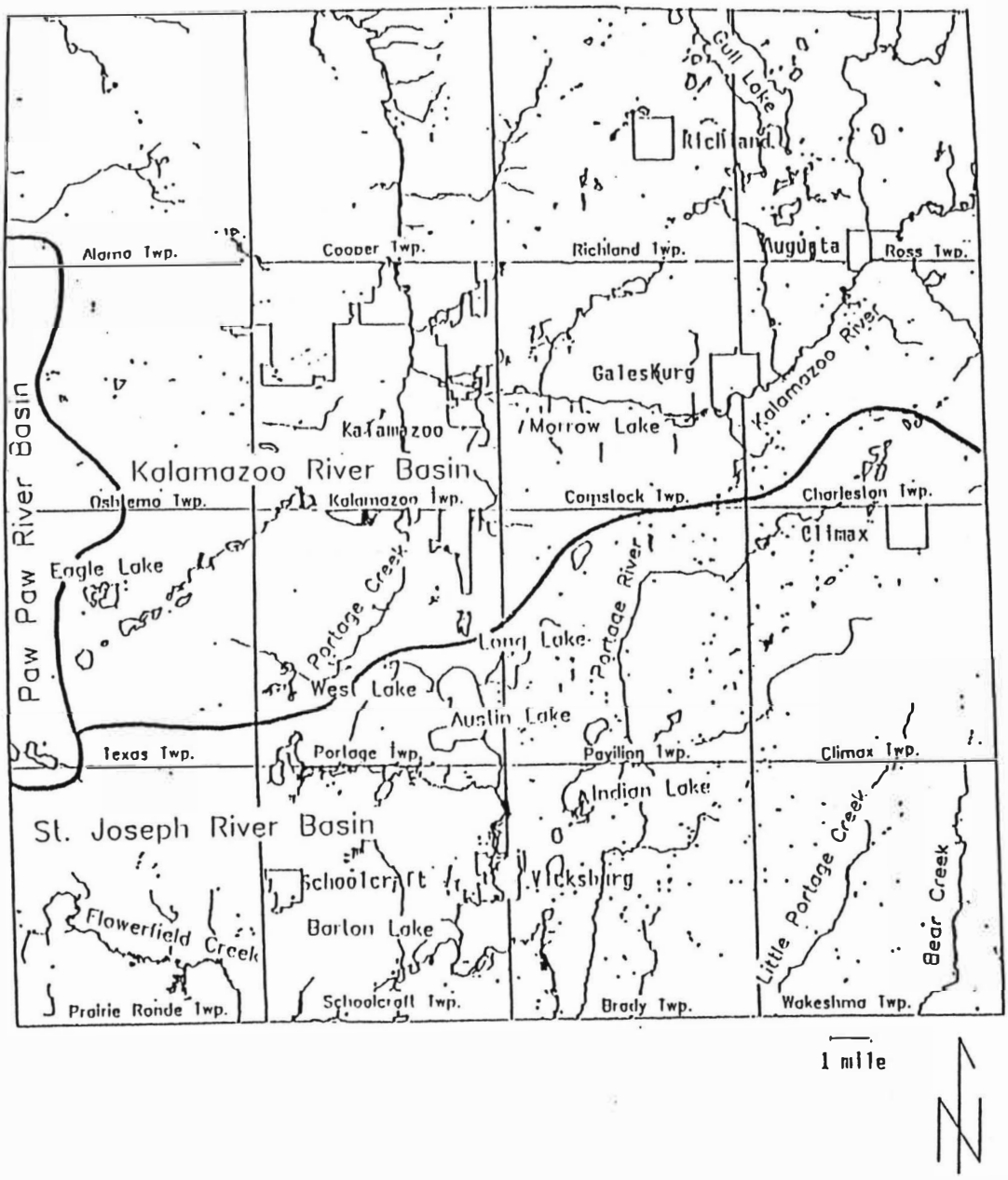
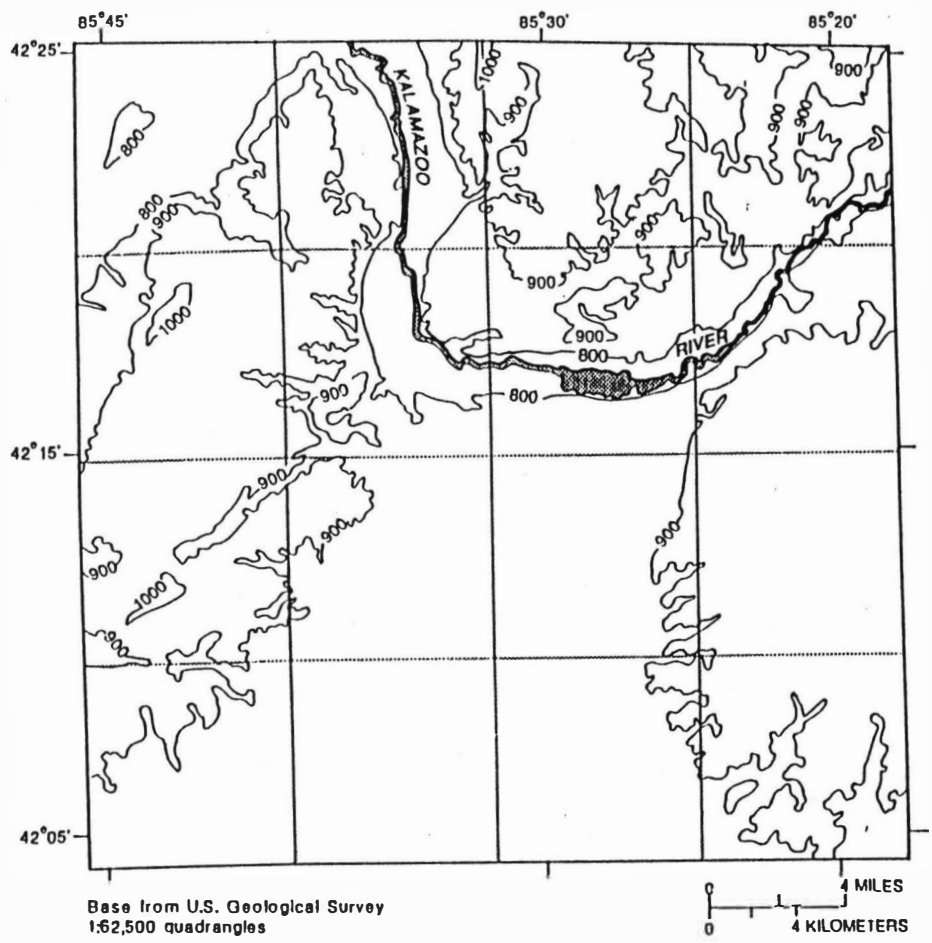


Figure 3. Map of Surface Water Features in Kalamazoo County (digitized map from the Michigan Resource Inventory System, MIRIS Groundwater Database).

Source: MIRIS Groundwater Database, Michigan Department of Natural Resources, Lansing, Michigan.



EXPLANATION

—900— TOPOGRAPHIC CONTOUR--Shows elevation of land surface. Contour interval 100 feet. Datum is sea level

Figure 4. Map of Topography of Kalamazoo County (Rheaume, 1990).

Source: Rheaume, S.J., 1990, Geohydrology and water quality of Kalamazoo County, Michigan, 1986-1988: U.S. Geological Survey Water-Resources Investigations Report 90-4028, 102 p.

The topography of the Wakeshma till plain, located in Wakeshma Township and extending into the western portion of Brady Township of Kalamazoo County, can be described as undulating. This plain contains elevated, southwest trending drumlinoids that rise between 10 and 40 feet above the surrounding till plain and occasional outwash channels.

The topography of the outwash complex between the two moraines, which comprises most of the study area is gently rolling to flat. Elevations in the northern part of the study area are near 900 feet above msl and decrease towards the south to less than 850 feet above msl in St. Joseph County. The relief changes noticeably in Portage, Kalamazoo and western Pavilion Townships. Here, in the north central portion of the study area, the relief becomes much more pronounced reaching 50 feet or more.

The glacial thickness in the study area ranges from 50 feet to as much as 500 feet (Figure 5). The bedrock formation underlying the glacial sediments in the study area is the Mississippian Coldwater Shale. This shale is characterized as being gray and bluish-gray and is approximately 500 to 600 feet thick in this area (Lillienthal, 1978).

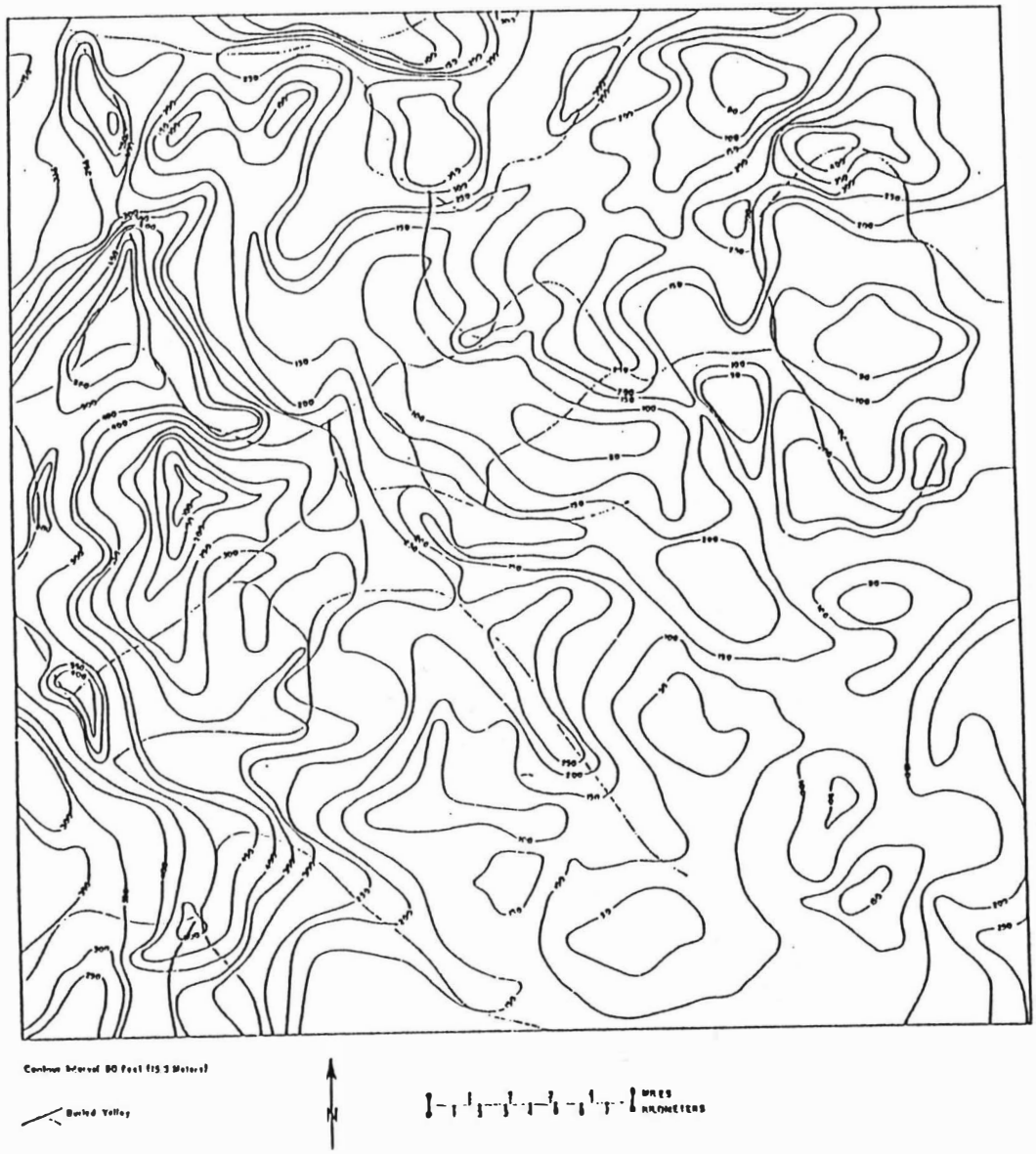


Figure 5. Map of Drift Thickness (Western Michigan University, 1978).

Source: Western Michigan University, 1978, Kalamazoo County geology and the environment: Departments of Geology, Geography, and Biology, 144 p.

CHAPTER II

METHODS OF STUDY

Water Well Records

A database consisting of water well and pumping records is maintained by the Kalamazoo County Human Services Department. The water well and pumping records include information for existing or previously existing residential drinking water wells, municipal water supply wells, wells used for industrial and agricultural purposes, and test and monitoring wells. The data provided on each boring log include location and ownership of wells, pump information, depth to ground water, and lithological descriptions generally recorded during drilling activities. The Department of Human Services of Kalamazoo County is in the process of constructing a computer database based on water well record data. Well records for Van Buren and some for St. Joseph Counties have also been input into a computer database. Boring logs not yet input into the computer system by the counties, including municipal wells from the City of Kalamazoo, observation wells from the City of Portage, some monitoring wells at the KL Avenue Landfill, observation wells at The Upjohn Company in Portage, and Western Michigan University Department of Geology test wells emplaced at various locations throughout Prairie Ronde and Schoolcraft Townships and the Asylum Lake area in Kalamazoo Township, were collected and input into the computer database as part of this study.

Each well input into the database is given a unique eleven digit identification number. The identification number is made up of a series of codes which identify

the general location where the well was installed. The first two digits are a code used to identify the county. Kalamazoo County is denoted by the two digit number 39, St. Joseph County by 75, and Van Buren County is denoted by 80. The next four numbers are township codes, and the following two numbers are section numbers. The last three digits pertain to a unique number assigned to the well to distinguish the identification number from other numbers in that section. The last three digit code numbers the well sequentially from 001. In order to avoid duplicate well identification numbers between wells input by the county and wells that were input by the author specifically for this study, some well identification numbers may not follow the three digit sequential coding exactly.

Although the database provides a vast number of records, a quality control check was performed prior to using any record for the study. Boring logs were screened for the deepest and most detailed lithologic descriptions. Generally, only deeper wells were useful to the study. Because the lithologic descriptions are made by different persons and field descriptions of similar material tend to differ, a subjective analysis of reliability of the lithologic descriptions was performed. This was done by comparing boring logs of nearby wells and checking for anomalies.

A visual inspection of the boring logs was performed in order to obtain familiarization of an area, to select wells for detailed observation, and to select wells for cross sections. Only the more apparantly reliable well records were incorporated into the cross sections described below.

Cross Sections

In order to obtain an understanding of the glacial stratigraphy of the study area, two different sets of cross sections were made. One set consists of cross

sections transecting each of the study area townships located within Kalamazoo County. Generally there were six east-west cross sections and six north-south sections for each township. When possible, one boring log per section was selected based upon depth and detail of the boring logs. Formal correlations of stratigraphic units from boring to boring were generally not made on these shorter cross sections; only relative location, both vertical and horizontal, are depicted. These cross sections, referred to as the short cross sections, were used as an audit of the longer, more detailed cross sections described below. The short cross sections are provided in Appendix A.

Longer cross sections that transect the entire study area were created using carefully selected well records. These sections were made from records of wells that were logged by the U.S. Geological Survey, W.M.U. Geology Department, trained geologists or engineers in area environmental consulting firms, or records that were selected because their reliability was easily checked by comparison with logs in close proximity (e.g., a municipal well field). Boring logs of wells which also were natural gamma logged were chosen when possible. Clays and shales naturally emit more gamma radiation than sand and gravel, and this increased radioactivity is recorded using a downhole probe. The gamma logs are therefore useful for stratigraphic correlation of till and clay units (Baldwin and Miller, 1979). Domestic water well boring logs, which are generally recorded by the driller during well installation, were also used for the purpose of showing continuous correlation between the selected wells. Boring logs used to create the longer cross sections are included in Appendix B.

Glacial stratigraphic units were determined based upon the amount of clay relative to other sediments. Material that was described as having only clay was

simply categorized as clay. Material that had been logged as clay with any other sediment, such as sand, gravel, or silt, was labelled till. Material that was devoid of any clay was labeled as outwash. Till and clay, although distinguished, were generally correlated together in the cross sections. This generalization of glacial sediments was done to reduce discrepancies of logs recorded by different persons and to create an objective description of the material. Although generalization simplifies the complex glacial geology of the study area, it was necessary to perform the more regional correlations attempted in this study.

For interpretation of the longer cross sections, outwash and till units were used to identify ice movement through the study area. Outwash includes both proglacial and ice-contact glaciofluvial sediments. The ice-contact deposits are usually recognized by association with topographic ridges or adjacent till units (Anderson, 1989). Till may be subdivided into basal and supraglacial types. Basal till (lodgement or basal melt-out) is deposited directly beneath the ice and is therefore very useful in interpreting the glacial history of an area. Supraglacial (ablation) till is formed within or on top of the glacier. The two till types can sometimes be distinguished by the greater thickness and uniformity of the basal till and by the presence of numerous sand and gravel lenses in the supraglacial till (Anderson, 1989).

The estimated bedrock surface was included on the cross sections. This surface was either known from water-well records or oil-well records, or inferred from a bedrock topographic map of the county created on the basis of geophysical techniques (Ibrahim, 1970) (Figure 6). In addition, the generalized surface topography was determined from U.S. Geological Survey topographic maps and drawn on the cross sections.

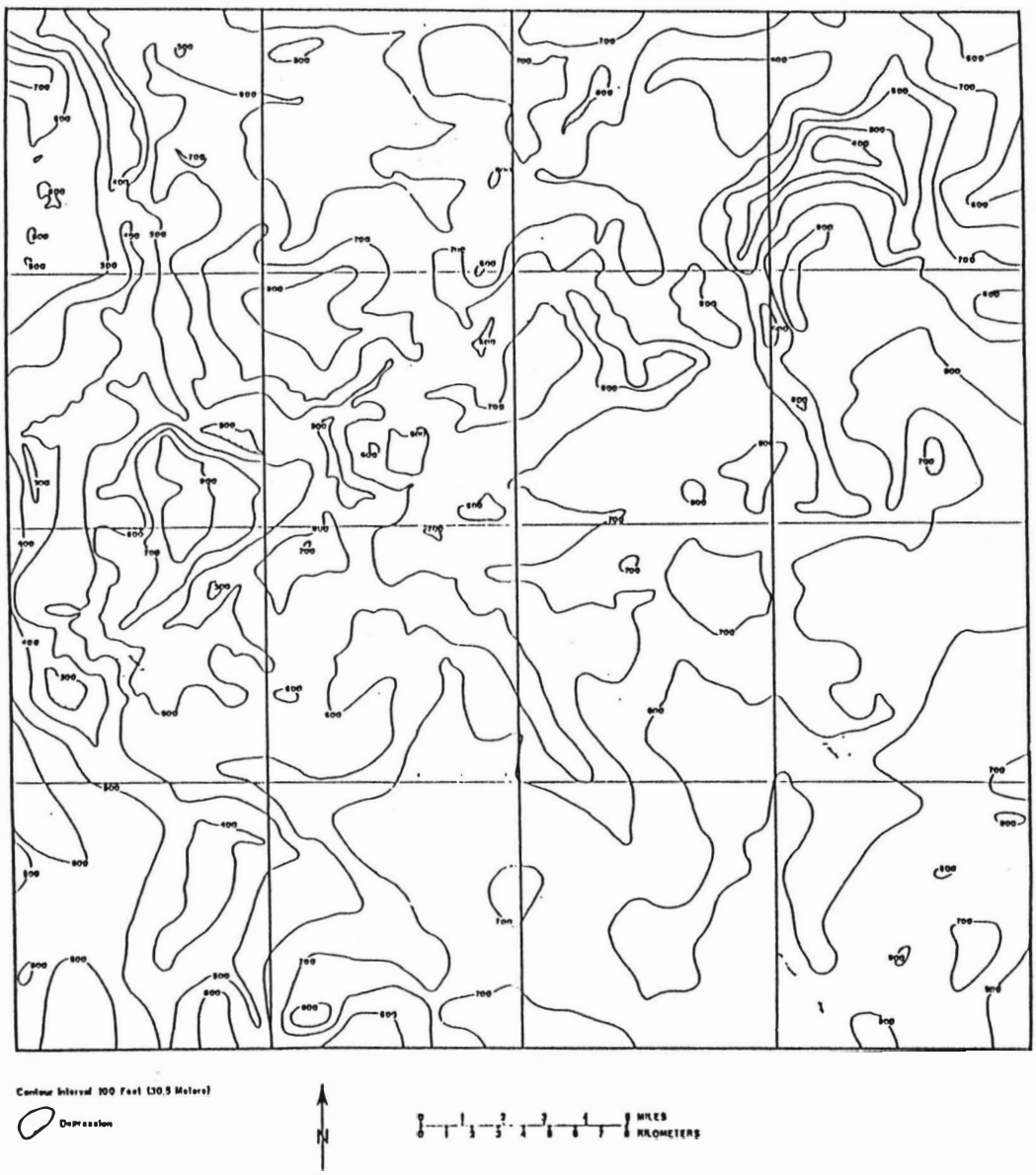


Figure 6. Map of Bedrock Topography (Western Michigan University, 1978; originally adapted from Ibrahim, 1970).

Source: Western Michigan University, 1978, Kalamazoo County geology and the environment: Departments of Geology, Geography, and Biology, 144 p. Ibrahim, A., 1970, The application of gravity method to mapping bedrock in Kalamazoo County, Michigan: Unpublished Ph.D. dissertation, Department of Geology, Michigan State University, East Lansing.

CHAPTER III

REVIEW OF LITERATURE

Related Studies

Leverett and Taylor (1915) performed the first extensive study of the glaciated area throughout Michigan and Indiana. Their investigation consisted of close scrutiny of moraines and other glacial landforms. They identified landforms resulting from the Lake Michigan Lobe and Saginaw Lobe, as well as other lobes of the Laurentide Ice Sheet and, in doing so, suggested the relative timing of deposition of these landforms.

Numerous other authors have undertaken the effort to define the sequence of glacial events in Michigan through studies of the drift stratigraphy (Acomb, Mickelson, and Evenson, 1982; Dreimanis, 1977; Frye and Willman, 1960; Zumberge, 1969). Monaghan, Larson, and Gephart (1986) attempted to correlate surficial morainal deposits of the Lake Michigan Lobe in southwest Michigan with tills encountered in the subsurface. These correlations were based upon mineral analysis of the clay contained in the till. Monaghan and Larson (1986) made the same endeavor with morainal deposits and subsurface tills of the Saginaw Lobe.

More specific to the study area, Terwilliger (1954) described the development of glacial features in Van Buren County. Martin (1957) proposed the relative timing of deposition of the landforms within Kalamazoo County. Shah (1971) described the glacial sediments in the county and made further attempt to define the relative timing of deposition of the landforms. He also proposed the

location of the interlobate boundary between the Lake Michigan and Saginaw Lobes in the county based on the detailed description of aggregates. Lovan (1977) also delineated the location of the interlobate boundary within Kalamazoo County based upon heavy mineral and clay mineral analysis.

Other works pertinent to the study area include investigations of specific glacial features. Melbardis (1991) studied the hydrogeology, and briefly, the glacial geology of the Tekonsha Moraine in Charleston Township. Steinmann (1994) detailed the outwash material of the Prairie Ronde fan, in the southwest portion of the study area. Straw (1976) described several glacial features within the central portion of Kalamazoo County and suggests mode of deposition for these features.

Glacial History

It is generally agreed that the landforms in the study area are a result of the retreat of the Laurentide Ice Sheet during the Cary Substage or late Woodfordian Stage of the Wisconsinan (Leighton, 1933; Zumberge, 1960; Frye and Willman, 1970). During this stage, the ice sheet completely covered Michigan at about 24,000 years B.P. (Farrand and Eschman, 1974). The ice reached it's Late Wisconsinan maximum southern extent approximately 21,000 to 18,200 years ago (Dreimanis, 1977). At that time, the ice stood nearly at the position of the present Ohio River Valley (Figure 7).

The retreat of the ice sheet was characterized by ice margin oscillations. At the earliest part of the Cary Substage, the ice had already separated into lobes with axes in the Lake Michigan, Saginaw Bay, and Lake Erie basins (Farrand and Eschman, 1974). The fronts of each of these ice lobes moved rather independently. Approximately 15,000 years ago, at the beginning of the Cary Substage, the ice fronts of the Lake Michigan, Saginaw, and Lake Erie Lobes were positioned at the approximate locations

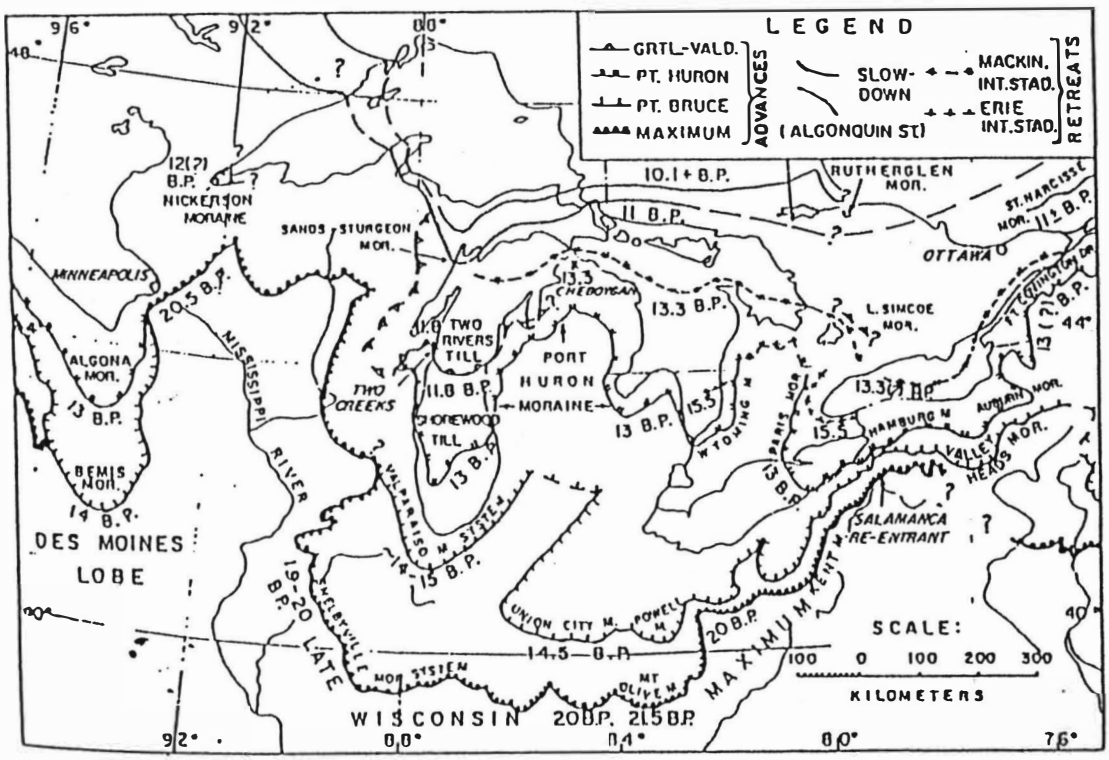


Figure 7. Maximum Extent of Wisconsinan Advance of Ice (Dreimanis, 1977).

Source: Dreimanis, A., 1977, Late Wisconsinan glacial retreat in the Great Lakes region, North America: New York Academy of Science Annals, v. 288, pp. 70-89.

of the Minooka and Marseilles Moraines in Illinois and the Iroquois, Union City, and Packerton Moraines in Indiana (Zumberge, 1960). This, however, is disputed (Dreimanis, 1977; Monaghan and Larson, 1986) as there is postulation that the Cary Substage began after the Erie Interstade (Morner and Dreimanis, 1973) with the ice fronts of the respective lobes positioned at the Powell Moraine in Indiana and the Kalamazoo and Sturgis Moraines in Michigan, and possibly at the Valparaiso System in Illinois.

Apart from the dispute about the exact timing of the Cary Substage, it has been generally agreed that the Saginaw Lobe was the first to retreat through Kalamazoo County. Leverett (1915) hypothesized that the higher relief of the area over which the Saginaw Lobe traveled caused the ice in this lobe to be relatively thinner than that of the Lake Michigan Lobe. Therefore, the retreat of the Saginaw Lobe may have been much quicker than that of the Lake Michigan Lobe. After stagnating to deposit the sediments comprising the Sturgis Moraine in St. Joseph County, the Saginaw Lobe retreated through the southeastern portion of Kalamazoo County depositing the sediments of the Wakeshma Till Plain (Martin, 1957).

The Wakeshma till plain covers Wakeshma Township and extends into Climax, Pavilion, and Brady Townships on the west, and into Calhoun and St. Joseph Counties on the east and south. It is bordered on the north by an outwash fan complex. The till plain consists of a surficial clayey till with numerous boulders and cobbles (Shah, 1971). The topography can be described as gently undulating. The till plain is transected by numerous drainageways and outwash channels and is characterized by the existence of drumlins. Martin (1957) states that the drumlins formed as the Saginaw ice moved from the position of the Sturgis Moraine northward to the position of the Tekonsha Moraine. Shah (1971) claims that the drumlins in the Wakeshma Till

Plain were formed after deposition of the sediments of the Tekonsha Moraine by readvance of the ice lobe over the Tekonsha Moraine onto the till plain to an area southeast of the county.

The Tekonsha Moraine trends east-west through eastern Charleston Township then turns to a northeast-southwest orientation through Pavilion and Brady Townships. The morainal sediments consist of thick layers of clay till and interbedded till and glaciofluvial sediments up to 150 feet thick overlain by 30 to 50 feet of sand and gravel (Shah, 1971; Melbardis, 1991). The east-west trending portion of the Tekonsha Moraine rises more than 100 feet above the bottom of the Kalamazoo River Valley to the north (Leverett and Taylor, 1915), but the change in elevation is much more subtle onto the fan to the south. The northeast-southwest trending segment of the moraine is somewhat lower and has been interpreted to be an end moraine of the Lake Michigan Lobe, deposited at the time when the Saginaw Lobe was readvancing over the Wakeshma Till Plain to the east (Shah, 1971). The southeastern extension of this arm of the Tekonsha Moraine is believed to have been buried by subsequent outwash events (Straw, 1991).

The relative timing of the formation of this northeast-southwest trending segment of the Tekonsha Moraine and the Kalamazoo Moraine is in dispute. Shah (1971) postulates that the Lake Michigan Lobe first formed the Kalamazoo Moraine and then later overrode it to form the northeast trending segment of the Tekonsha Moraine. He claims, furthermore, that the Lake Michigan Lobe had to override the Alamo Moraine, found in Alamo Township in northwest Kalamazoo County, which was formed by the Saginaw Lobe prior to the deposition of the sediments of the Wakeshma till plain. Martin (1957) believed that the Alamo Moraine was formed much later, resulting from the last stagnation of the Lake Michigan Lobe in its retreat

from Kalamazoo County. This agrees with Leverett's (1915) interpretation that the Alamo Moraine is a later feature of the Lake Michigan Lobe.

Another controversial feature in the county is the hummocky landform that extends southeast from Prairie Ronde Township into St. Joseph County. This has been mapped by both Martin (1955) and Shah (1971) as an extension of the Sturgis Moraine. Leverett (1915) believed this feature to be time equivalent to the Sturgis Moraine and therefore older than the Tekonsha Moraine. Monaghan et al., (1986) indicate that this may be a very outer ridge of the Kalamazoo Moraine.

Nevertheless, it is generally agreed that the Kalamazoo Moraine formed after a considerable retreat and readvancement of the Lake Michigan Lobe. The Kalamazoo Moraine covers parts of Cooper, Alamo, Oshtemo, and Texas Townships and the northwest corner of Prairie Ronde Township. This morainic system is the most prominent glacial feature in the county. The crests of the Valparaiso and Lake Border Moraines to the west are 100 feet lower in elevation. Leverett and Taylor (1915) defined two ridges, the inner and the outer, for this moraine in southern Michigan. However, as Shah (1971) notes, these two ridges are not well defined in Kalamazoo County. In some places, the two ridges merge to form one broad ridge. The moraine is dissected by the Kalamazoo River valley in Cooper Township. The morainic system is characterized by bold knob and kettle topography, in which knobs rise as much as 50 to 75 feet above kettle holes (Shah, 1971). The eastern edge of the moraine has a subtle transition into outwash to the east. The western margin is a sharp ice-contact slope with a steep drop to a lowland to the west. The very bold features of the Kalamazoo Moraine are the main reason why so many authors believe a significant retreat and readvance occurred before its formation.

Outwash deposits make up two thirds of Kalamazoo County's surficial

deposits. Recent studies have given detailed descriptions of outwash areas. Several distinct glacio-alluvial fans have been mapped in the county (Straw, 1991). One such fan, known as the Prairie Ronde fan (Steinmann, 1994) is believed to have been deposited when meltwater and outwash broke though a narrow breach in the Kalamazoo Moraine near Paw Paw Lake and deposited the material from braided streams throughout Prairie Ronde and Schoolcraft Townships. This model of a humid-type, glacially generated alluvial fan has been suggested to be the mode of deposition for at least three other outwash deposits in the county (Straw, 1991). The oldest of these fans is the Dry Prairie Fan that extends from the Kalamazoo Moraine in Oshtemo Township to south-central Schoolcraft Township and covers most of Portage Township. This fan was deposited from meltwater and outwash of the Lake Michigan Lobe. The Richland Fan was formed from meltwater and outwash from the Saginaw Ice Lobe and extends from Ross and Richland Townships to central Schoolcraft and Brady Townships. Glacio-alluvial fans are also discerned in the area between the Tekonsha Moraine and Wakeshma till plain. In general, the outwash material is coarser with proximity to the moraines.

Outwash northwest of the Kalamazoo Moraine represents a glacial drainageway, with sedimentary features implying deposition from meltwaters of both moraines (Shah, 1971). The glacial Kalamazoo River valley, likely the result of the last major glacial event in Kalamazoo County, may have formed as an erosional feature caused by catastrophic flooding (Kehew, 1991).

CHAPTER IV

RESULTS

Cross Section Locations

Twelve cross sections of the study area were created (Figure 8). The eight west-east cross sections are lettered from A to H. Cross section A-A' is the northernmost cross section through the study area, and cross section H-H' is the southernmost cross section through the study area. The four south-north cross sections are lettered from I to L. Cross section I-I' is the westernmost cross section, and cross section L-L' is the easternmost cross section.

The descriptions presented below detail the till units found in the cross sections. In describing a unit as continuous, it is meant to imply laterally extensive rather than ubiquitous. In other words, although a unit may be correlated across an area, the unit would not always occur if a boring were advanced at any point. These glacial units were correlated to delineate the glacial stratigraphy and to develop an understanding of the glacial geology of the area, and are locally discontinuous and variable due to the active and interactive nature of the ice and meltwaters.

Cross Section A-A'

Cross section A-A' transects the study area from the proximal margin of the Kalamazoo Moraine in Oshtemo Township through the outwash fan complex in Kalamazoo and Pavilion Townships and ends at the northeast-southwest trending arm

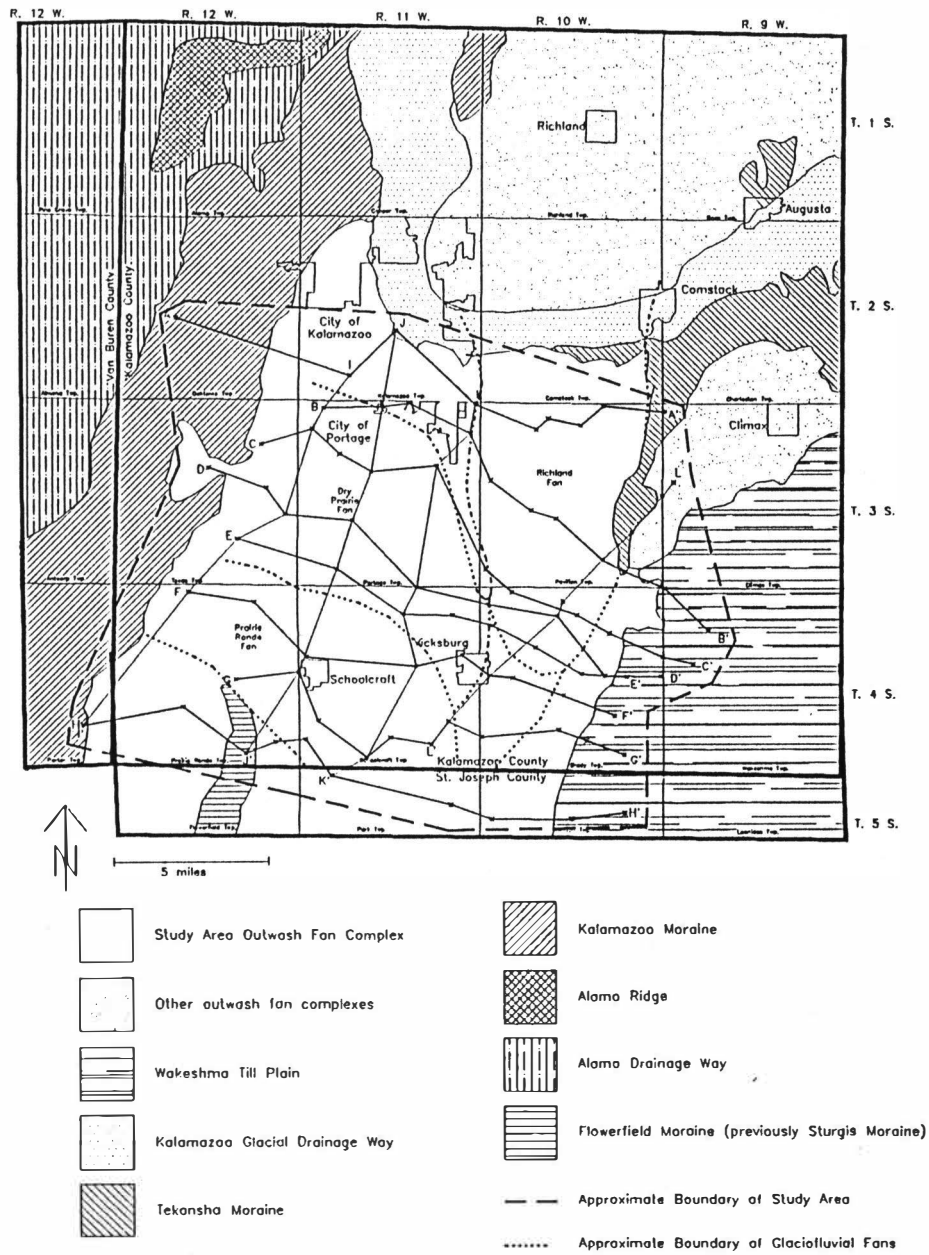


Figure 8. Map of Location of Cross Section Lines.

of the Tekonsha Moraine in Climax Township (Figure 9).

The cross section depicts four distinct till units. The far western well (A1) shows at least three till units within this area of the Kalamazoo Moraine. Nearby wells indicated complex deposition in this area with additional till units in the immediate vicinity of this well. The nearby well records also indicate that the till units may not be locally continuous. It should be noted that well records in the area suggest that a soil horizon, as evidenced by sediment weathering and wood fragments, may be developed on the lower till unit depicted in this well. The correlated till in the next well to the east, (A2) also contains a weathered horizon and peat. The degree of weathering and reddish color of this paleosol suggest that it may be the pre-Wisconsinan Sangamon paleosol. East of the Kalamazoo Moraine, this lower till layer greatly decreases in thickness. The upper two till layers appear to be continuous throughout the section.

Wells A2 and A3 indicate that till is present directly above bedrock in central Kalamazoo Township. This till appears to be deposited in a bedrock valley. It appears that bedrock may slope to a topographic low beneath the moraine, although this is most likely a valley located beneath the moraine as the bedrock topography map indicates that the moraine is generally situated on a bedrock topographic high. Another bedrock topographic high exists on the eastern portion of the section.

The eastern portion of the section depicts a till layer, approximately 50 feet thick. This till layer appears to be clay rich. The uppermost till unit appears to be present at the surface in the wells located near and on the Tekonsha Moraine and in northeast Pavilion Township.

Cross Section B-B'

Cross section B-B' transects the study area in Kalamazoo County from the

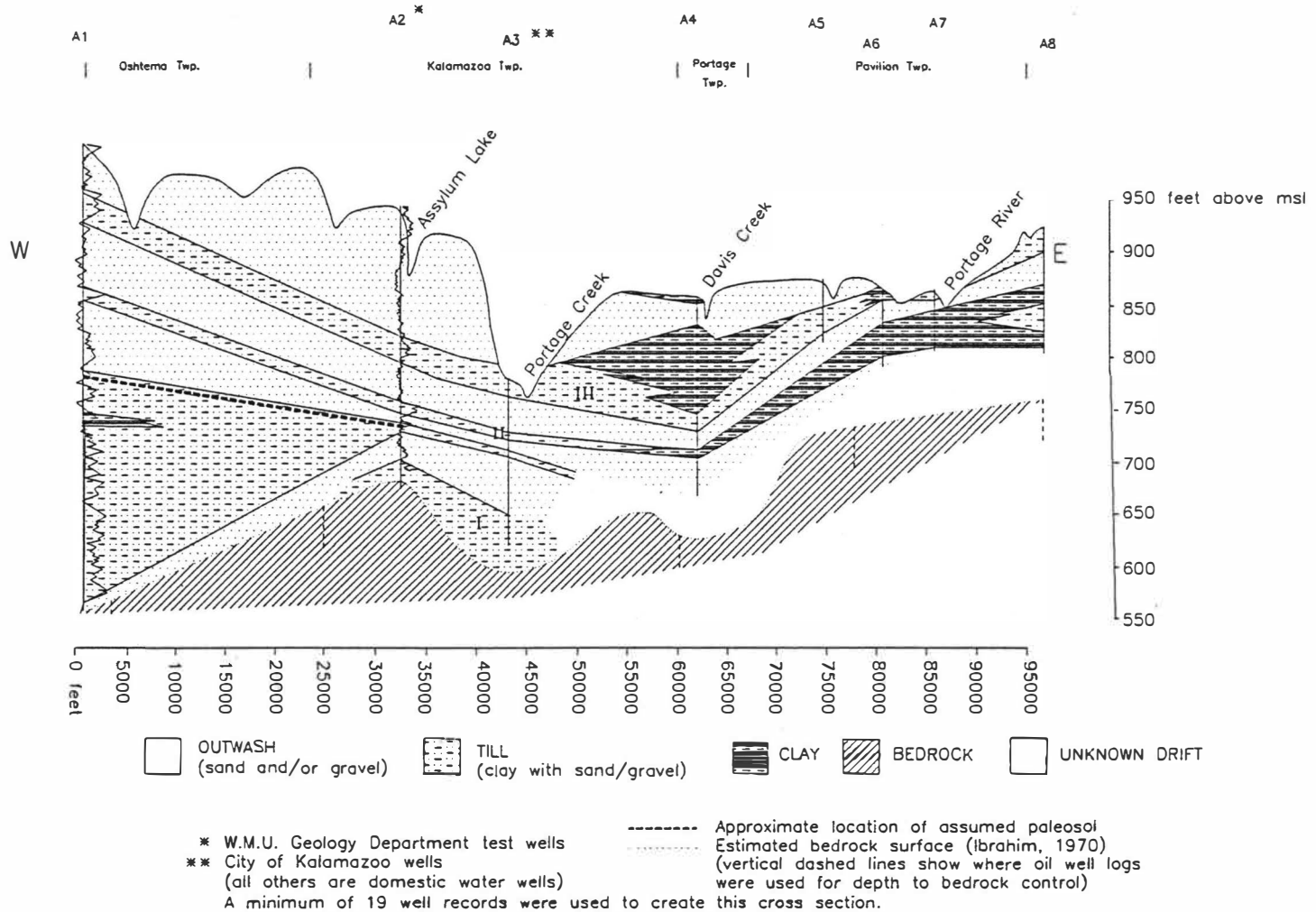


Figure 9. Cross Section A-A'.

northwest corner of Portage Township through Pavilion Township and into the Wakeshma Till Plain in Wakeshma Township (Figure 10).

The cross section depicts a complex stratigraphy of approximately four till layers. A till layer is found in well B1 at a depth of approximately 100 feet. This till layer appears to extend eastward into Pavilion Township where it appears at the surface. Its maximum thickness is about 75 feet, but varies greatly. The surficial till found in the eastern portion of the section, within the Wakeshma till plain, which is a topographically high area, extends to bedrock. A surficial till is also present at the western boundary of Pavilion Township.

A smaller lens of till in well B3 demonstrates the locally complex stratigraphy found in much of the study area. It is not uncommon to encounter occasional lenses of clay and till within areas of outwash or to find lenses of sand and gravel in till units.

Till is again found overlying bedrock in the western portion of the section. Because of the lack of deeper or bedrock wells in Pavilion Township, it is not clear how continuous this till is to the east.

Cross Section C-C'

Cross section C-C' transects the study area in Kalamazoo County from the eastern edge of the Kalamazoo Moraine into Portage Township through the southwest corner of Pavilion Township and into Brady Township. The cross section line ends in the Wakeshma till plain in Wakeshma Township (Figure 11).

This cross section depicts at least three till layers. Approximately 30 feet of till occurs at a depth of about 60 feet in well C1, located at the far western side of the section. This till layer does not extend to the next well to the east. The lower two till layers found in this well do appear to extend to the east through the remaining section.

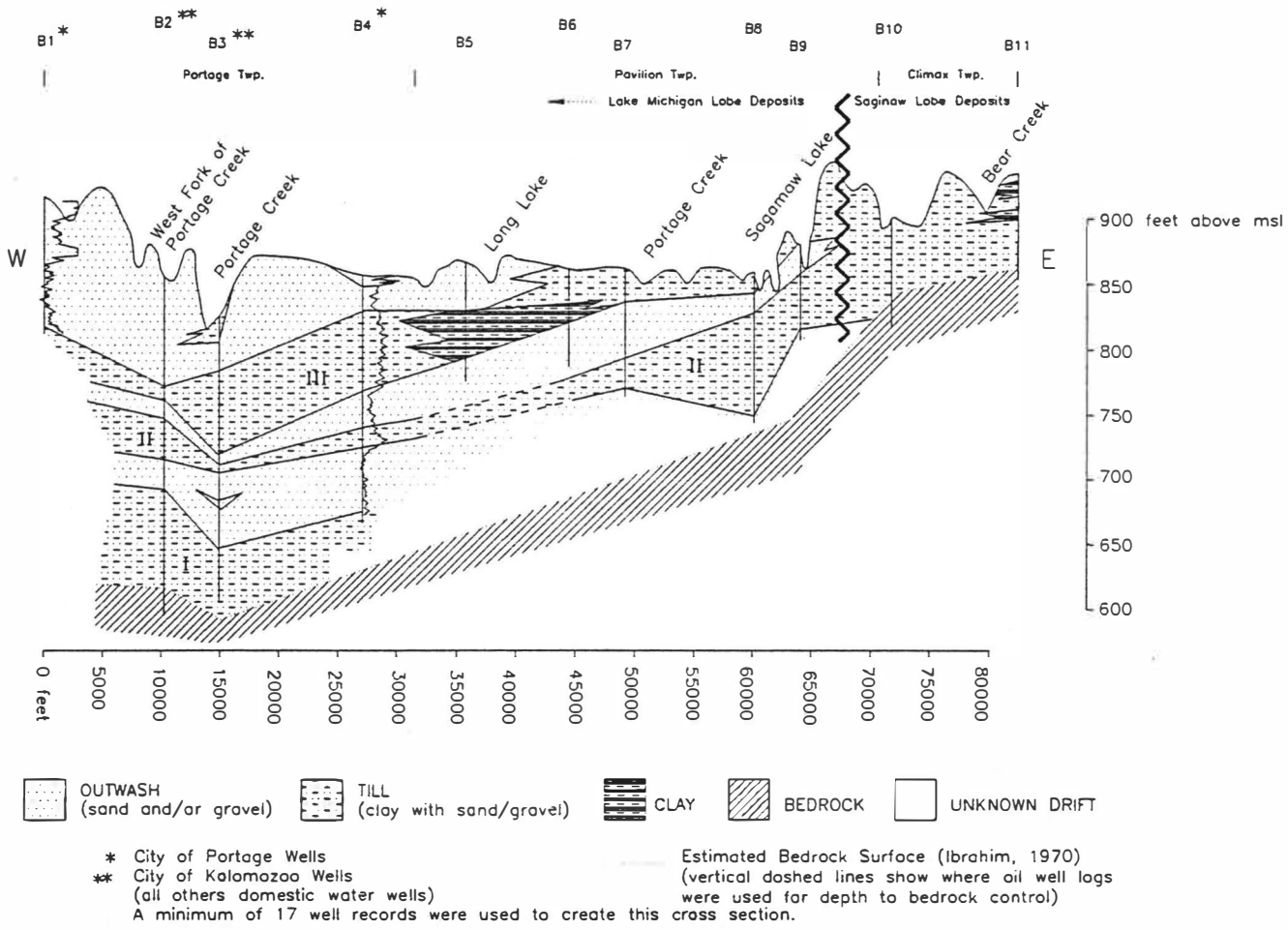


Figure 10. Cross Section B-B'.

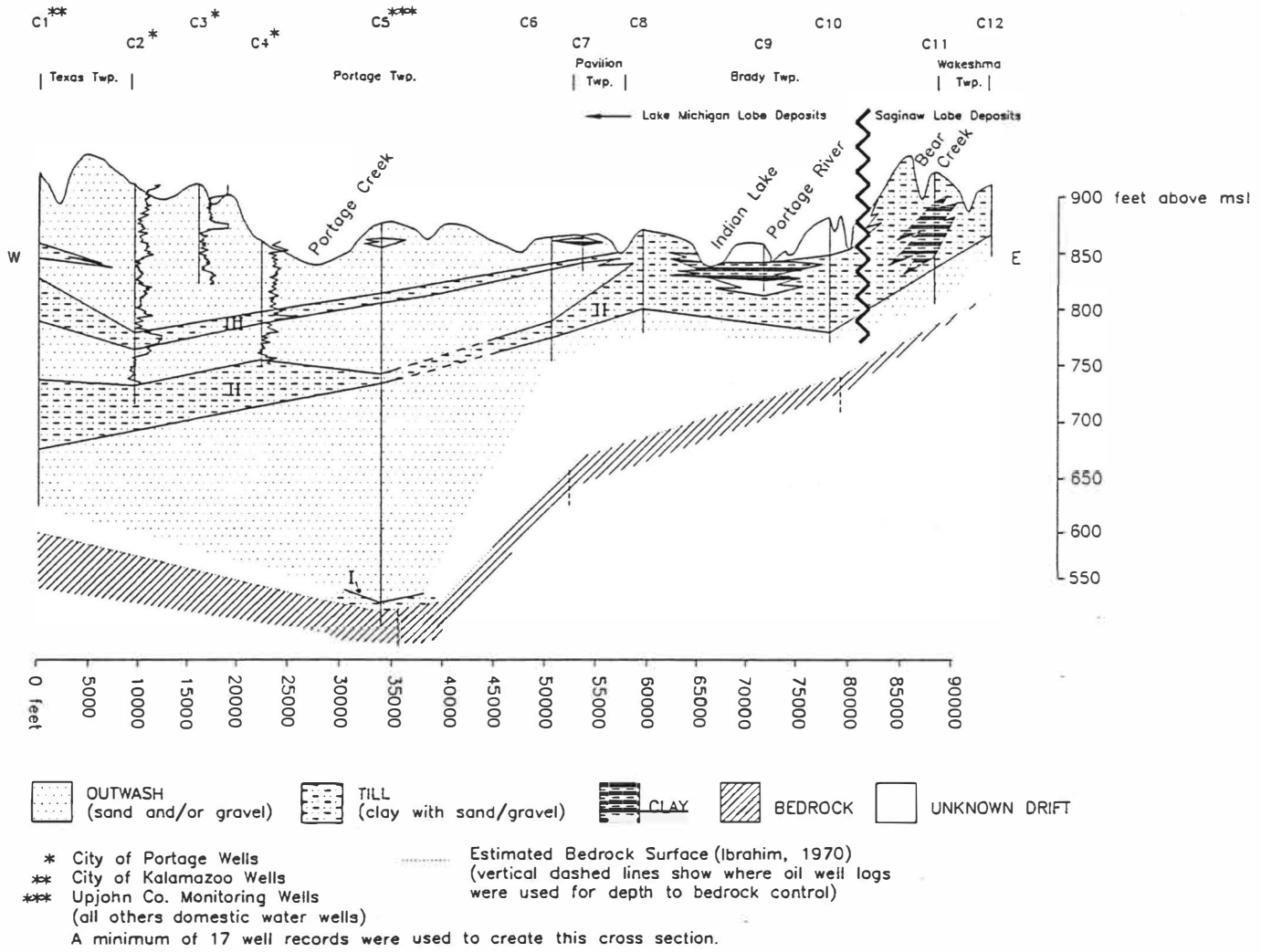


Figure 11. Cross Section C-C'.

A silty till is observed to be directly overlying bedrock in well C5, located in central Portage Township. It is not known whether bedrock is directly covered by till in the remaining areas of the section.

Surficial till is observed in well C8 in Pavilion Township and in wells located on the Wakeshma Till Plain. This till appears to have a significant clay component to the east. Till and clay lenses are observed in the surficial outwash unit in the central portion of the section.

Cross Section D-D'

Cross section D-D' transects the study area in Kalamazoo County from the Kalamazoo Moraine in Texas Township, through Portage Township, to the eastern edge of Brady Township on the Wakeshma till plain (Figure 12).

This cross section depicts a seemingly simple stratigraphy although it is unclear what would be encountered at depth in the western portion due to the lack of wells extending to depth in this area. Till is found at the surface in the far western well of the section, however, the existence of this till cannot be verified by well records of surrounding wells. This well is located in an outwash apron on the Kalamazoo Moraine. Till is also found at depth in this well, as well as surrounding wells, although this till does not appear to continue to the next well to the east.

Surficial till is found in wells located on the Wakeshma till plain, which again is assumed to overlie a bedrock topographic high. A thicker till unit, in which logs report significant clay is found at depth beneath the till plain. A thick, clayey till unit, which occurs at depth beneath the till plain can be correlated through the section to the west, where it dips beneath a higher till unit in central Portage Township. The upper till unit does not extend to the next well to the east.

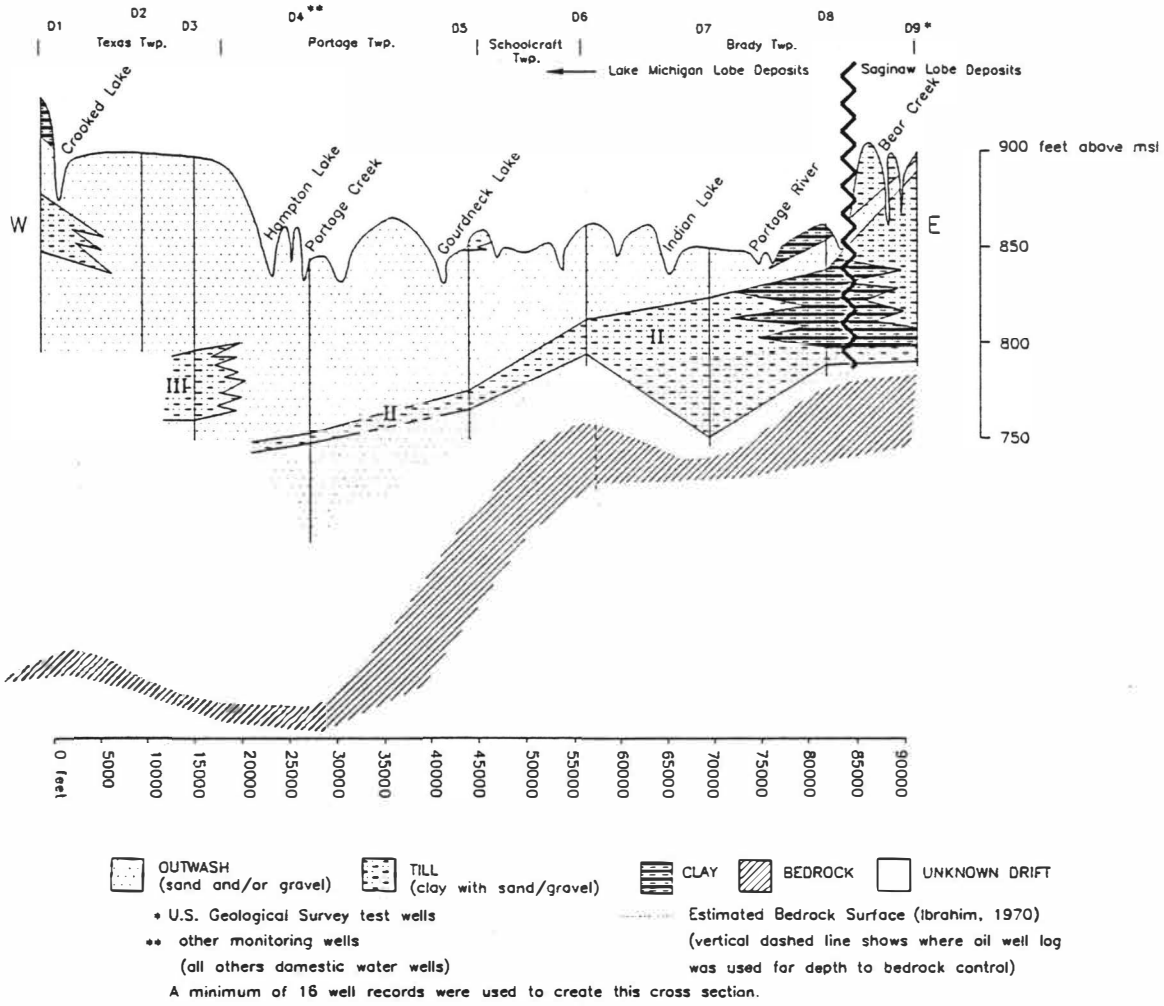


Figure 12. Cross Section D-D'.

Cross Section E-E'

Cross section E-E' transects the study area from east of the Kalamazoo Moraine in Texas Township, into Schoolcraft Township, and ends at the eastern edge of Brady Township on the Wakeshma till plain (Figure 13).

This cross section depicts numerous till layers, some of which do not appear to be laterally extensive. The far western well E1 indicates the presence of three till units. The upper till unit does not extend to the next well to the east. The central till unit extends eastward throughout the section becoming more clay rich to the east. The lower till unit, although of significant thickness (at least 55 feet) does not appear to extend very far to the east, as evidenced by well E3.

A discontinuous till exists at the surface in the eastern portion of the section. Surficial till is also observed in northern Schoolcraft Township.

Bedrock elevations increase to the east; however, the rise in the bedrock surface is more gradual than observed in cross sections to the north.

Cross Section F-F'

Cross section F-F' transects the study area in Kalamazoo County from east of the Kalamazoo Moraine in Prairie Ronde Township through Schoolcraft Township and into Brady Township, ending on the Wakeshma till plain (Figure 14).

This Cross section depicts two major till units. One till unit is encountered at depth in the four westernmost wells. This unit thins to the east and appears to end in eastern Schoolcraft Township where the bedrock surface rises towards the Wakeshma till plain. Another till layer is encountered in the easternmost wells of the section. This till appears to interfinger with outwash to the west and ends where the bedrock

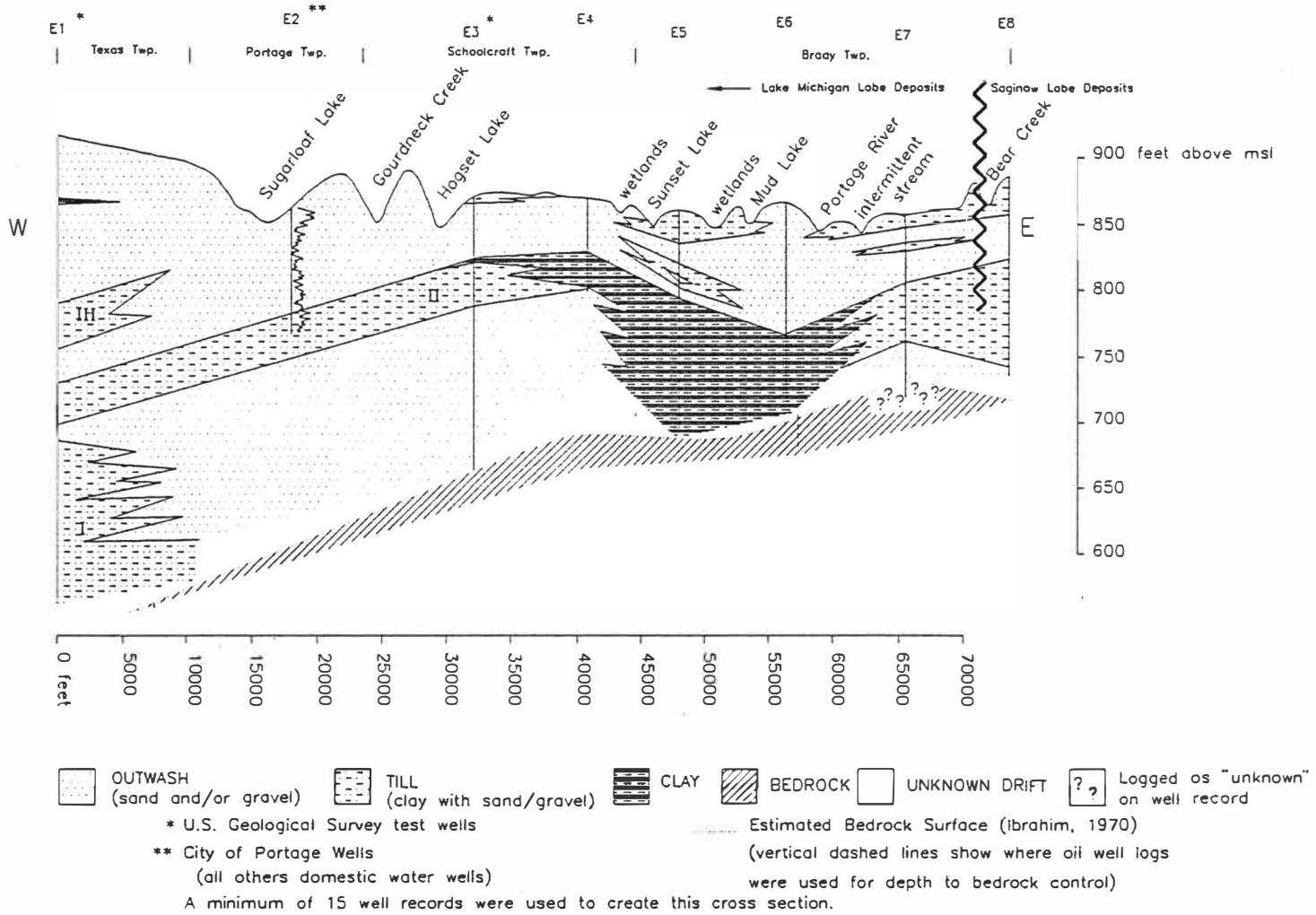


Figure 13. Cross Section E-E'.

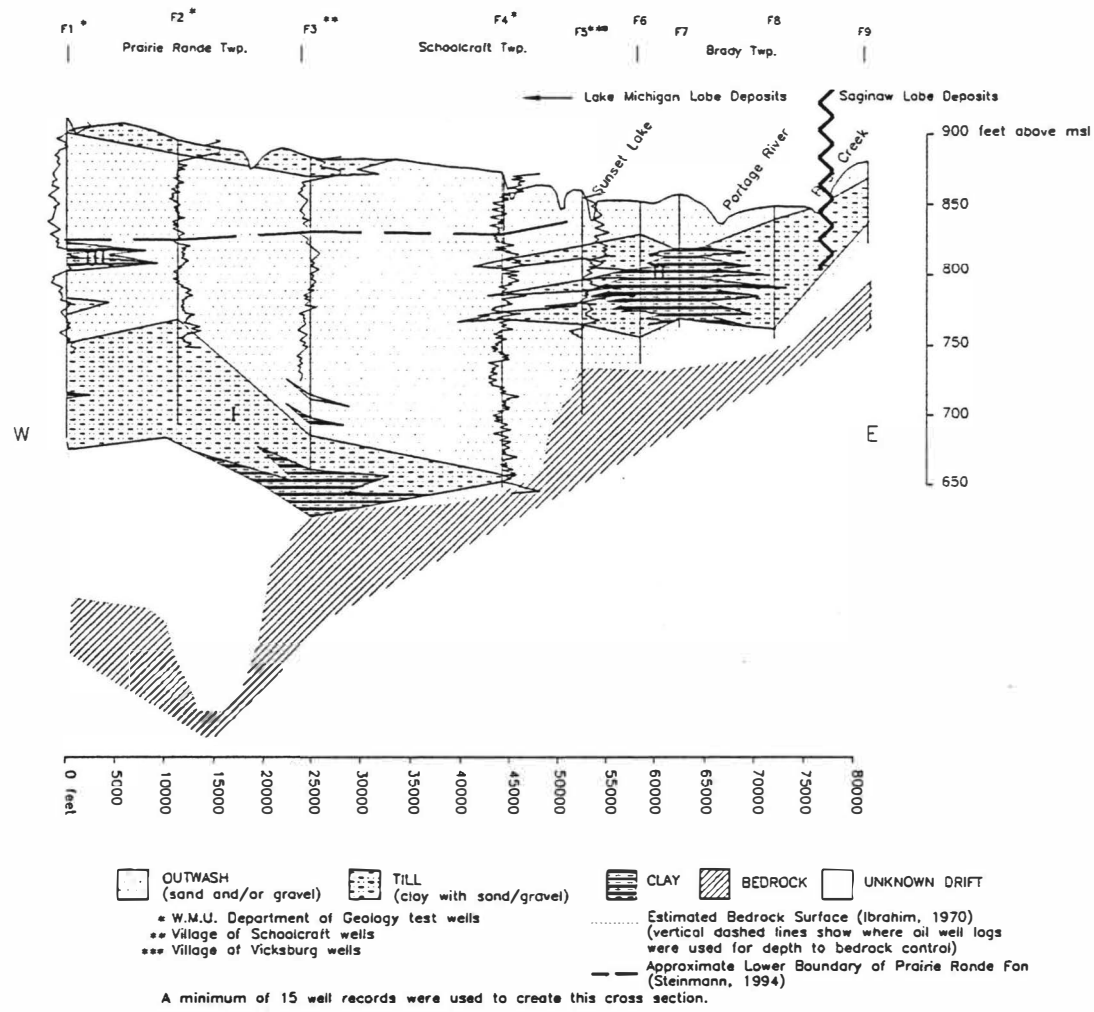


Figure 14. Cross Section F-F'.

topographic surface descends to an apparent valley.

A surface till is encountered in the western portion of the section. This till directly overlies the deposits of the Prairie Ronde Fan. Steinmann (1994) depicts the till as discontinuous over the fan. The outwash beneath the fan contains lenses of clay and till.

Cross Section G-G'

Cross section G-G' transects the study area in Kalamazoo County from west-central Prairie Ronde Township through Schoolcraft Township and into Brady Township, ending on the Wakeshma till plain (Figure 15).

This cross section depicts at least two major till units, one in the eastern portion and one in the western portion of the section. An upper till unit is also present in the two easternmost wells. Based on log descriptions, these till units are more clay-rich than tills occurring in other parts of the study area. A bedrock valley appears to be present in the central portion of the section. Bedrock is directly overlain by till in Prairie Ronde Township.

Almost 200 feet of outwash deposits, including the Prairie Ronde fan and the older outwash beneath it (Steinmann, 1994) are present in the western portion of the section. This thick outwash contains thin, discontinuous clay and till lenses.

Cross Section H-H'

Cross section H-H' transects the study area from the Kalamazoo Moraine in Porter Township, Van Buren County through Prairie Ronde Township and the southwest corner of Schoolcraft Township in Kalamazoo County and into Park and

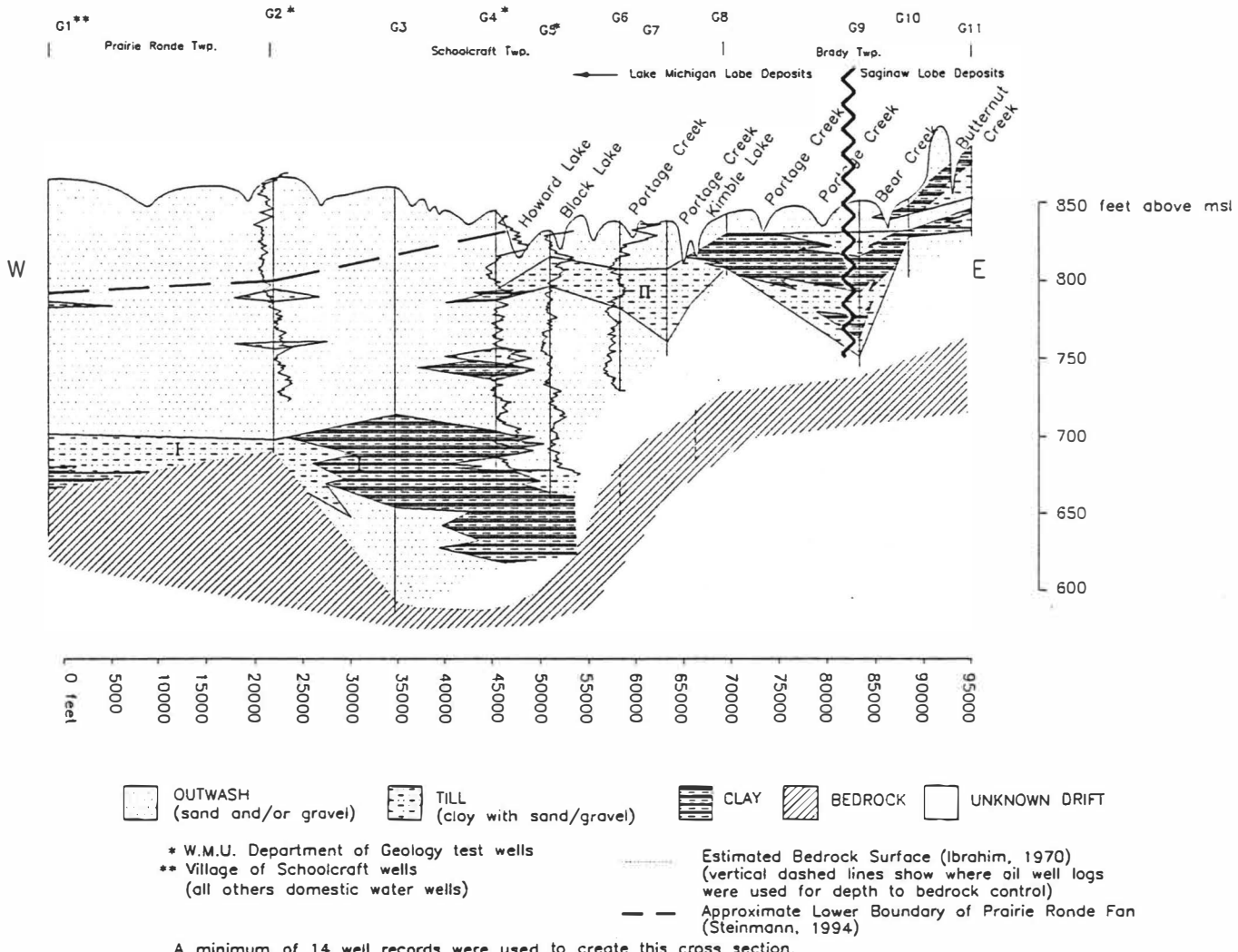


Figure 15. Cross Section G-G'.

Mendon Townships in St. Joseph County (Figure 16).

Because of the very great glacial drift thickness in the western portion of this section, and the lack of deeper wells in this area, much of the deep stratigraphy is unknown. The log from the westernmost well H1, located on the Kalamazoo Moraine, in Van Buren Township, depicts till at the surface. Surface till was also recorded in the wells on and near the area mapped as the Sturgis Moraine.

A till layer is shown in the eastern portion of the section. The till appears to become more clay rich to the east beneath the Wakeshma till plain. The extent of this till layer is unclear due to reasons indicated above.

Based on the bedrock topography map, the bedrock surface descends to the west below the Kalamazoo Moraine. The Sturgis Moraine appears to be situated where bedrock begins to rise in Prairie Ronde Township. The bedrock surface appears to descend again at the eastern edge of the section.

Cross Section I-I'

Cross section I-I', oriented from northeast to southwest transects the study area just east of the Kalamazoo Moraine from Kalamazoo Township through the northwest corner of Portage Township through Texas and Prairie Ronde Townships and ending on the Kalamazoo Moraine in Porter Township of Van Buren County (Figure 17).

Three major till units are depicted in the cross section. All three till units are present throughout the known areas of the section. It is unclear how far south these till units extend due to the lack of deeper wells in the southern portion of the section. The surficial outwash section may contain till lenses as implied by well I3.

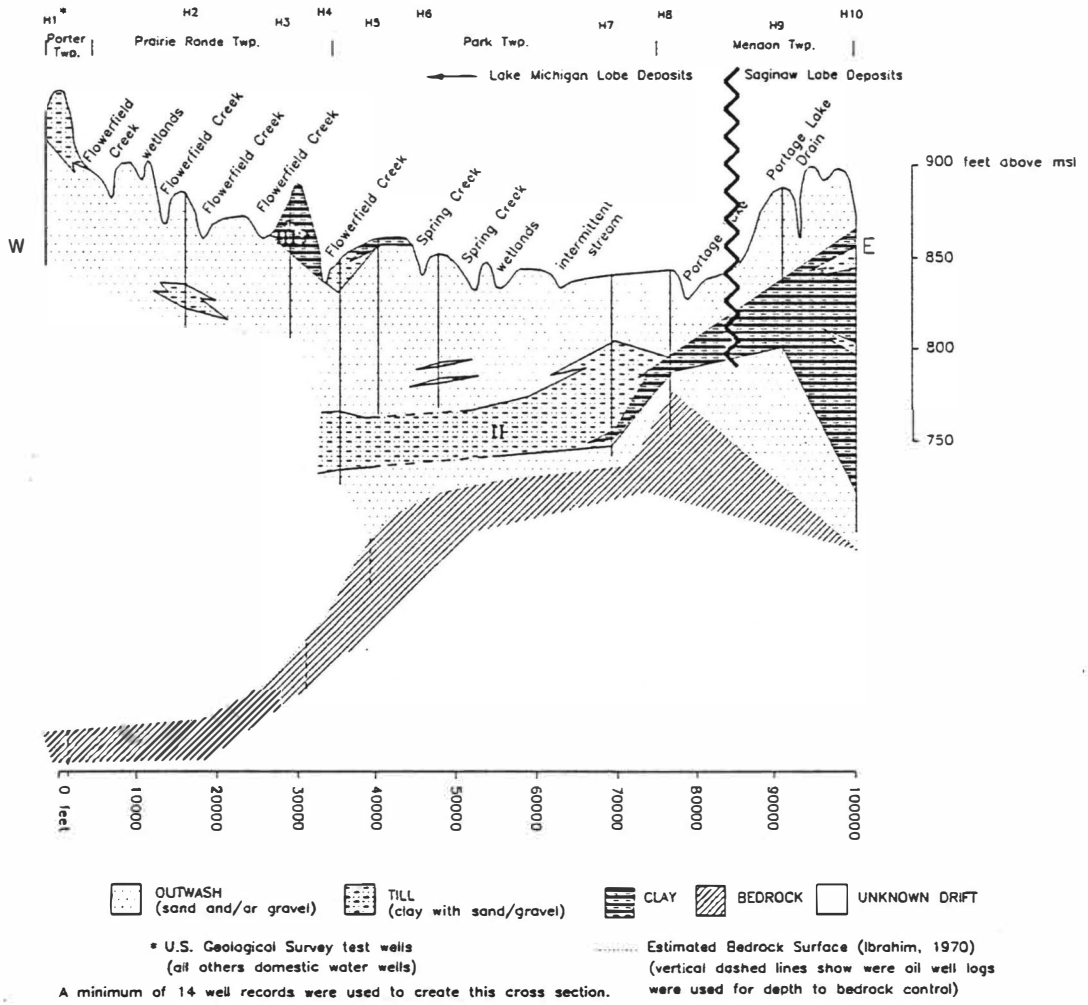


Figure 16. Cross Section H-H'.

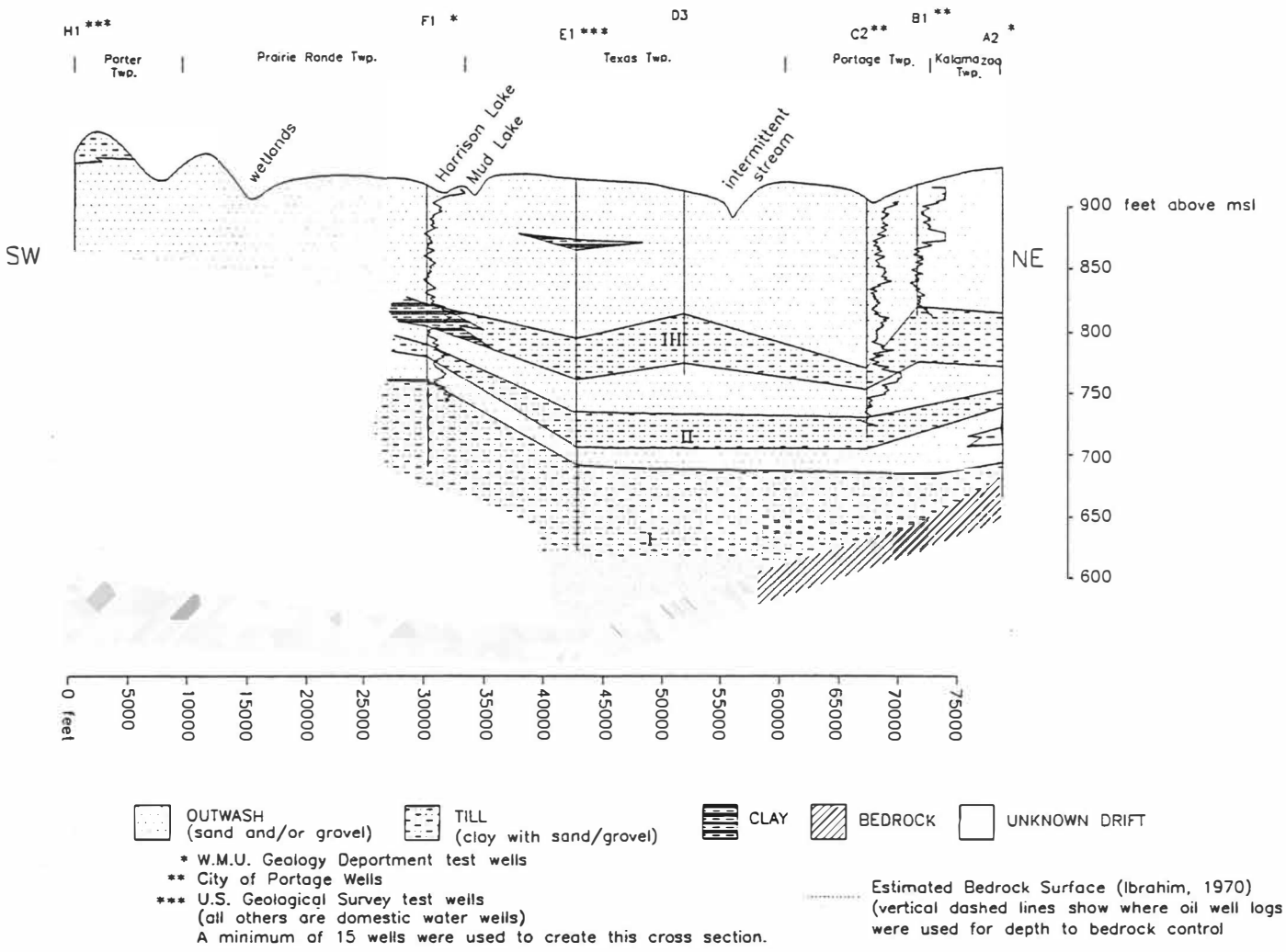


Figure 17. Cross Section I-I'.

Cross Section J-J'

Cross section J-J' transects the west-central part of the intermorainal area with a northeast-southwest orientration from Kalamazoo Township through Portage Township and Schoolcraft Township and ending in southern Prairie Ronde Township (Figure 18).

Four till units are depicted in the northern portion of the cross section. The upper three tills do not extend to the southern portion of the section. Bedrock is directly overlain by till throughout most of the section. The deeper stratigraphy in the southern portion is unclear due to the absence of deeper wells in this area. Surface till is depicted in the southernmost well where the Sturgis Moraine has been mapped.

Cross Section K-K'

Cross section K-K' transects the central part of the intermorainal tract from north to south from the northeast corner of Portage Township through Schoolcraft Township and into Park Township in St. Joseph County (Figure 19).

The northern portion of this section depicts a surface till, a till unit directly overlying bedrock, and two intermediate till layers. Although the surface till appears to dip beneath the surface, it does not appear to extend very far to the south, nor does the till unit beneath it. The third till unit from the surface can be traced to the south where it becomes more interfingered with outwash. It appears that two till units may be encountered beneath this interfingered till in the south, although it is unclear how extensive these units are. Bedrock topography appears to be much more variable in this section than in other north-south cross sections.

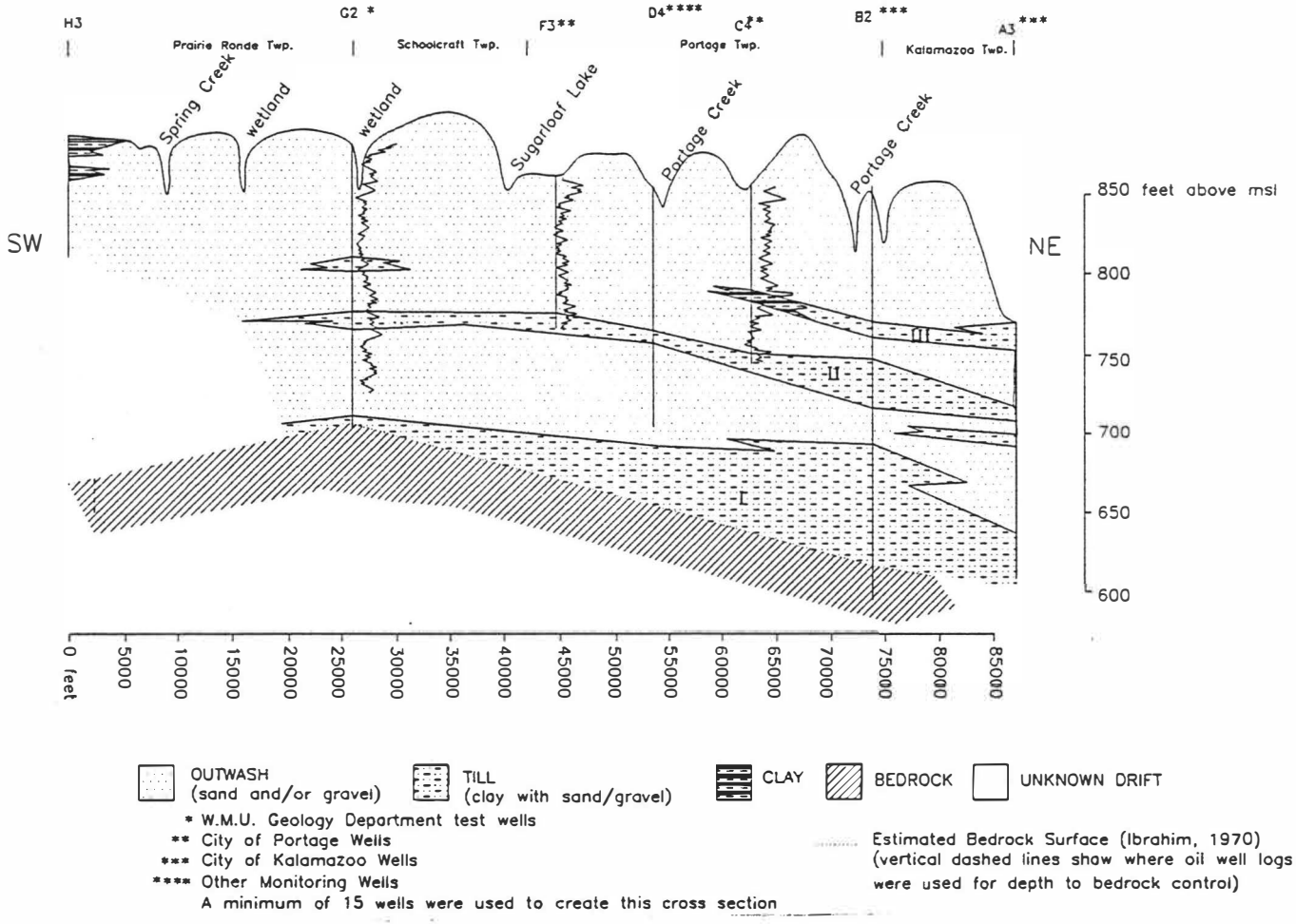


Figure 18. Cross Section J-J'.

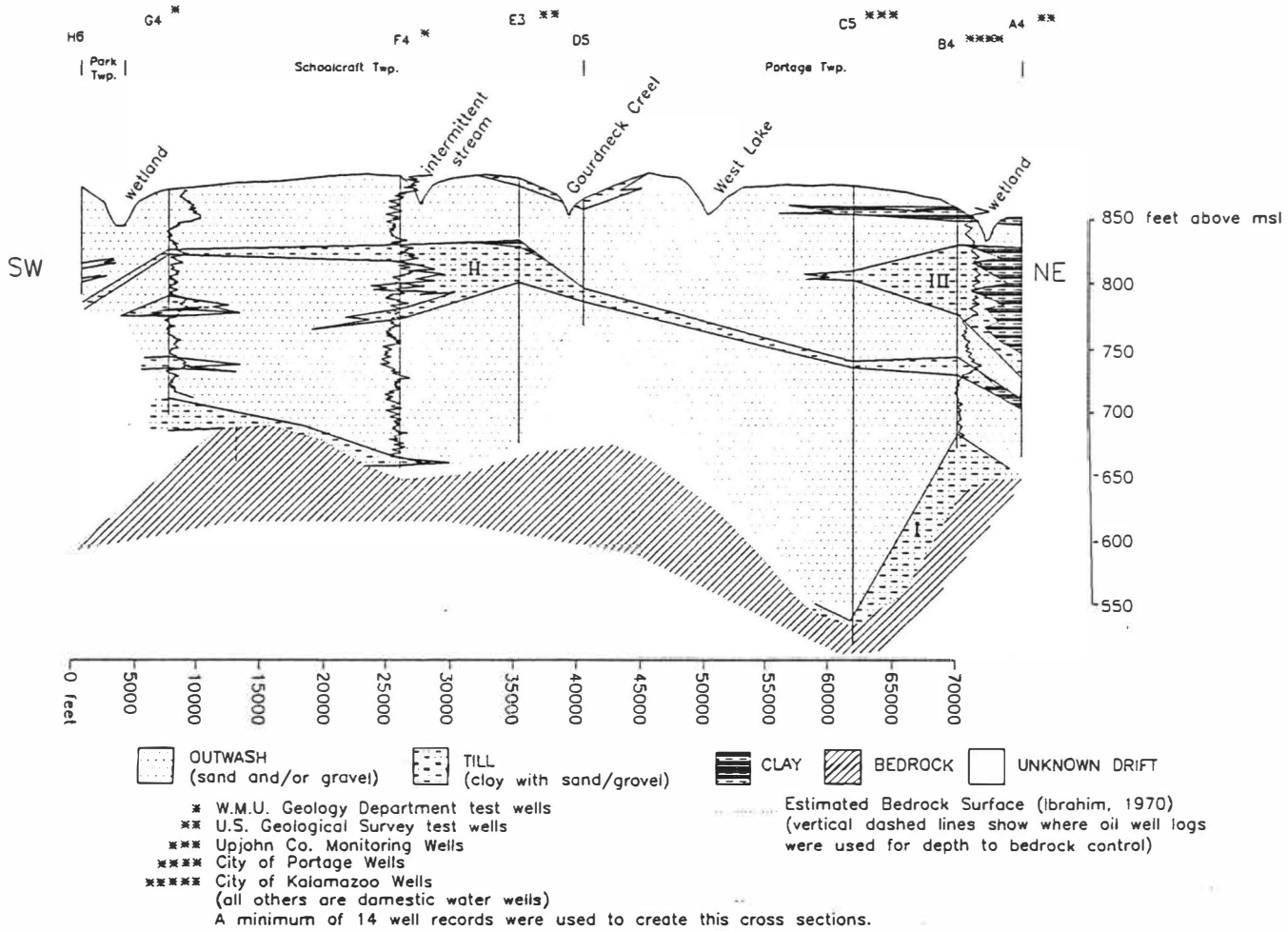


Figure 19. Cross Section K-K'.

Cross Section L-L'

Cross section L-L' transects the eastern margin of the intermorainal area from the outwash fan complex east of the Tekonsha Moraine in Climax Township, across the moraine itself in Pavilion Township through Brady Township and ends in Schoolcraft Township (Figure 20).

A major subsurface till unit extends throughout the entire length of this section. Surface till is observed at the central to northern portion of the section. As evidenced by the bedrock topography map, a bedrock high also appears to be present in this area. The position of the major till unit throughout the section appears to mimic bedrock topography.

Summary

The stratigraphic analysis performed in this study has identified and correlated three major till units and numerous minor till units (Figure 21). For the purposes of discussion, the three major till units will be classified as till units T-I, T-II (Figure 22), and T-III (Figure 23).

Till unit T-I is the layer found directly overlying bedrock in the west-east cross sections A-A', B-B', C-C', and G-G'. It may also be present in west-east cross sections E-E' and F-F' although it does not appear to directly overlie bedrock in these sections. Till unit T-I underlies a fourth till unit observed in cross section A-A' that is known to contain organic and weathered material. This weathered and organic material most likely is a soil horizon which may represent a long interstadial period. Passero (1981) suggests that this may be the Sangamon Paleosol which was formed in the interstadial period between the Wisconsinan and Illinoian glaciations. If this is true, then till unit

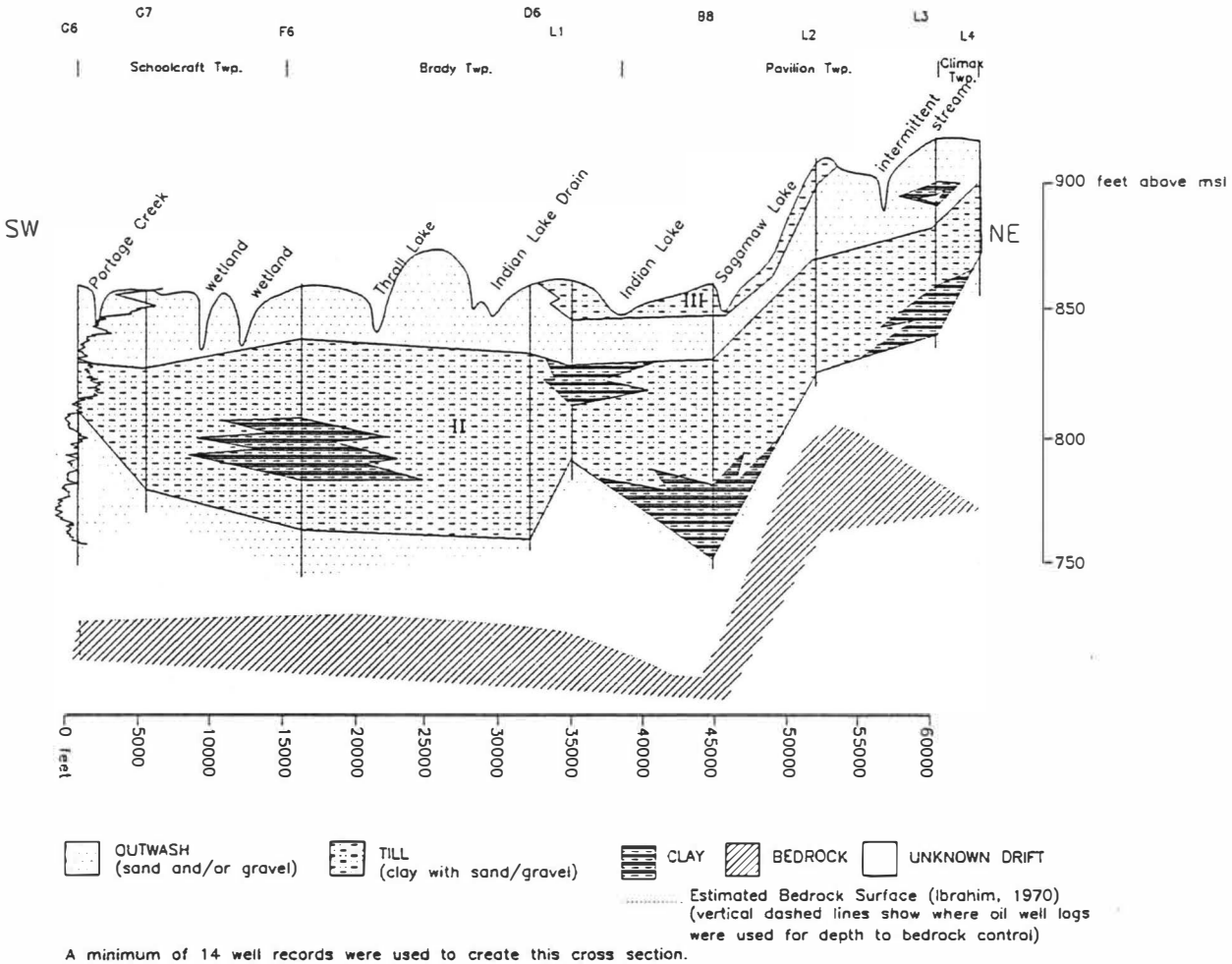


Figure 20. Cross Section L-L'.

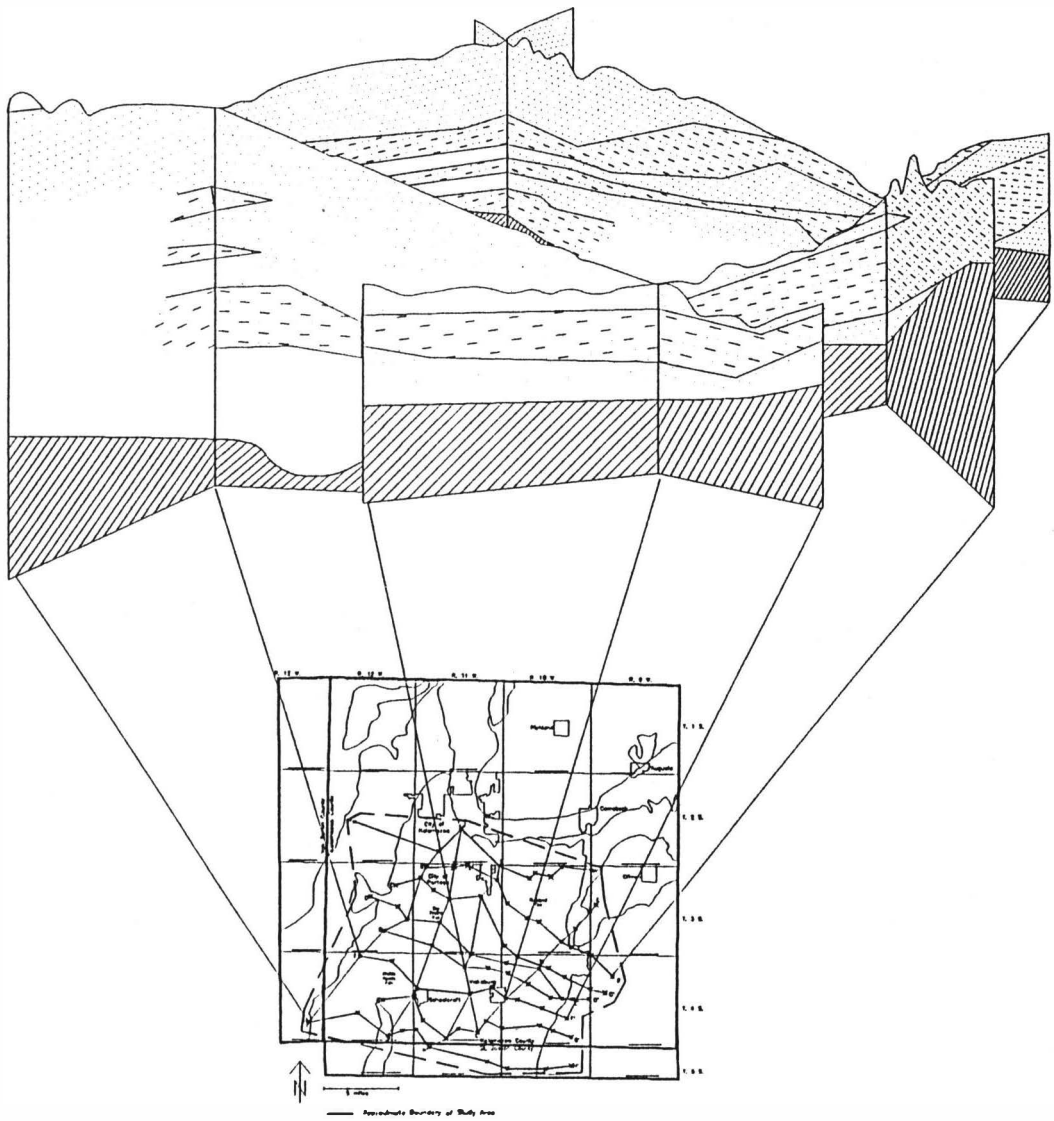


Figure 21. Fence Diagram.

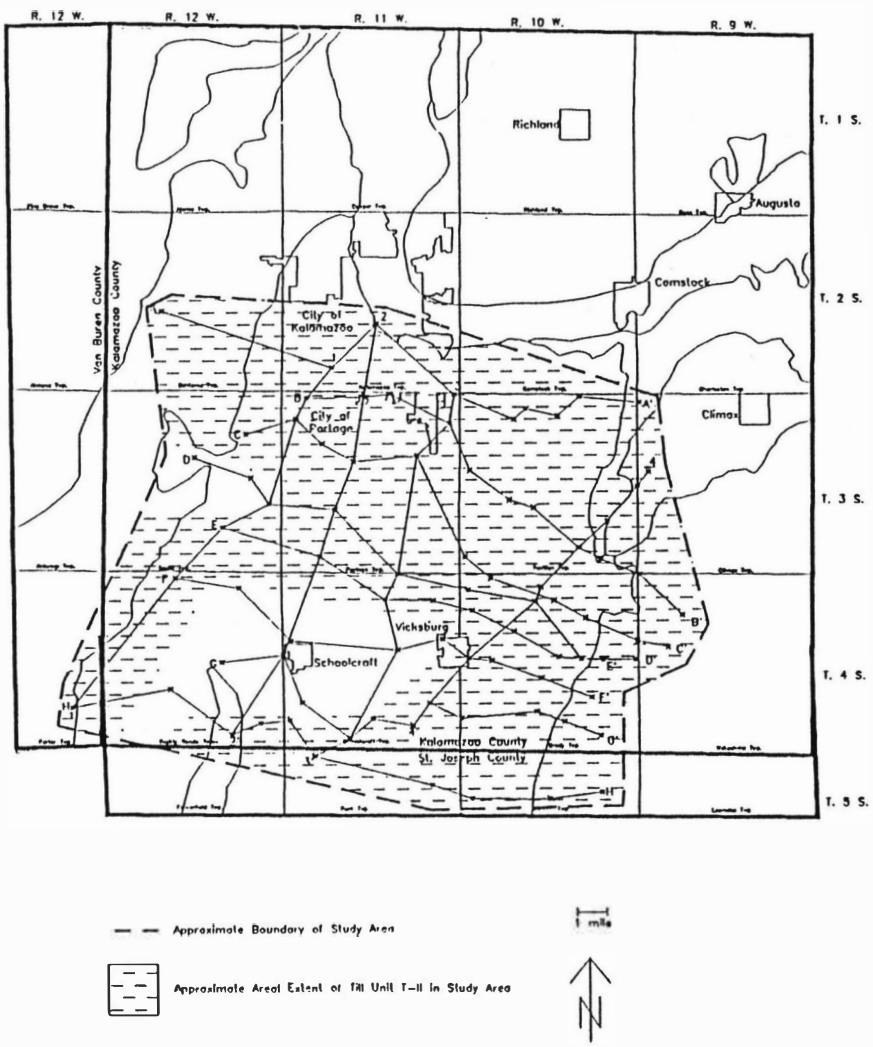


Figure 22. Map of Areal Extent of Till Unit II.

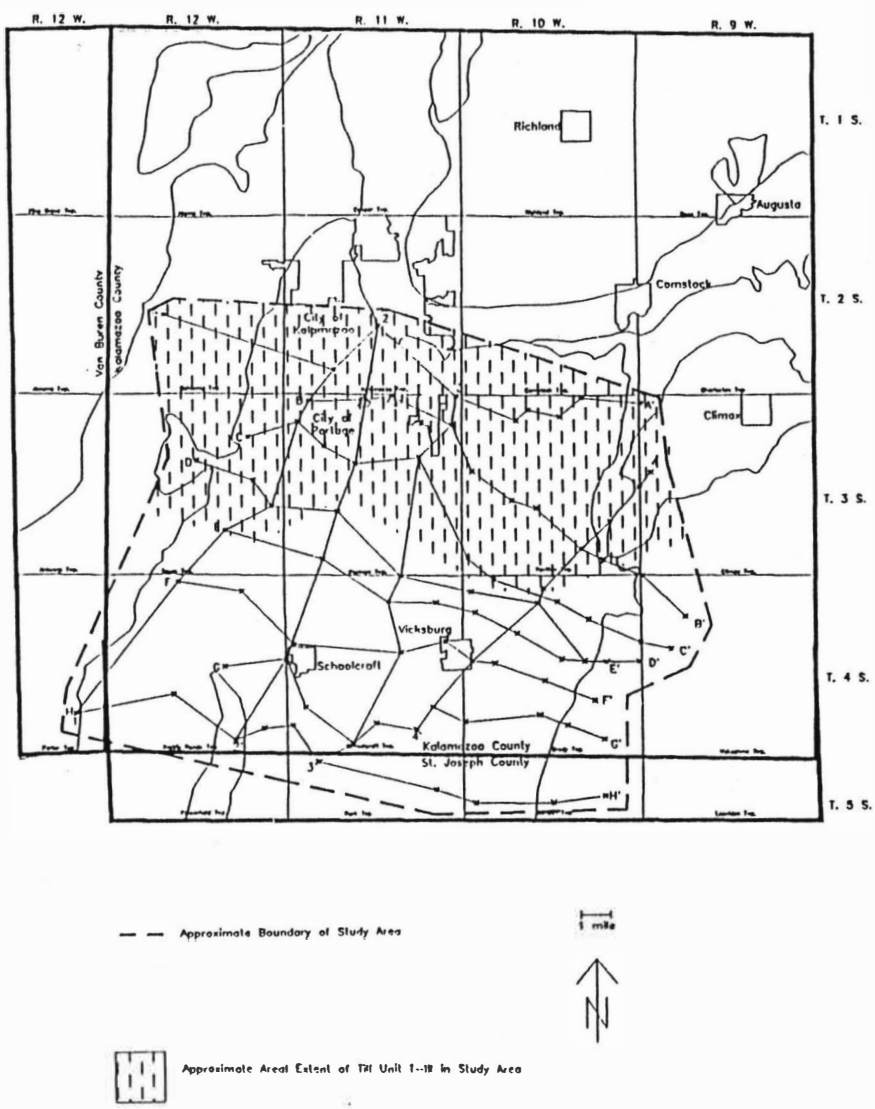


Figure 23. Map of Areal Extent of Till Unit III.

T-I was deposited by pre-Wisconsinan ice. Due to unknown areas at depth in the cross sections, this till unit could not be accurately mapped over the entire study area.

Till Unit T-II is the extensive layer found in every cross section, although it is most apparent in the eastern portion of the study area and is the major till unit depicted on cross section L-L'. Till unit T-II appears to be present at the surface in Pavilion and northwestern Brady Townships as shown in cross sections B-B' and C-C'. This till unit is discontinuous in the southwestern portion of the study area. Lenses of till in the massive outwash units in this area may represent remnants of till unit T-II.

Till Unit T-III is depicted on west-east cross sections A-A', B-B', C-C', and D-D', and may be present in the far western wells of cross sections E-E' and F-F'. This till unit appears to be present only in the northern half of the study area. It appears at the surface in the western portions of cross sections A-A', B-B', and C-C' in wells located mainly in Pavilion Township.

All east-west cross sections indicate that the Wakeshma till plain is located on a bedrock topographic high. A till unit that may not be associated with till unit T-II is present at the surface of the till plain as shown in cross sections D-D' and E-E'. Apart from local variation, bedrock topography appears to decrease in elevation west of the Wakeshma till plain to the Kalamazoo moraine.

Cross sections A-A', B-B', C-C', and D-D' transect the northern portion of the study area where surface topographic relief appears to be much more variable. This northern region is also the area characterized by two continuous till units, T-II and T-III, across the sections.

CHAPTER V

CONCLUSIONS

Assuming that the thick till unit encountered in the westernmost well of cross section A-A' contains the Sangamon paleosol, then till unit T-I, which is encountered beneath this thick till layer, must be pre-Wisconsinan. The overlying thick till layer is encountered in the outwash between till unit T-I and till unit T-II. This outwash then would represent the transition from pre-Wisconsinan to Wisconsinan. The initial movement of the Saginaw ice through most of the study area does not appear to be represented by any major till units. Given that the Saginaw Ice was assumed to be very thin in this region, it is likely that any basal till would have been obliterated by subsequent ice movement and meltwater. However, the clay rich areas of till unit T-II depicted on the eastern portion of many of the cross sections may represent movement of the Saginaw Lobe over the Wakeshma till plain given the boundary of the extent of advance of the Lake Michigan Lobe over the area as proposed below.

The majority of till unit T-II represents the movement of the Lake Michigan Lobe over the study area to the position of the north-south trending arm of the Tekonsha Moraine. The position of the Tekonsha Moraine appears to be controlled by bedrock topography. Where the Tekonsha Moraine is present at the surface, it appears that the ice lobe encroached upon the bedrock topographic high, as depicted on cross sections A-A' and B-B'. To the south, it appears that the Lake Michigan Lobe abutted against the bedrock escarpment, apparent in the cross sections, during deposition of the Tekonsha Moraine. More specifically, the ice of the Lake Michigan Lobe probably abutted against the ice of the Saginaw Lobe, which was still standing

on this topographically higher area. In the area where the Tekonsha Moraine adjoins the escarpment, it was subsequently buried by outwash and ensuing till deposition.

An areal trace of the location of the buried moraine was made by tracing a line from the surficial appearance of the moraine through the cross section lines where till unit T-II appears to thicken in cross sections C-C', D-D', and E-E' (Figure 24). In cross sections F-F' and G-G', till unit T-II is not present in the western portions of the sections. The trace of the buried moraine was then made through the section lines where the till unit appears to the east. The trace of the buried moraine was extended through cross section line H-H' at the location where the till unit T-II dramatically becomes more clay rich. Because the north-south trending arm of the Tekonsha Moraine is an end moraine delineating the farthest advance of the Lake Michigan Lobe, the interlobate boundary can be roughly depicted by the trace of the moraine through the study area.

As the lobe retreated, blocks of ice broke from the retreating lobe, and being insulated by glacial debris, melted very slowly. Consequently, as the blocks slowly melted, they were covered by outwash from meltwaters, and when completely melted, formed surficial depressions represented by the present-day lakes (Straw, 1991). By correlating the trace of the moraine with the surficial topography and features, note that the trace of the moraine follows a chain of lakes from the end of the surface moraine down through Kalamazoo County (Figure 25).

The absence of till unit T-II in the southwest portion of the study area may signify rapid advancement and retreat through this area. It may also indicate the presence of powerful meltwater erosional events through the area. It is also likely that the absence of till is actually a combination of these two mechanisms.

The rather thick unit of outwash overlying till unit T-II gives evidence that the

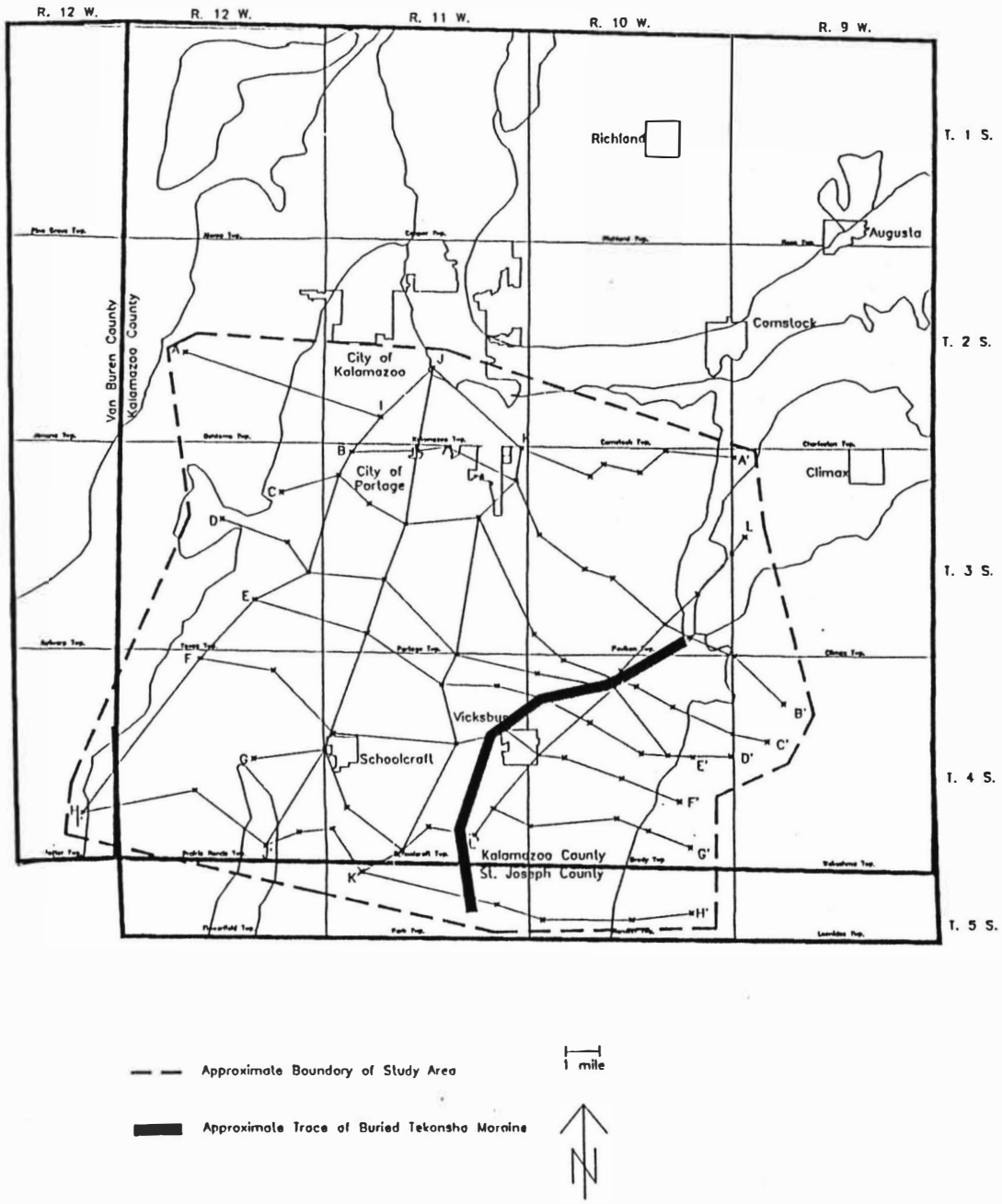


Figure 24. Trace of Buried Arm of the Tekonsha Moraine.

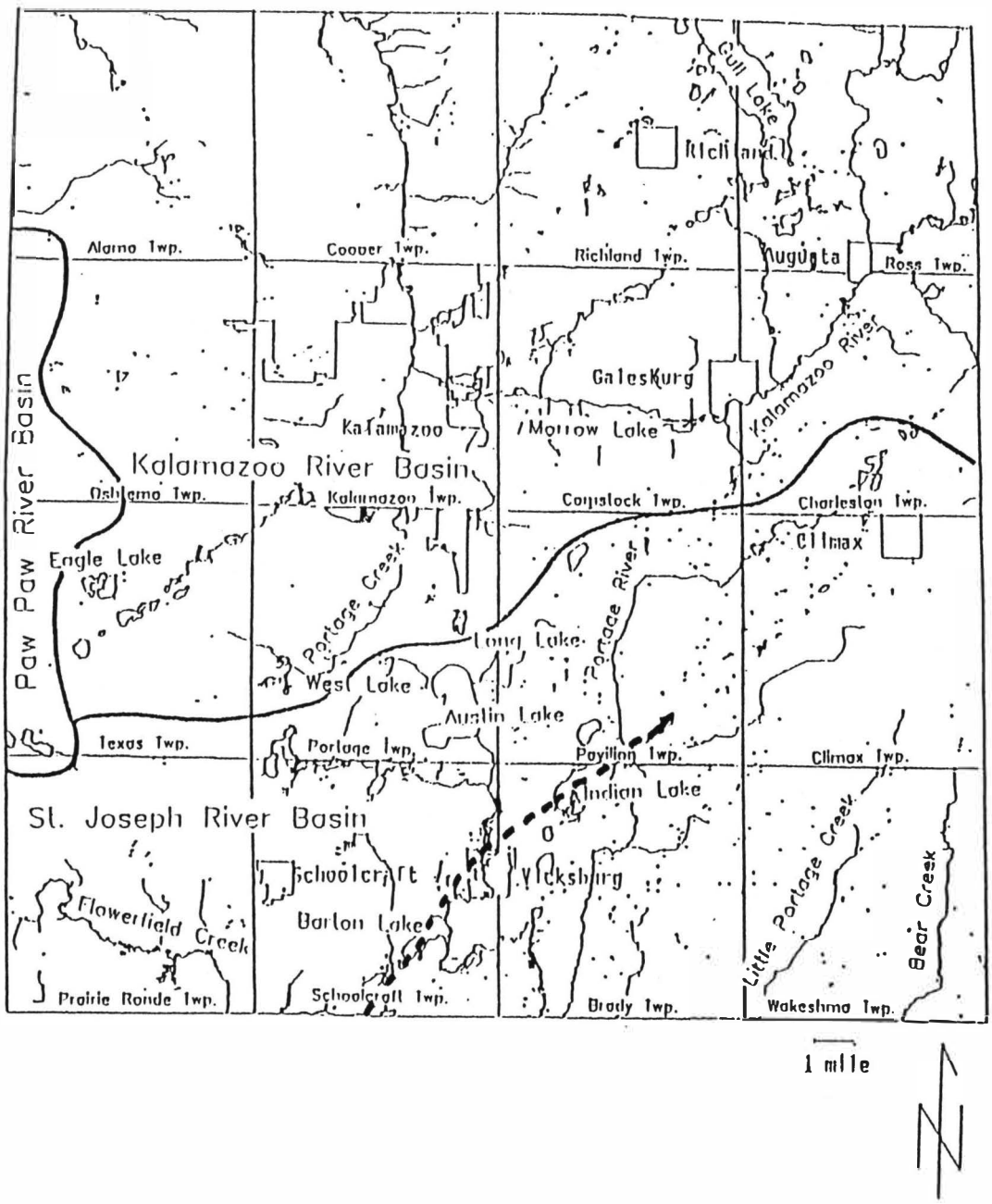


Figure 25. Trace of Buried Arm of the Tekonsha Moraine Superimposed on Map of Surface Water Bodies.

Lake Michigan Lobe retreated from the study area after formation of the Tekonsha Moraine before readvancing to deposit the sediments comprising till unit T-III. As is apparent in cross sections A-A', B-B', and C-C', the Lake Michigan Lobe readvanced to the position of the Tekonsha Moraine in the northern portion of the study area. Another chain of lakes, parallel to the chain tracing the buried Tekonsha Moraine may represent fast retreat of the second readvancement of the ice lobe from the Tekonsha Moraine to this lake chain. At these chains, the rate of retreat may have decreased. This slow retreat coupled with very active ice have resulted in the the complex surficial features, such as kames, and the irregular topography in Portage and Kalamazoo Townships.

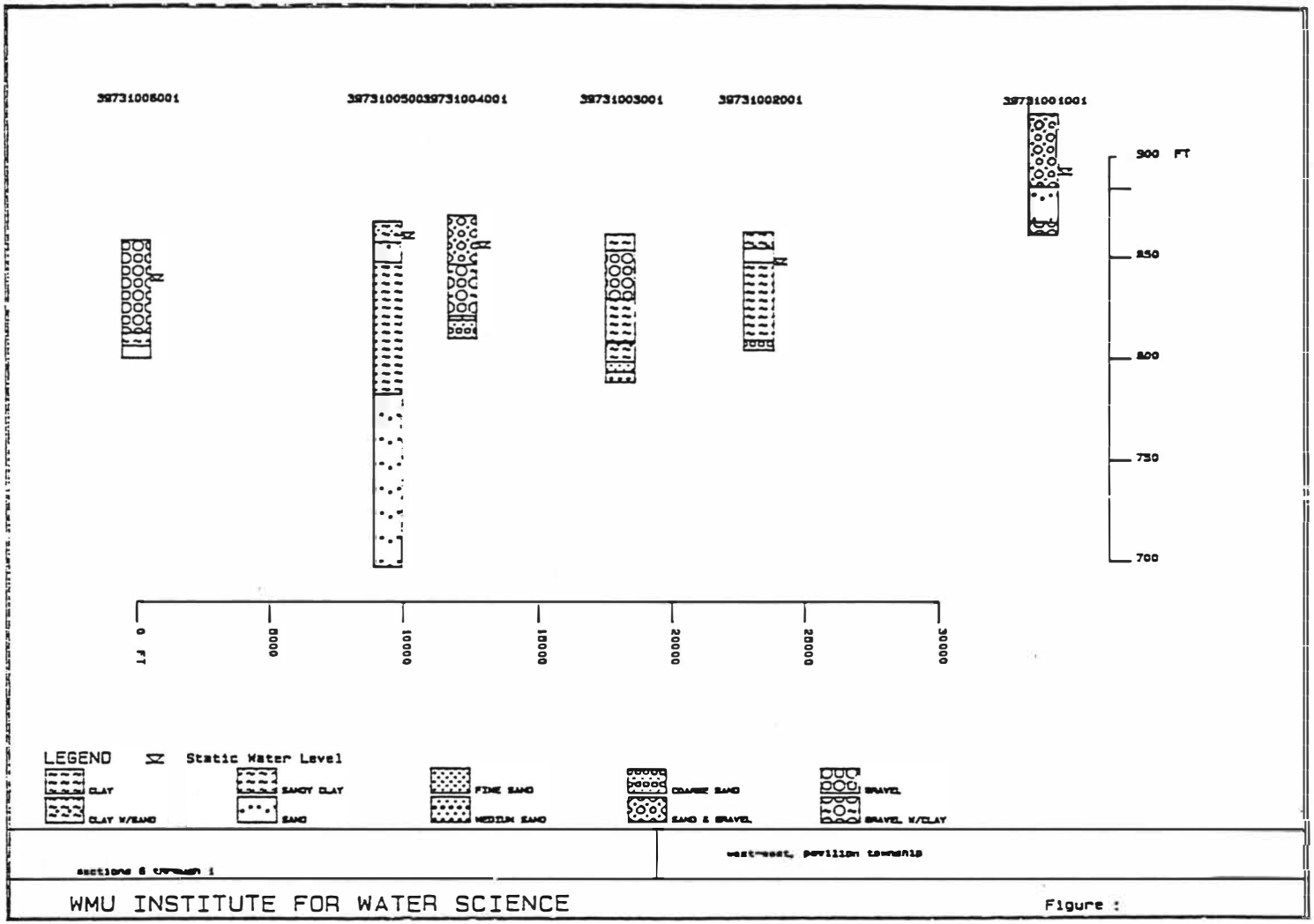
Very little evidence of till unit T-III remains in the southern portion of the study area. Cross section J-J' depicts a lens that appears to be correlatable to till unit T-III, and cross section I-I' suggests the continuation of this unit through the area. Again, rapid movement of the ice and subsequent erosional meltwater action may have obliterated most of the unit in the area. Following the trace of the lake chain southward, the topographic feature previously mapped as the Sturgis Moraine is encountered. This may be an end moraine resulting from the second readvancement of the Lake Michigan Lobe. Note that this feature corresponds to a bedrock escarpment in cross section H-H'. Between this push moraine and the bolder Kalamazoo Moraine, surficial topography is irregular much like Portage and Kalamazoo Townships. Again, this may have been the result of a highly active retreating ice front, in which case, it is possible that the Sturgis Moraine actually represents a "push moraine" resulting from the very active second readvancement of the Lake Michigan Lobe. Therefore, it would be appropriate to rename this feature as the Flowerfield Moraine to distinguish it from the Sturgis Morainal system in St. Joseph County.

Cross sections D-D', E-E', and G-G' depict an upper till unit in the very eastern portion of the study area. This upper till unit represents a readvancement of the Saginaw Lobe after a retreat to at least the position of the west-east trending arm of the Tekonsha Moraine. This readvancement may be equivalent to the readvancement of the Lake Michigan Lobe through the study area.

The surficial outwash complex at the surface of the study area is comprised of at least three glaciofluvial outwash fans (Straw, 1991). Two of these fans, located along the eastern margin of the Kalamazoo Moraine with axis trending generally northwest-southeast were deposited from meltwaters of the Lake Michigan Lobe as the ice stood at the Kalamazoo Moraine. The southernmost of these two fans is younger and may have resulted from a single breakthrough of meltwater (Steinmann, 1994). Surficial till depicted on the western portions of cross sections B-B' and F-F' are likely flow till features resulting from a very active ice margin as the ice deposited the sediments comprising the Kalamazoo Moraine. The fan encountered along the eastern margin of the outwash complex trends north-south, is the youngest fan, and may have been formed by meltwaters from the Saginaw Lobe as it stood at its respective position of the Kalamazoo Moraine in Barry County. The last glacial-related event in the study area was the erosional activities caused by catastrophic drainage of meltwater northeast of Kalamazoo County to form the present day Kalamazoo River Valley.

Appendix A

Short Cross Sections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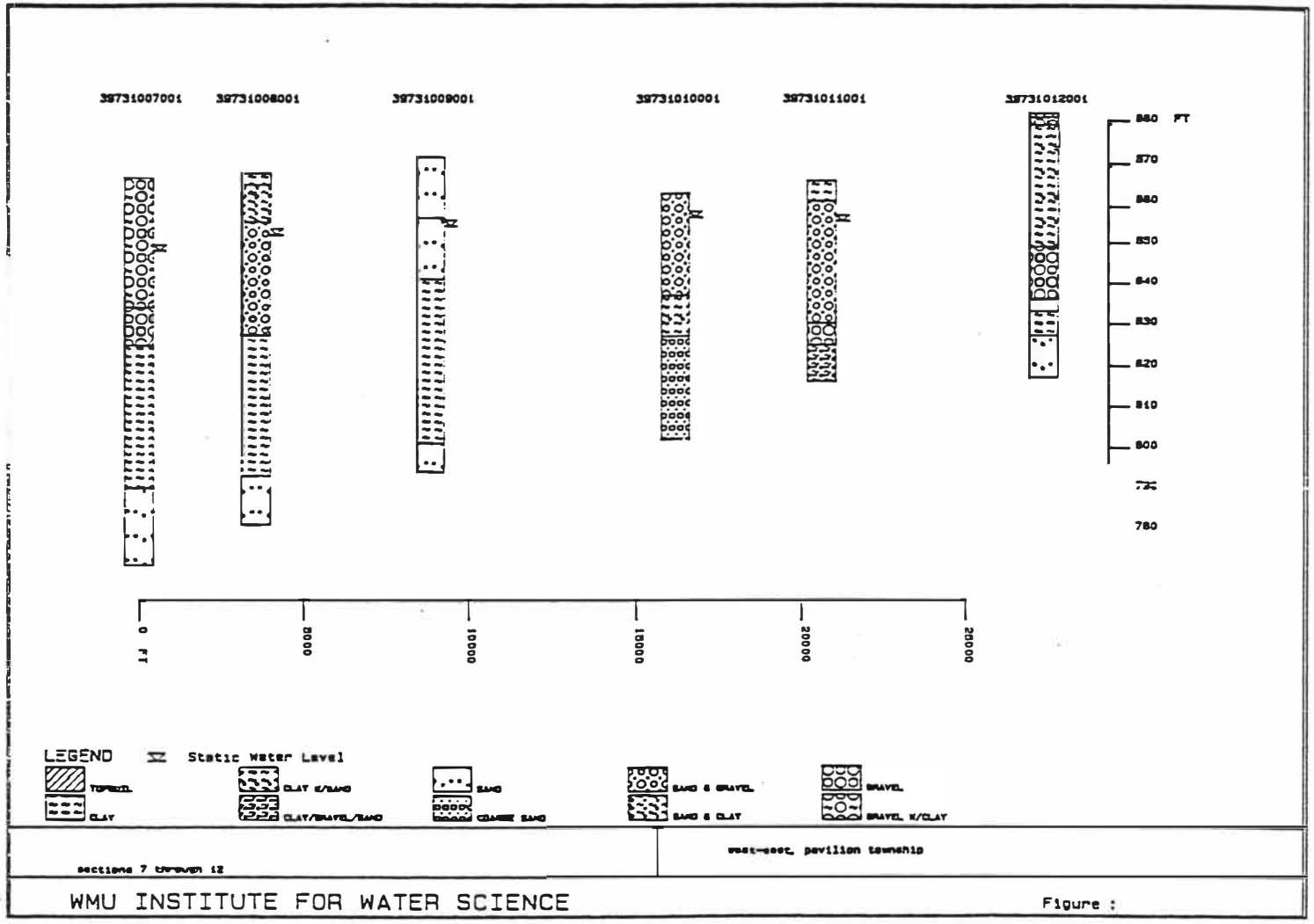
west-east, pavilion townsite
WMU INSTITUTE FOR WATER SCIENCE
Figure :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Static Water Level
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CLAY & SAND
CLAY/GRAVEL/SAND
SAND
COARSE SAND
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SAND & CLAY
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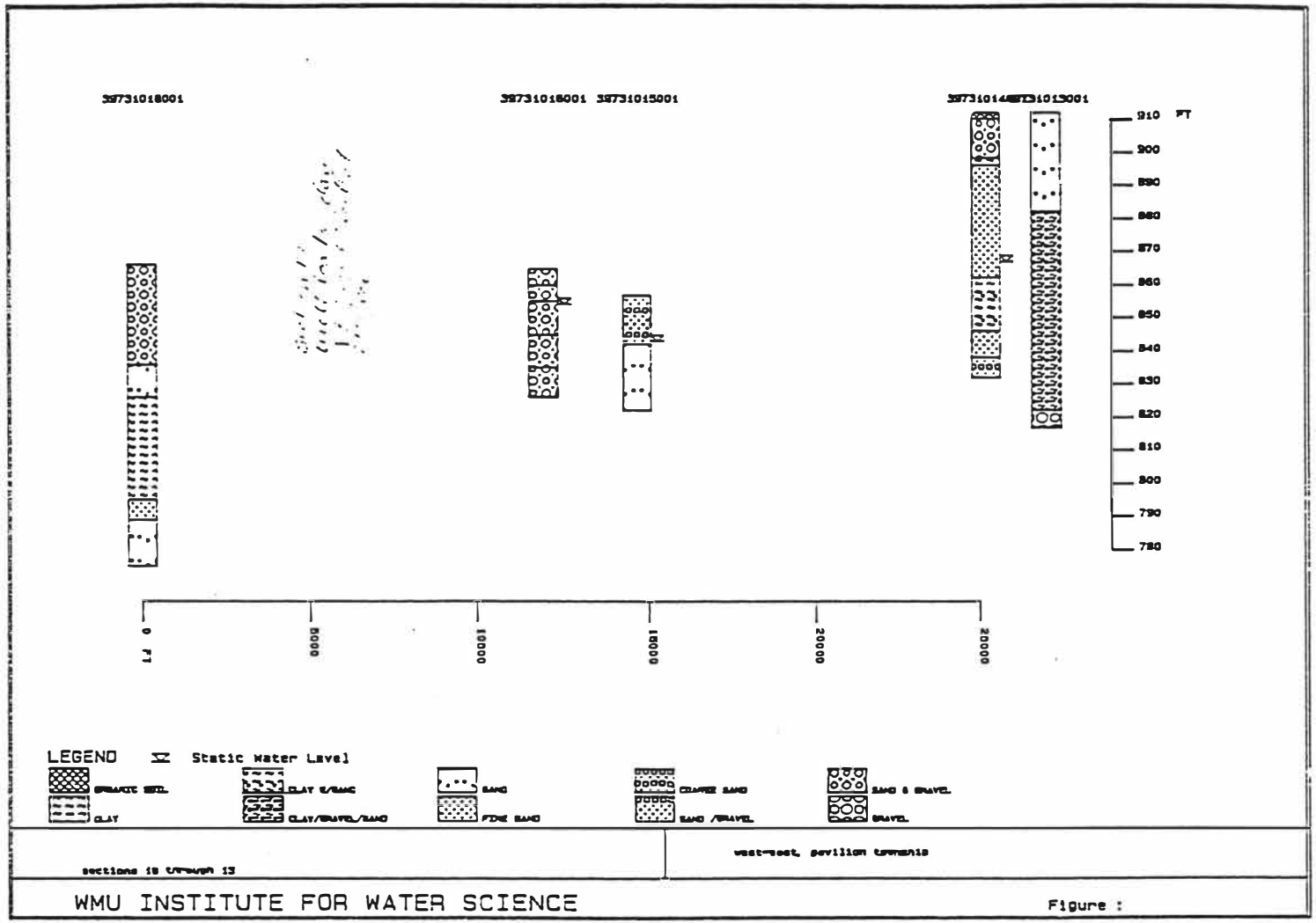
GRAVEL & CLAY
sections 7 through 12
west-east, pavilion township
WMU INSTITUTE FOR WATER SCIENCE
Figure :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LEGEND
Static Water Level
CLAY
CLAY & SAND
CLAY/GRAVEL/SAND
SAND
FINE SAND
COARSE SAND
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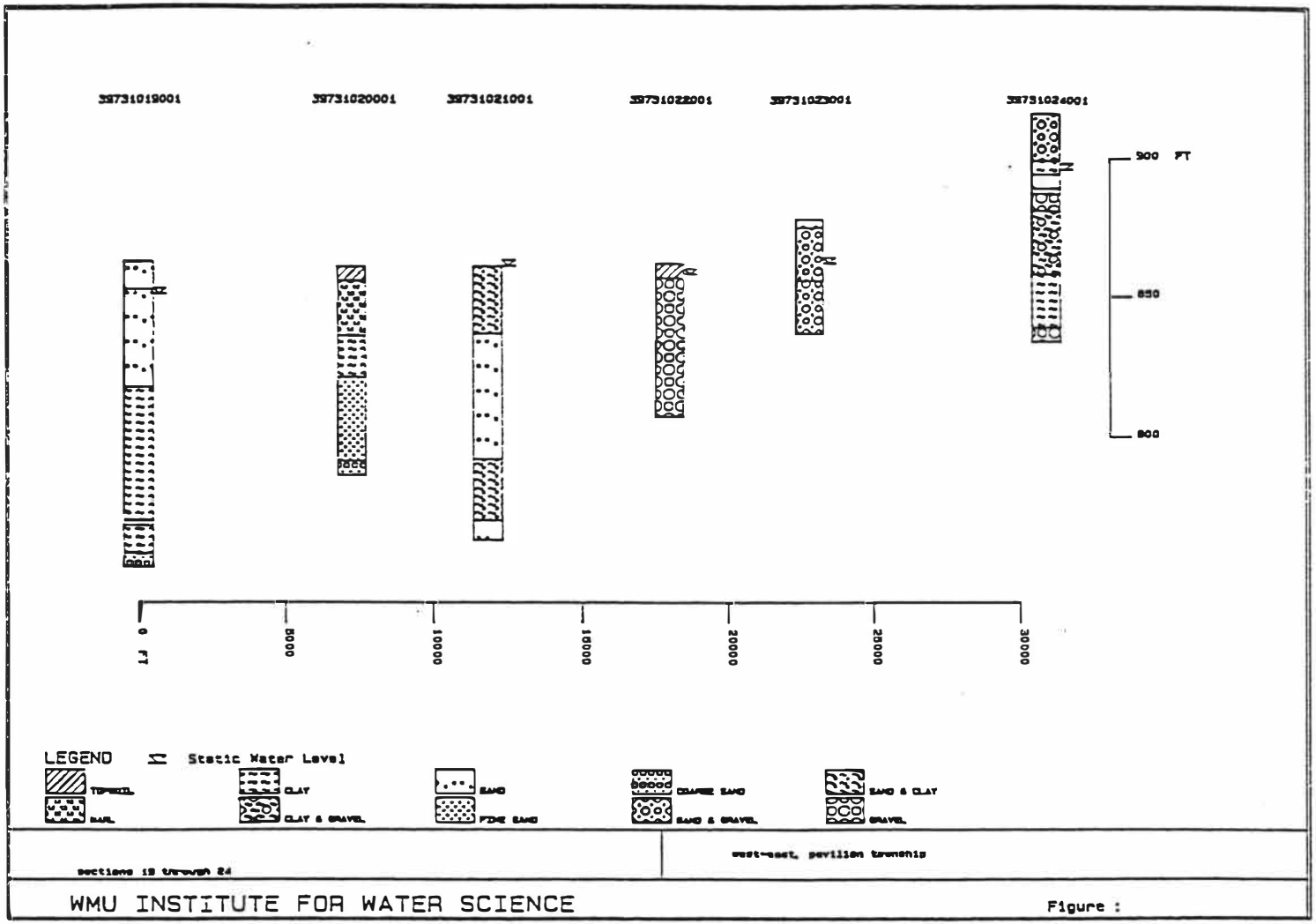
sections 18 through 13
west-east, pavilion township
WMU INSTITUTE FOR WATER SCIENCE
Figure :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30000
LEGEND
Static Water Level
TOPSOIL
MARL
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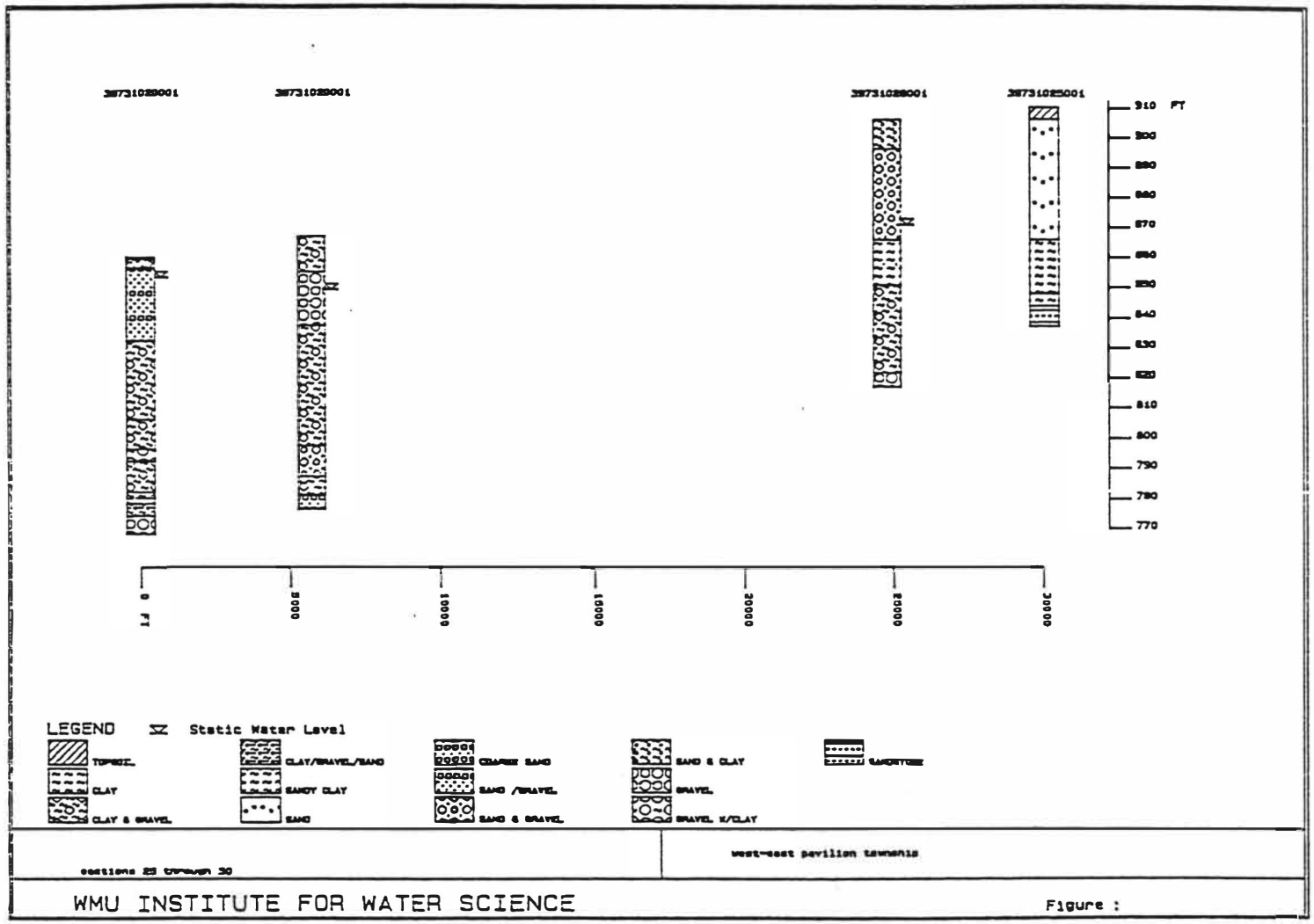
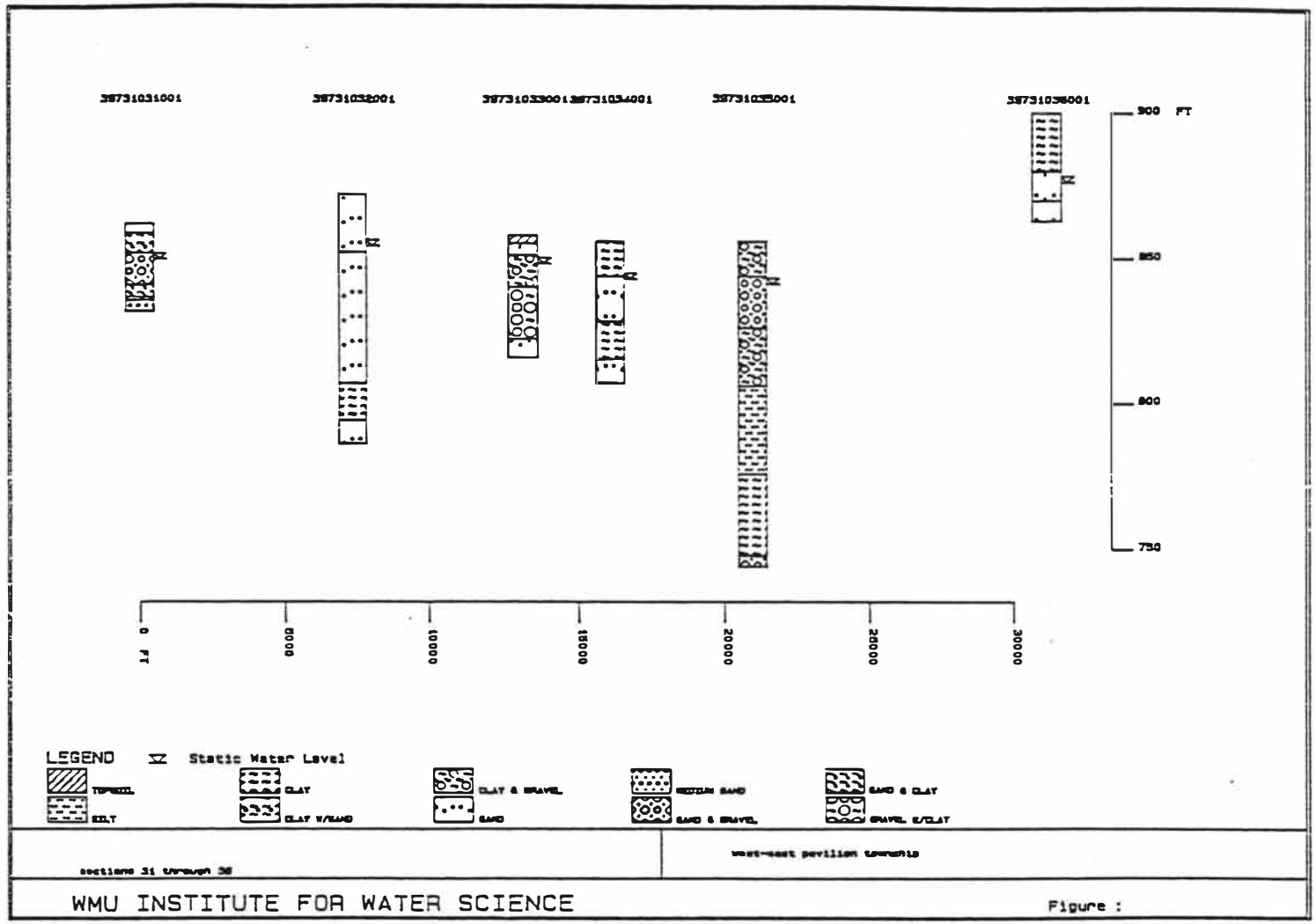
CLAY & GRAVEL
SAND
FINE SAND
COARSE SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
sections 19 through 24
west-east, pavilion township
WMU INSTITUTE FOR WATER SCIENCE
Figure :


910 FT
900
890
880
870
860
850
840
830
820
810
800
790
780
770
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
TOPSOIL
CLAY
CLAY & GRAVEL
CLAY/GRAVEL/SAND
SANDY CLAY
SAND
COARSE SAND
SAND /GRAVEL
SAND & GRAVEL
SAND & CLAY
GRAVEL
GRAVEL W/CLAY
SANDSTONE
sections 25 through 30
west-east pavilion townsite
WMU INSTITUTE FOR WATER SCIENCE
Figure :



sections 31 through 36

west-east pavilion township

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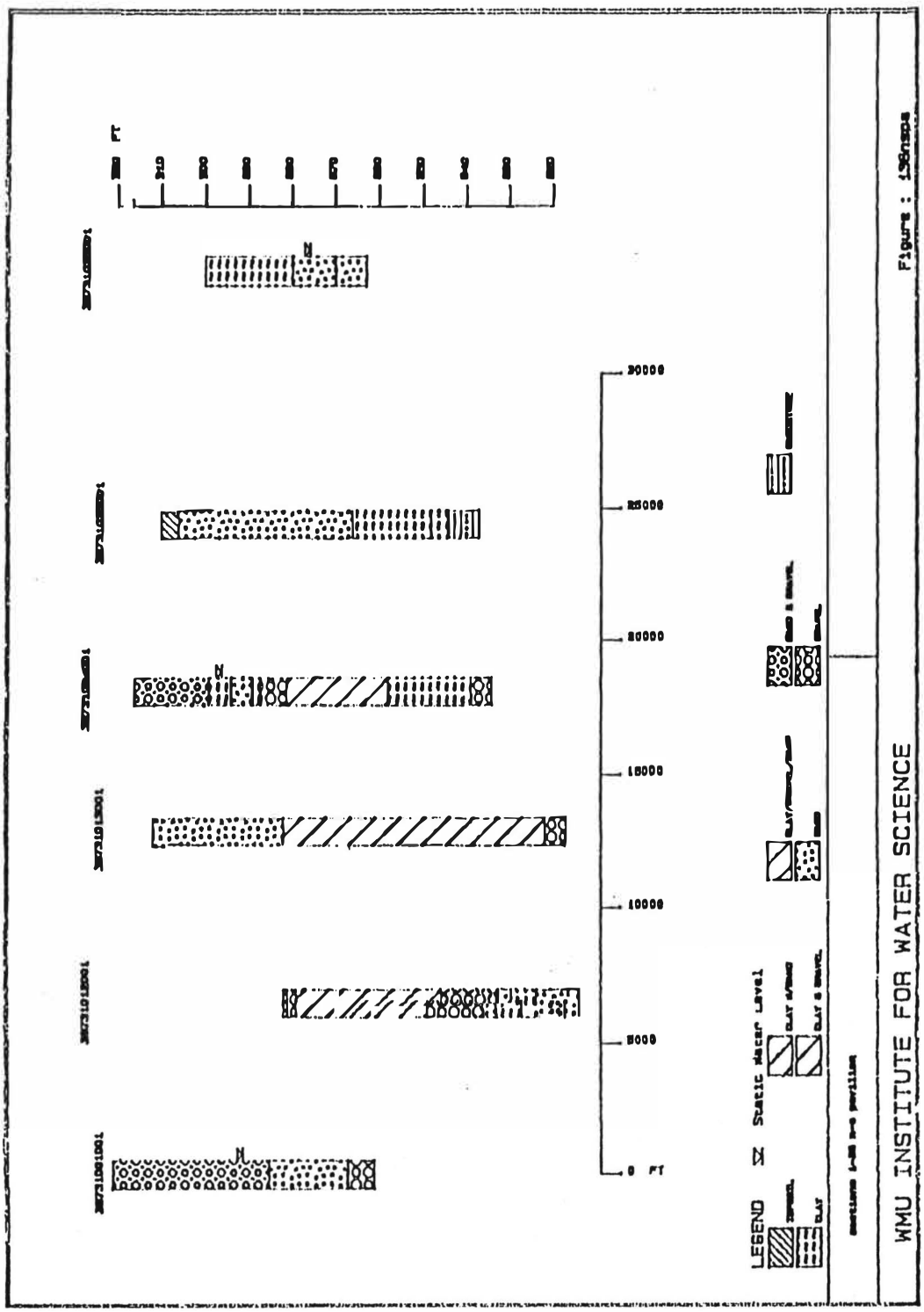
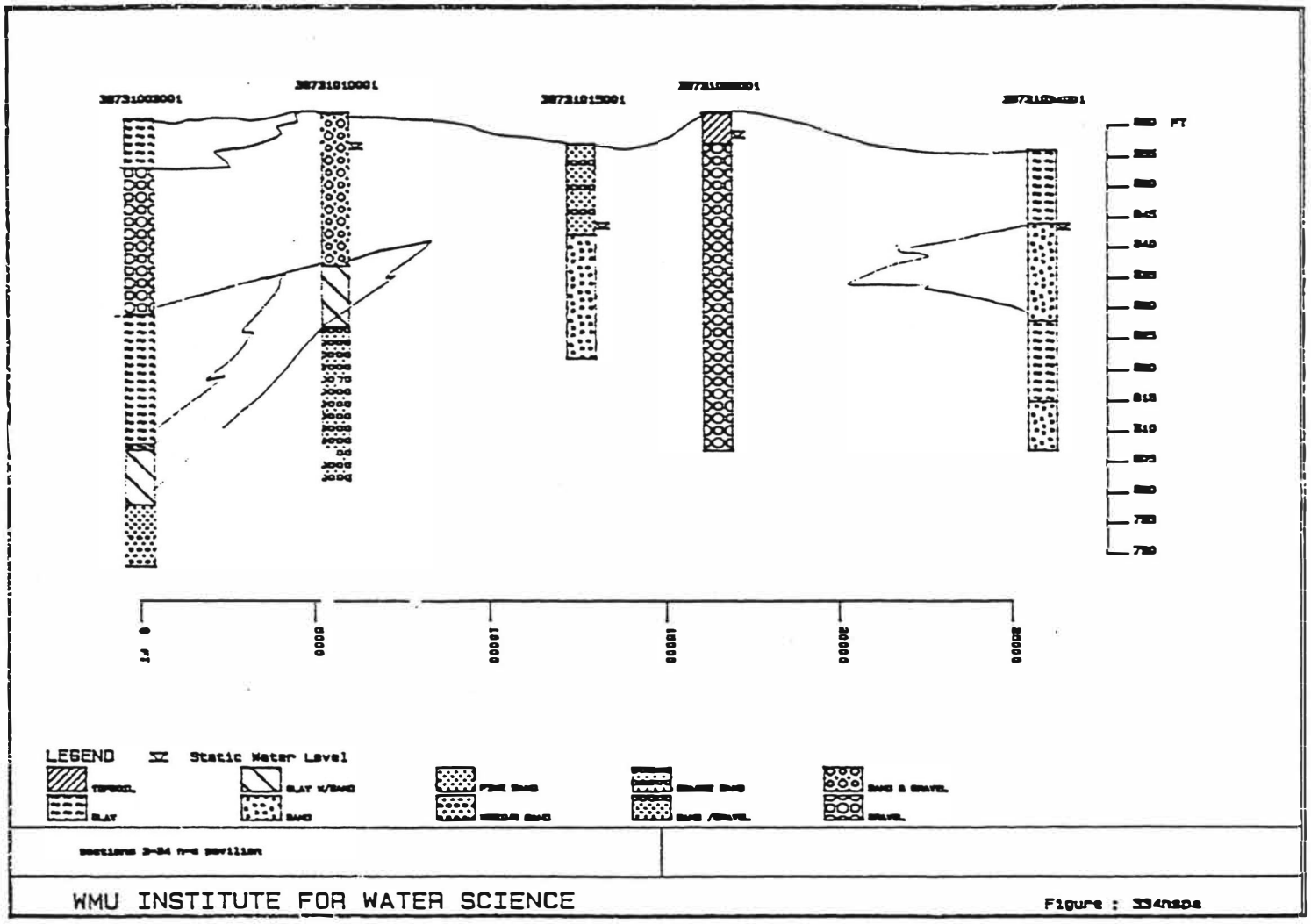
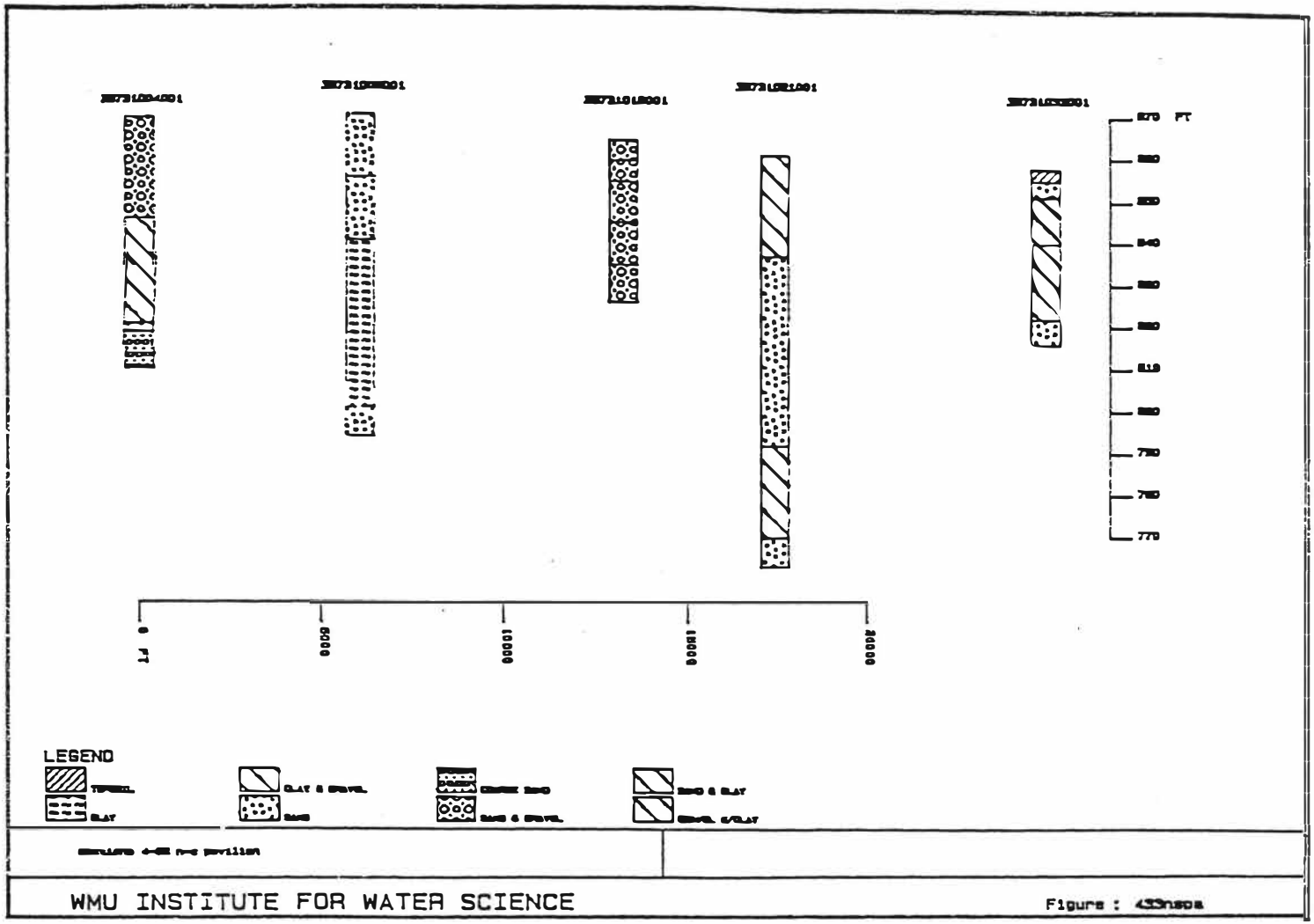
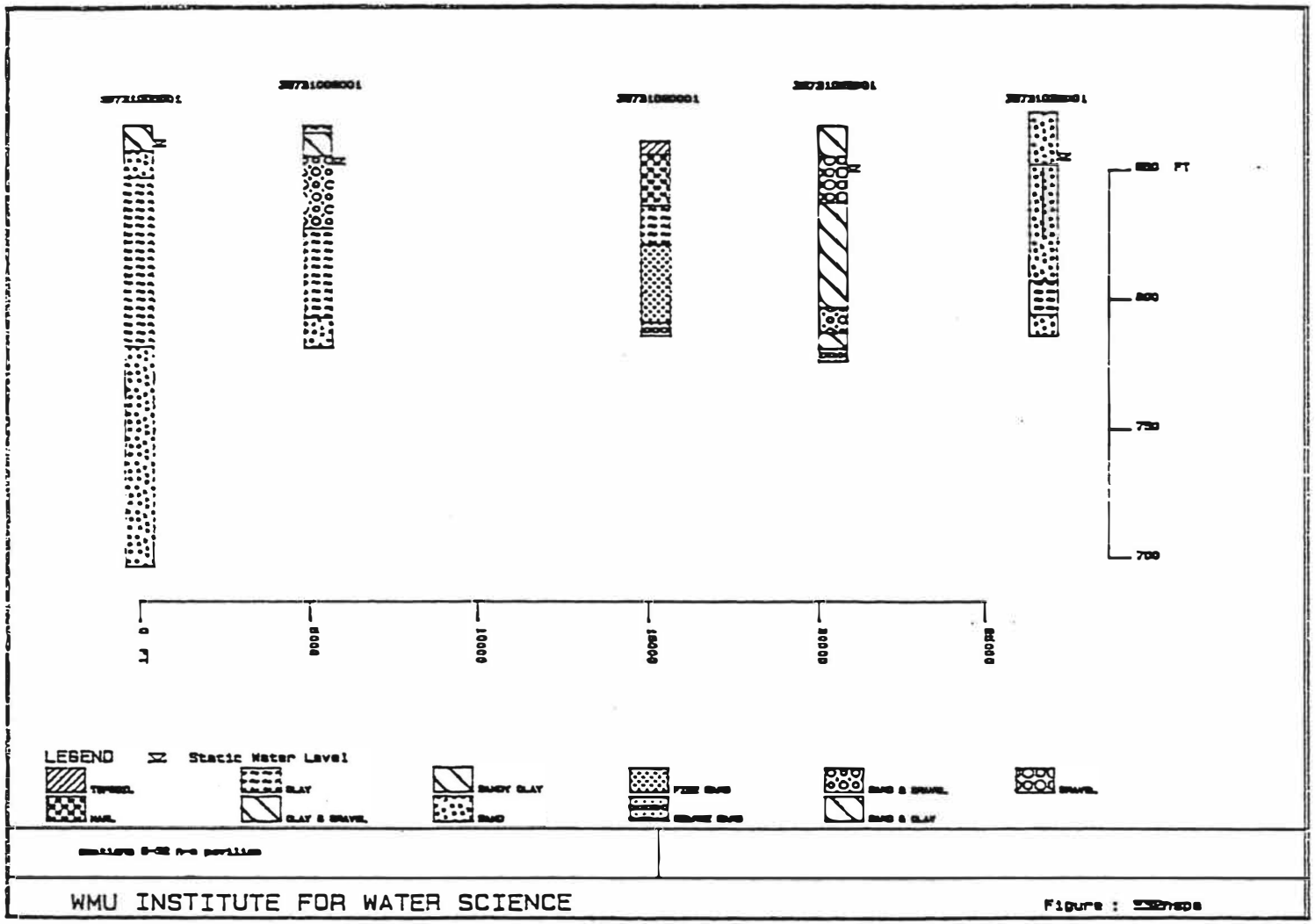
Figure :


WMU INSTITUTE FOR WATER SCIENCE
LEGEND
Static Water Level
CLAY
0 FT


WMU INSTITUTE FOR WATER SCIENCE

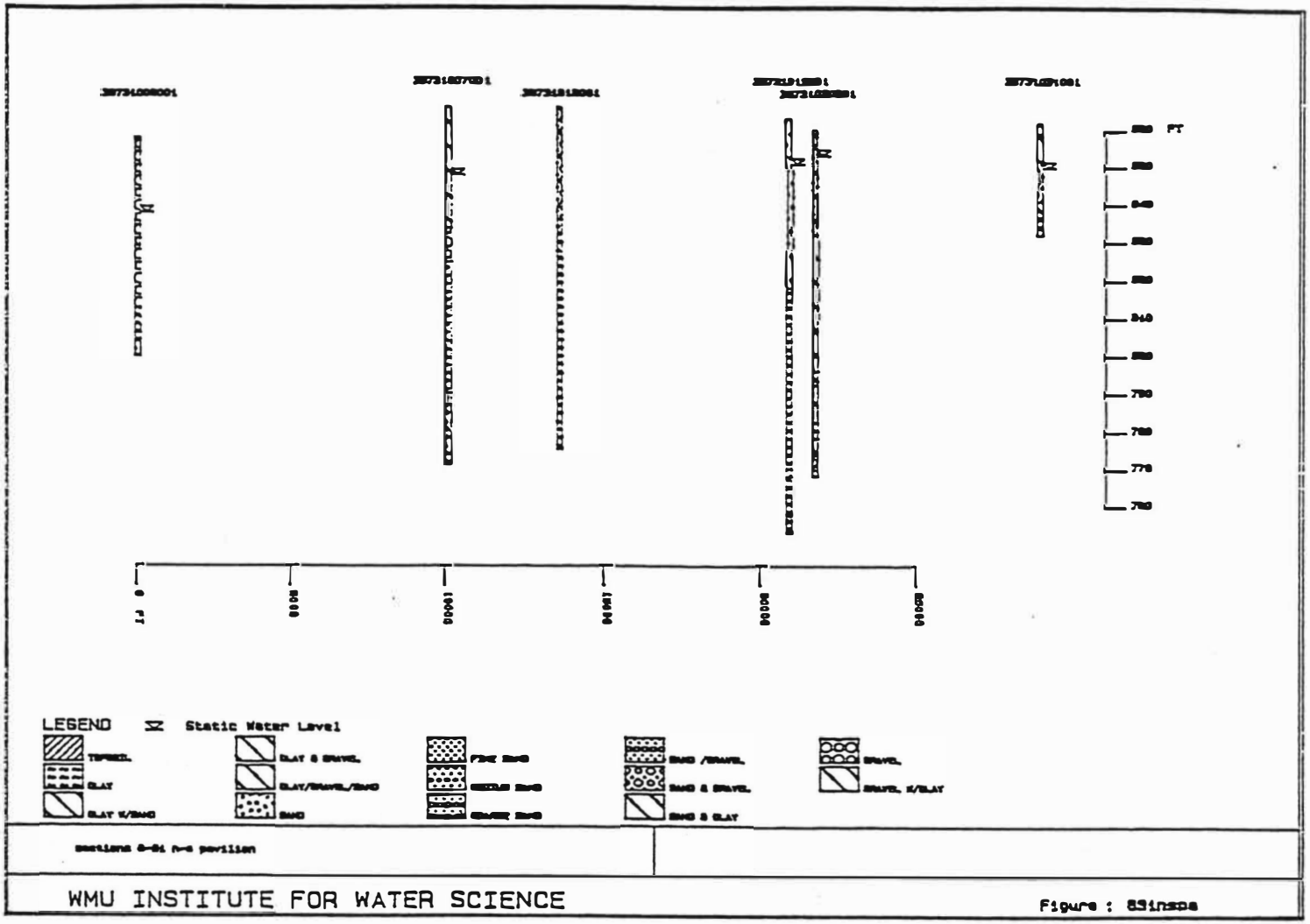

LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE

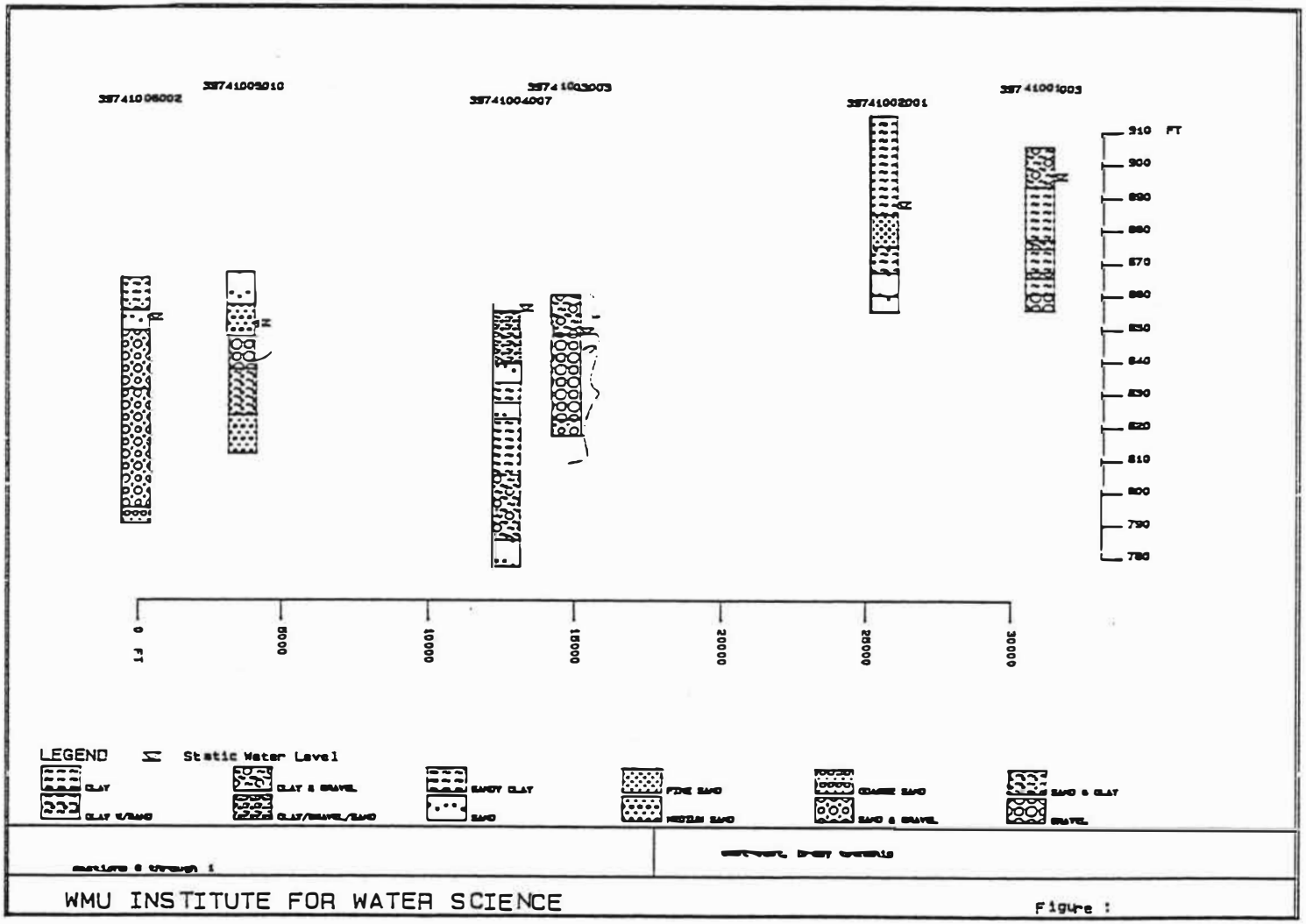

LEGEND
WMU INSTITUTE FOR WATER SCIENCE



WMU INSTITUTE FOR WATER SCIENCE

Figure :


LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE


397410006002
397410002910
397410004007
397410003003
397410002001
397410001003
910 FT
900
890
880
870
860
850
840
830
820
810
800
790
780
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
CLAY
CLAY & GRAVEL
SANDY CLAY
FINE SAND
COARSE SAND
SAND & CLAY
CLAY & SAND
CLAY/GRAVEL/SAND
SAND
MEDIUM SAND
SAND & GRAVEL
GRAVEL
WMU INSTITUTE FOR WATER SCIENCE
Figure :

LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE
Figure :

LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE

LEGEND
WMU INSTITUTE FOR WATER SCIENCE

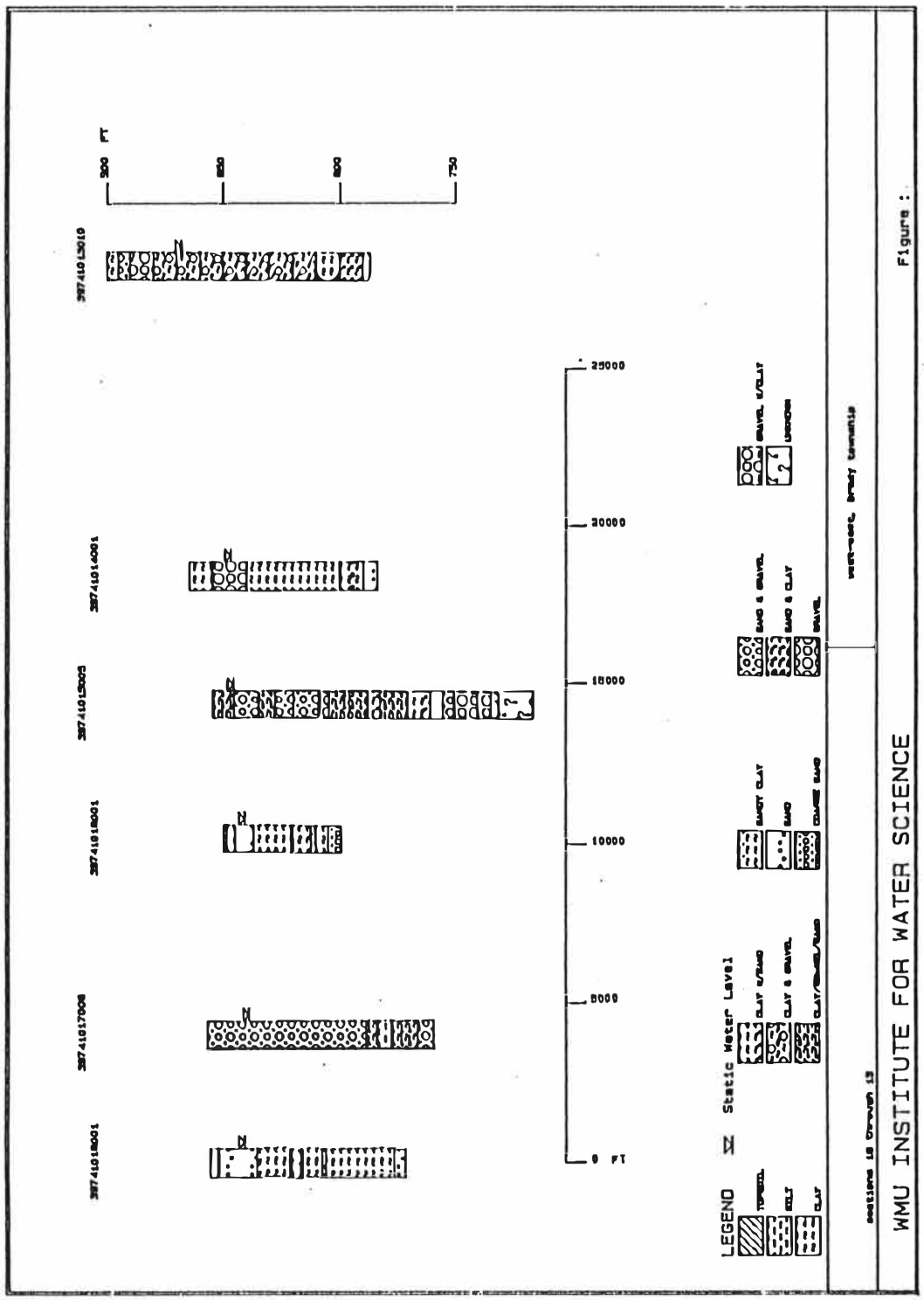
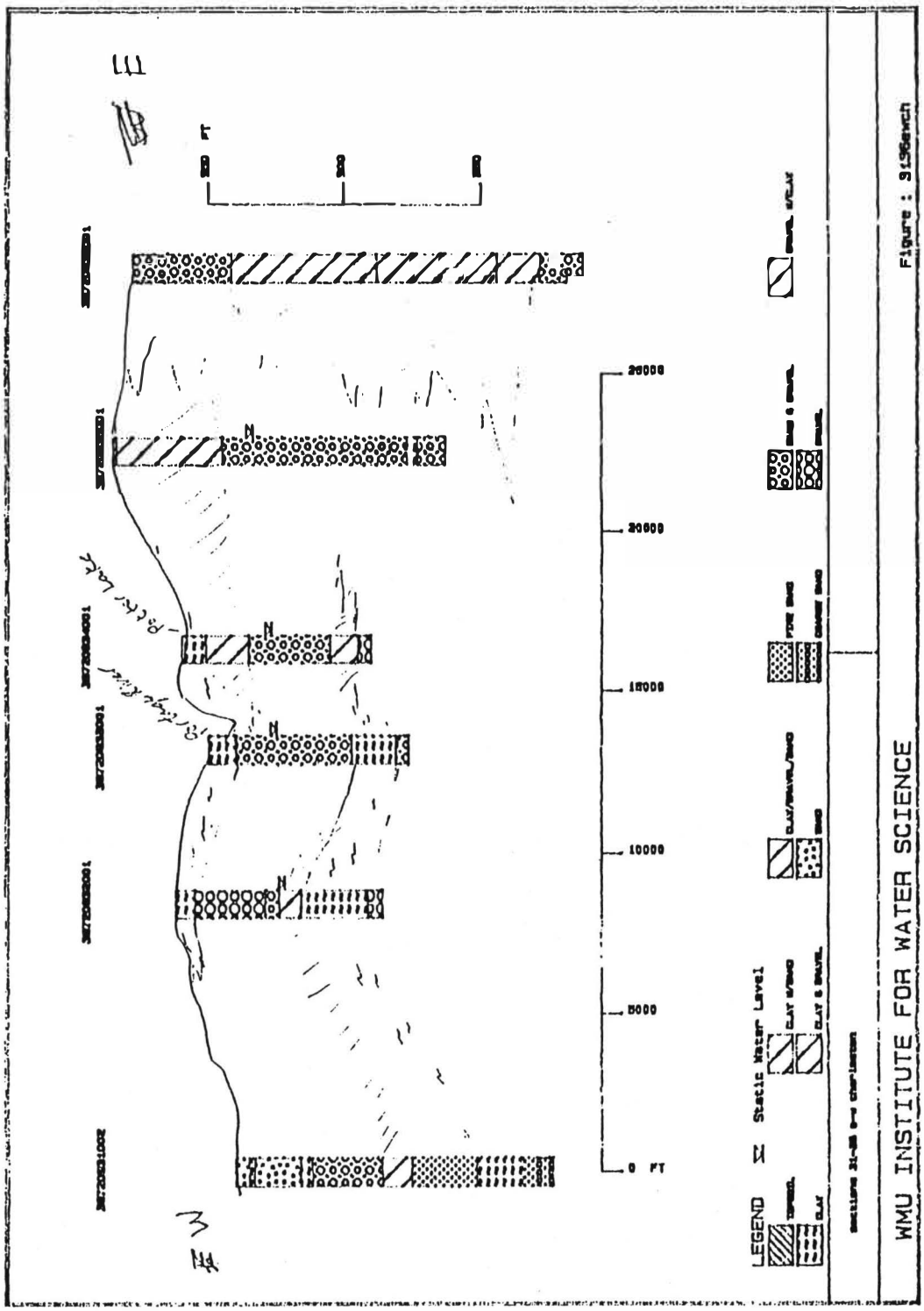
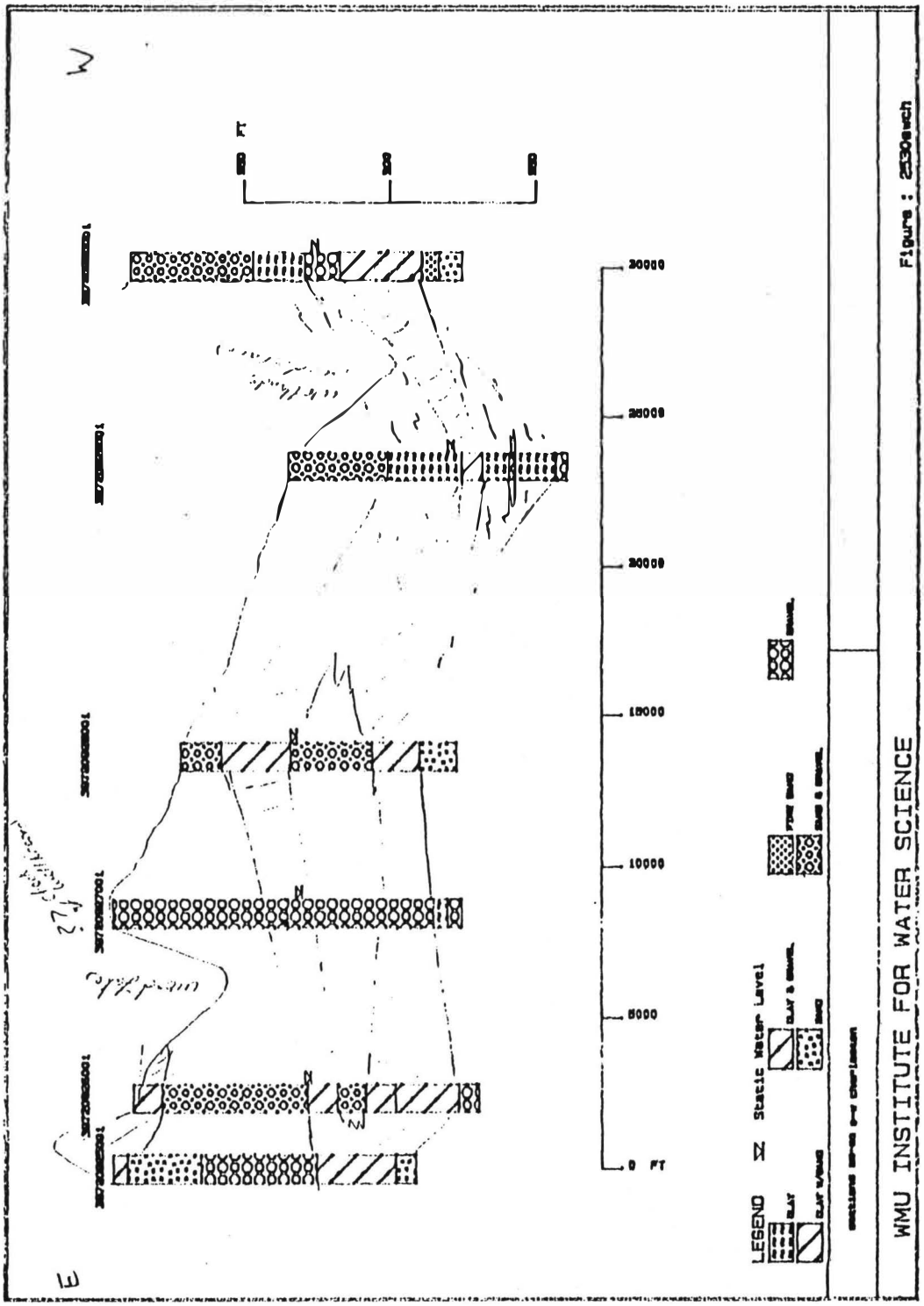
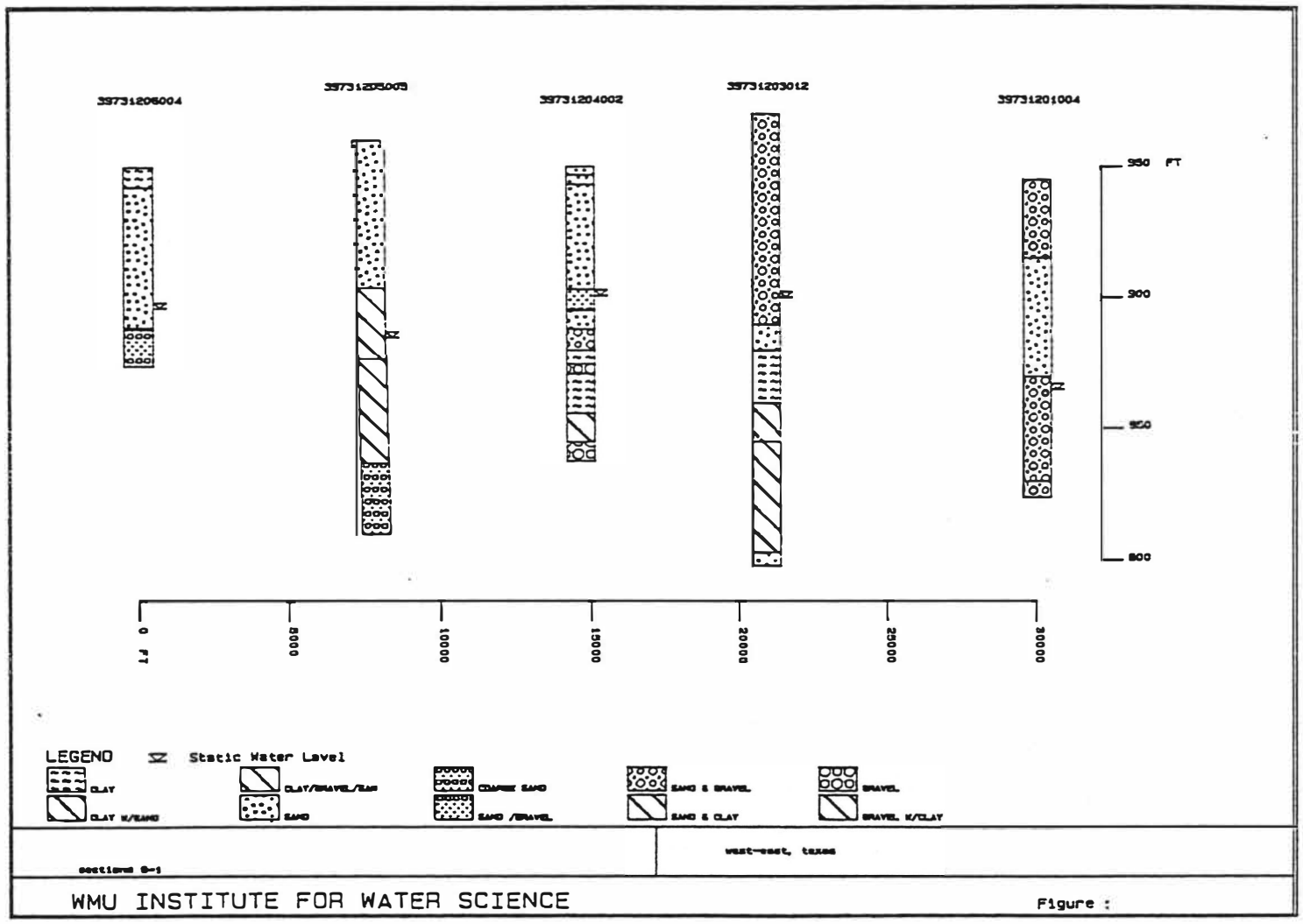

WMU INSTITUTE FOR WATER SCIENCE
LEGEND
Static Water Level
CLAY
SILT
GRAVEL
CLAY & GRAVEL
CLAY & SAND
SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
COARSE SAND
SHALE
LIMESTONE
0 FT
5000
10000
15000
20000
25000
500
650
800
750
FT

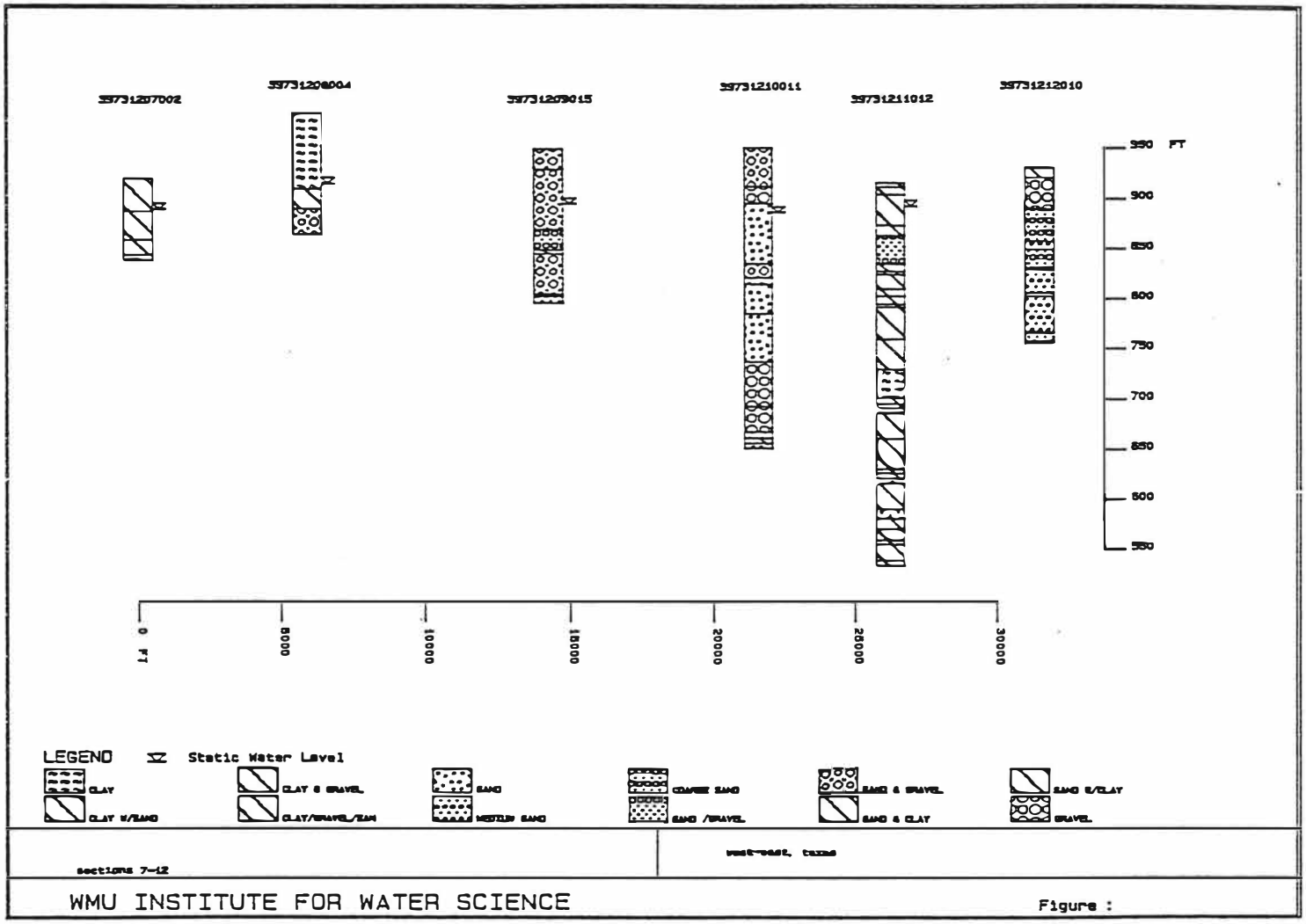
Figure :

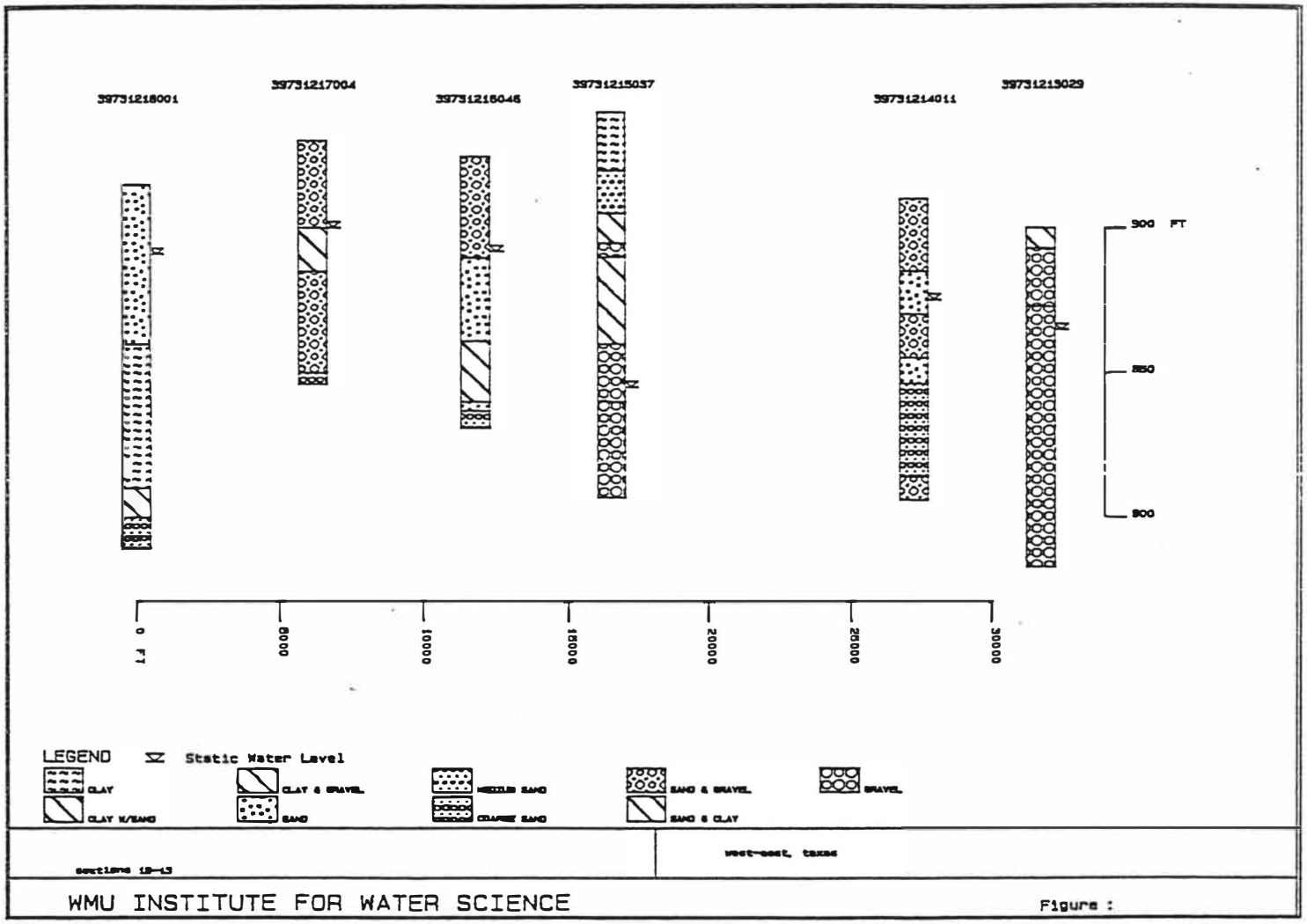
LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE

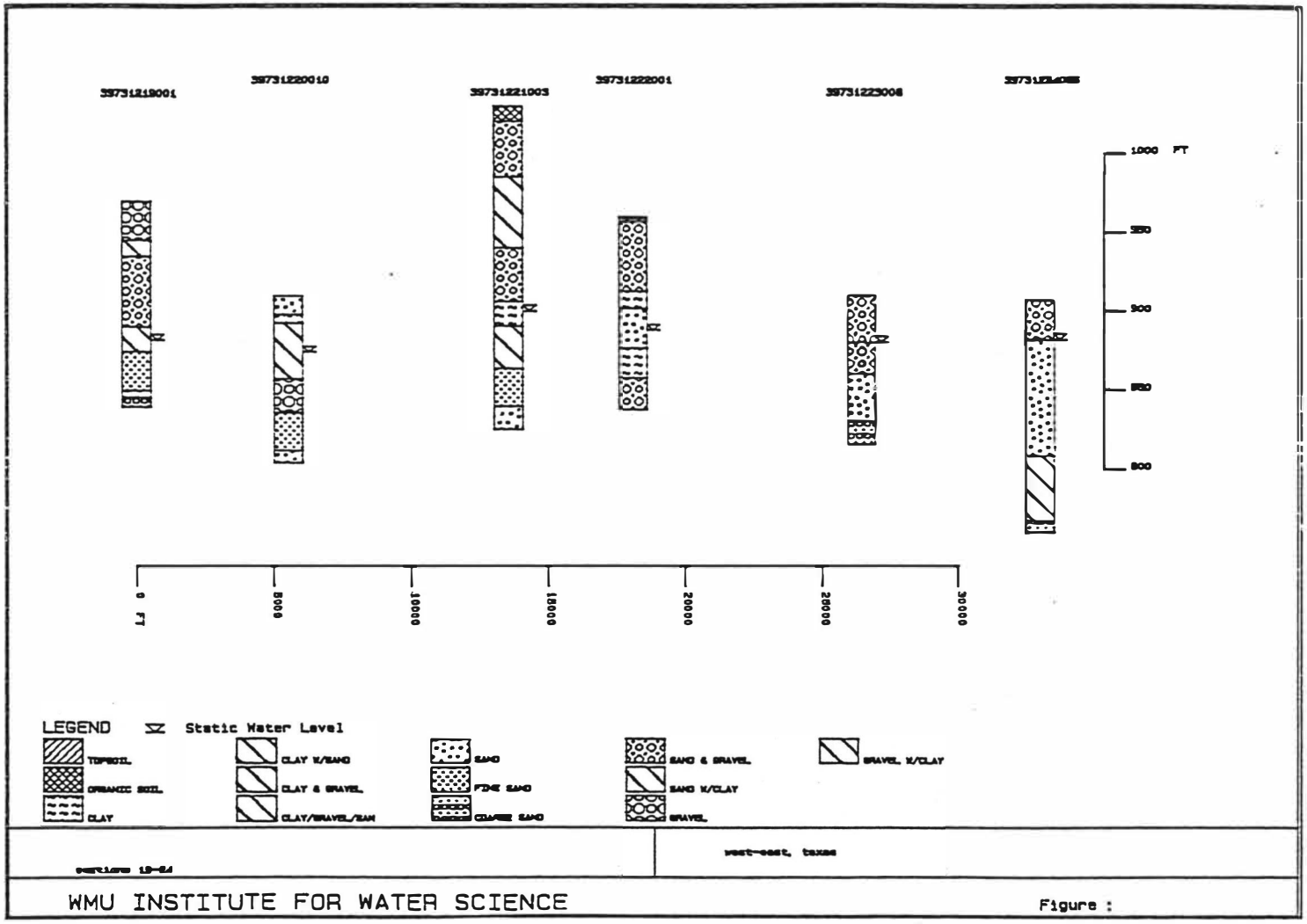

WMU INSTITUTE FOR WATER SCIENCE
LEGEND
Static Water Level
0 FT

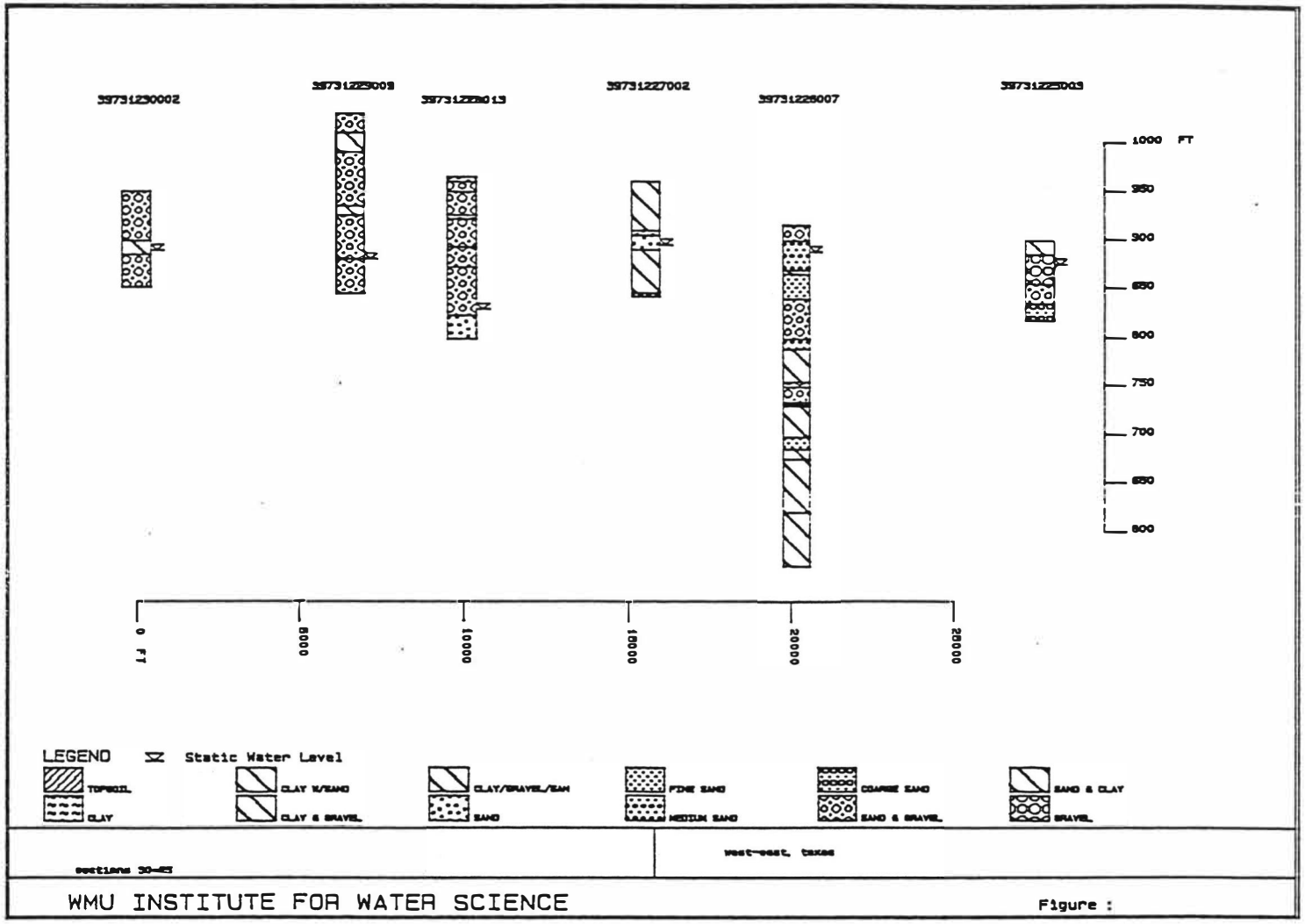

W
E
30000
25000
20000
15000
10000
5000
0 FT
LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE
Figure : 2330each


39731206004
39731205003
39731204002
39731203012
39731201004
950 FT
900
850
800
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
CLAY
CLAY W/SAND
CLAY/GRAVEL/SAN
SAND
COARSE SAND
SAND /GRAVEL
SAND & GRAVEL
SAND & CLAY
GRAVEL
GRAVEL W/CLAY
sections B-1
west-east, texas
WMU INSTITUTE FOR WATER SCIENCE
Figure :


397312097002
397312098004
397312099015
397312100011
397312110012
397312120010
950 FT
900
850
800
750
700
650
600
550
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
CLAY
CLAY W/SAND
CLAY & GRAVEL
CLAY/GRAVEL/SAN
SAND
MEDIUM SAND
COARSE SAND
SAND /GRAVEL
SAND & GRAVEL
SAND & CLAY
SAND W/CLAY
GRAVEL
sections 7-12
west-east, texas
WMU INSTITUTE FOR WATER SCIENCE
Figure :


397312180O1
397312170O4
397312160O6
397312150O7
397312140I1
397312130O9
300 FT
250
200
0 FT
50000
100000
150000
200000
250000
300000
LEGEND
Static Water Level
CLAY
CLAY & GRAVEL
MEDIUM SAND
SAND & GRAVEL
GRAVEL
CLAY W/SAND
SAND
COARSE SAND
SAND & CLAY
WMU INSTITUTE FOR WATER SCIENCE
Figure :


397312219001
397312220010
397312221003
397312222001
397312223006
1000 FT
950
900
850
800
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
TOPSOIL
ORGANIC SOIL
CLAY
CLAY W/SAND
CLAY & GRAVEL
CLAY/GRAVEL/SAN
SAND
FINE SAND
COARSE SAND
SAND & GRAVEL
SAND W/CLAY
GRAVEL
GRAVEL W/CLAY
overview 19-84
west-east, texas
WMU INSTITUTE FOR WATER SCIENCE
Figure :


397312300002
397312250008
397312280013
397312270002
397312280007
397312250003
1000 FT
950
900
850
800
750
700
650
600
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
TOPSOIL
CLAY
CLAY W/SAND
CLAY & GRAVEL
CLAY/GRAVEL/SAM
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
sections 30-45
west-east, texas
WMU INSTITUTE FOR WATER SCIENCE
Figure :

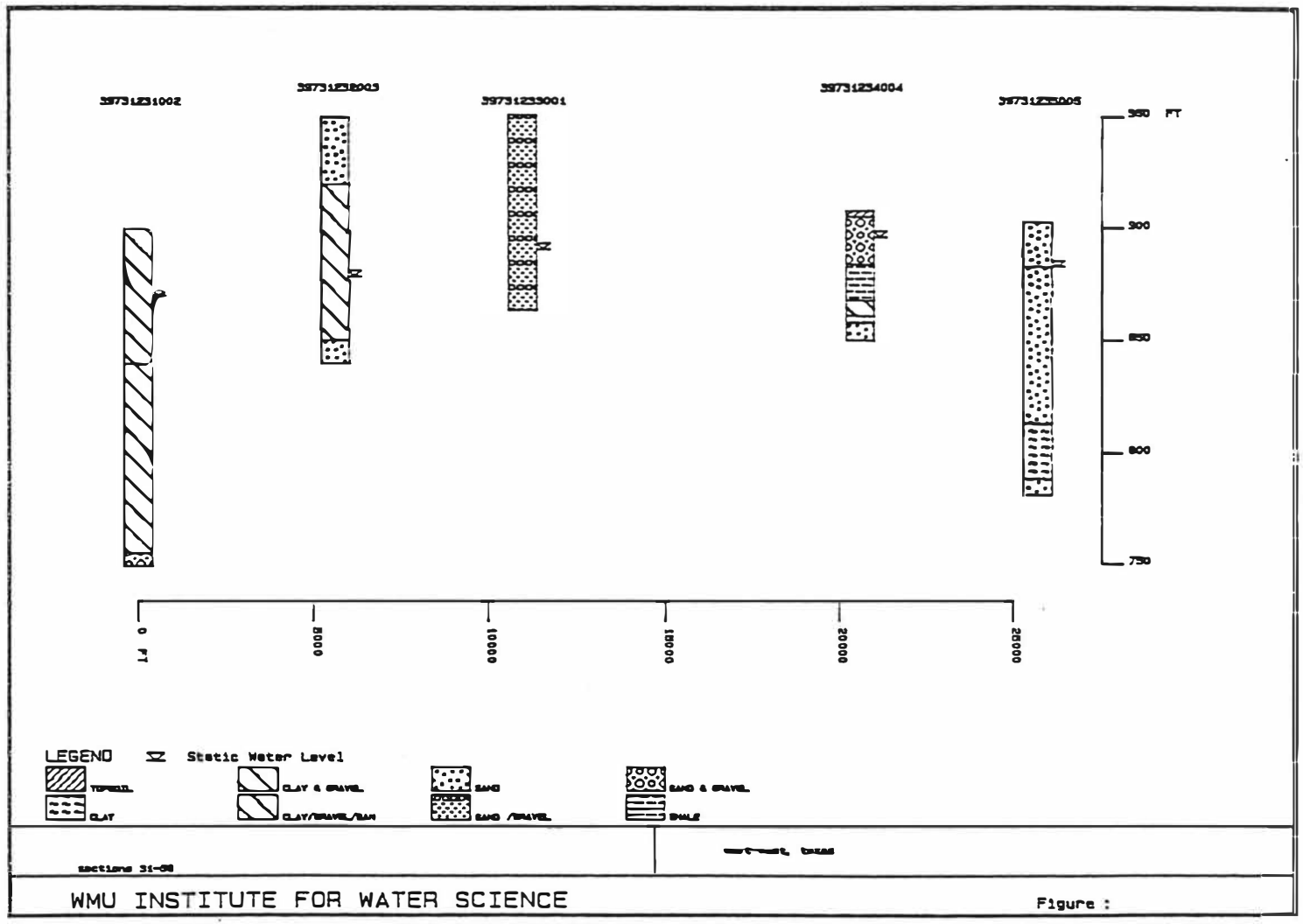


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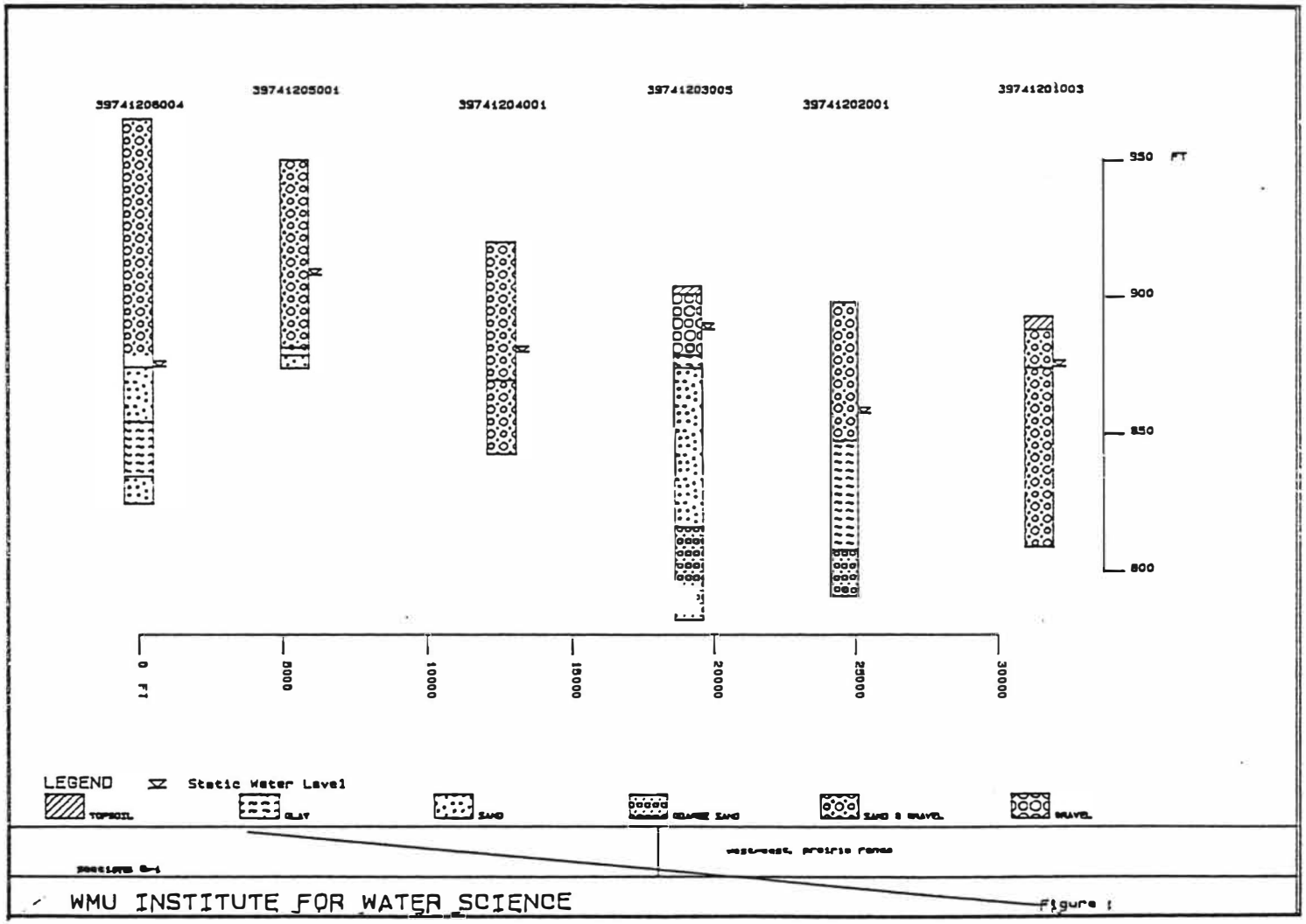
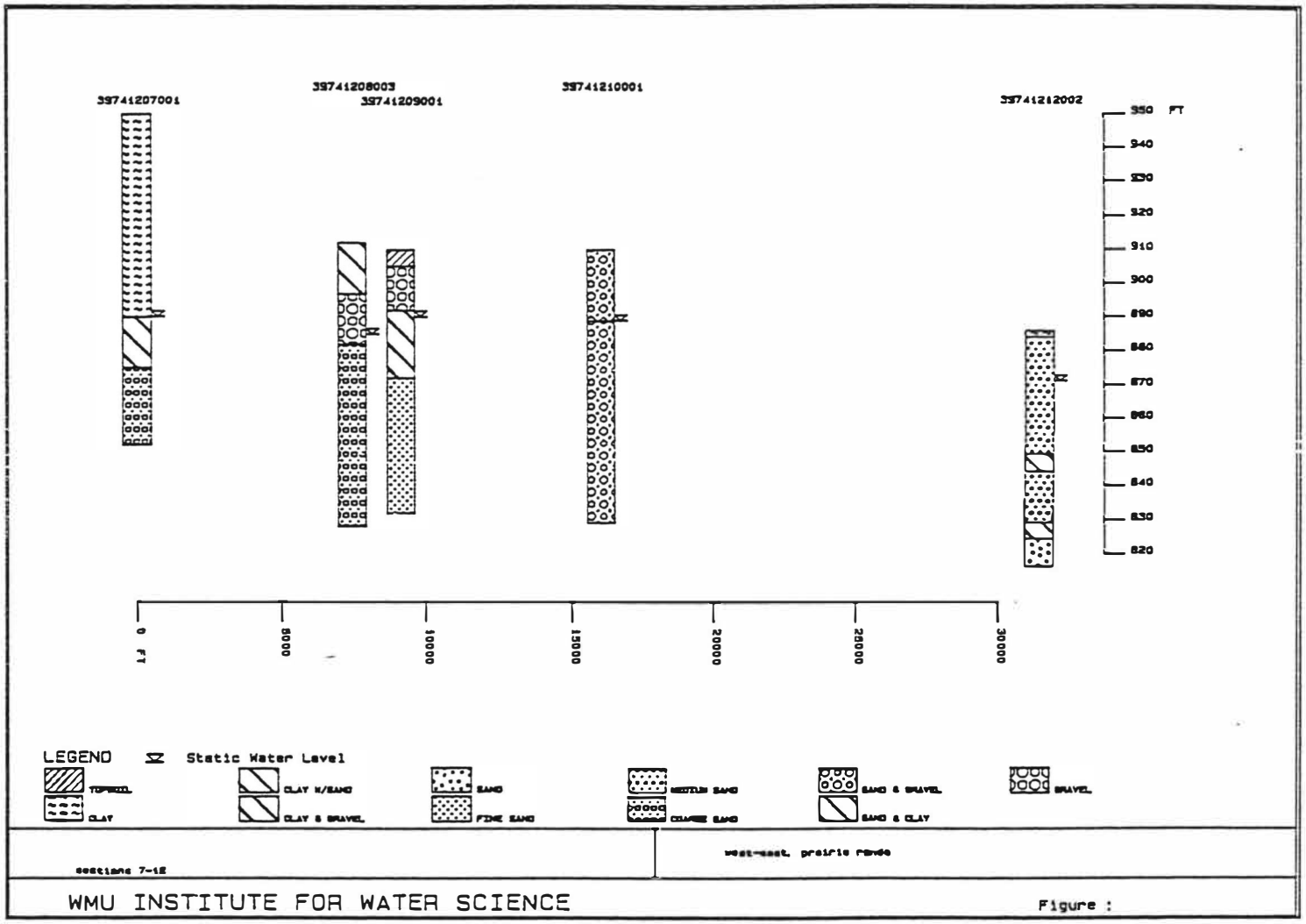
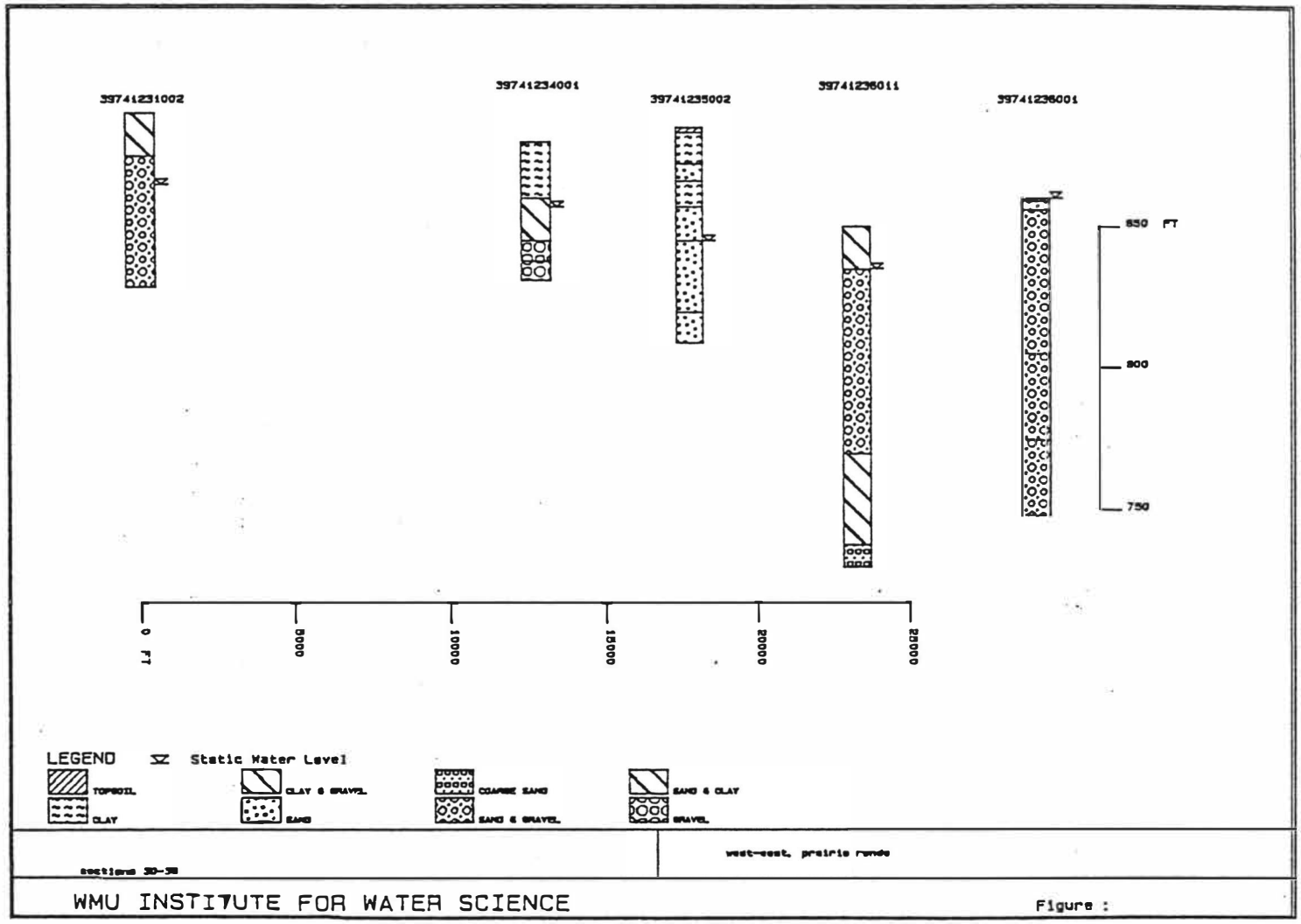
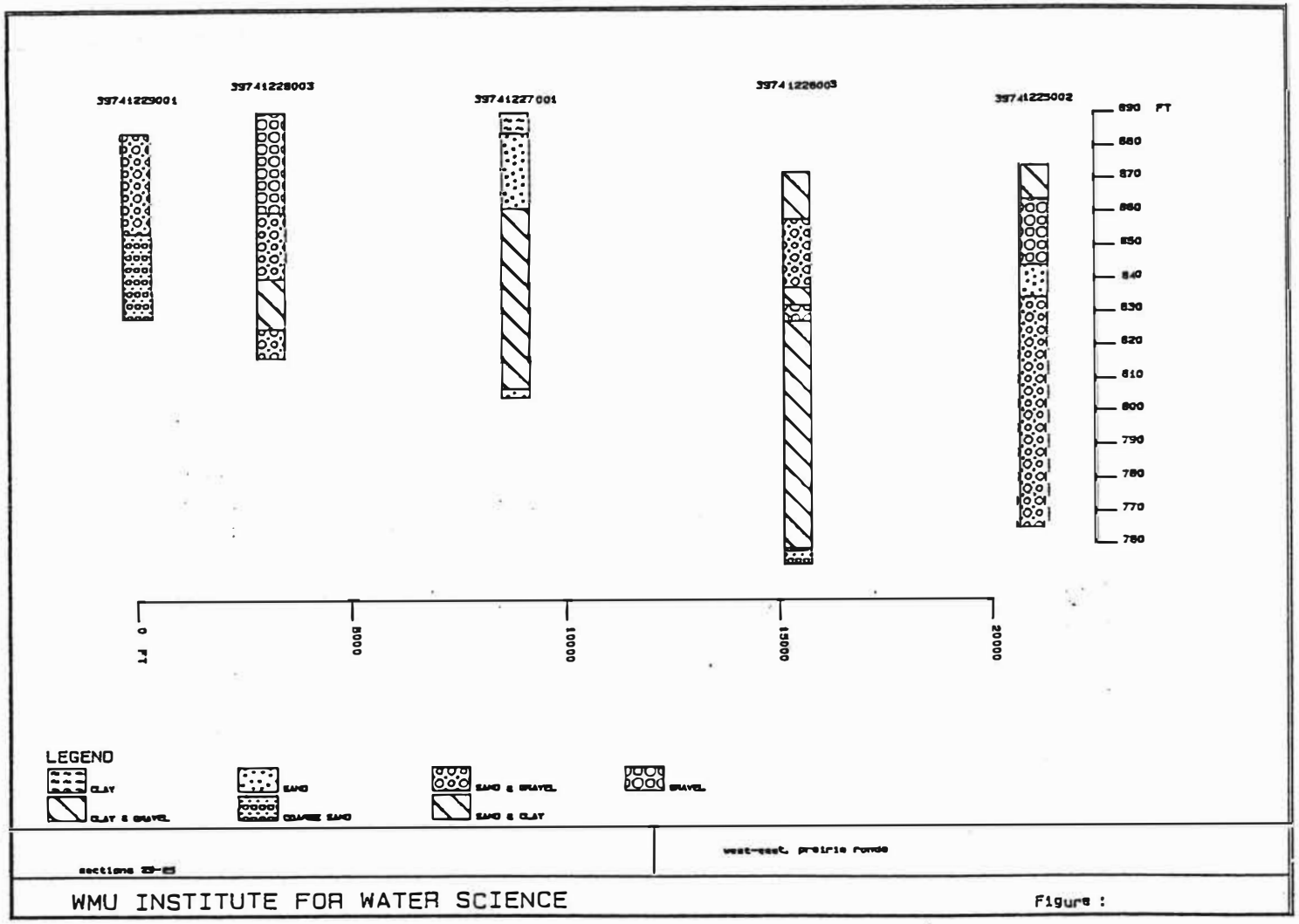
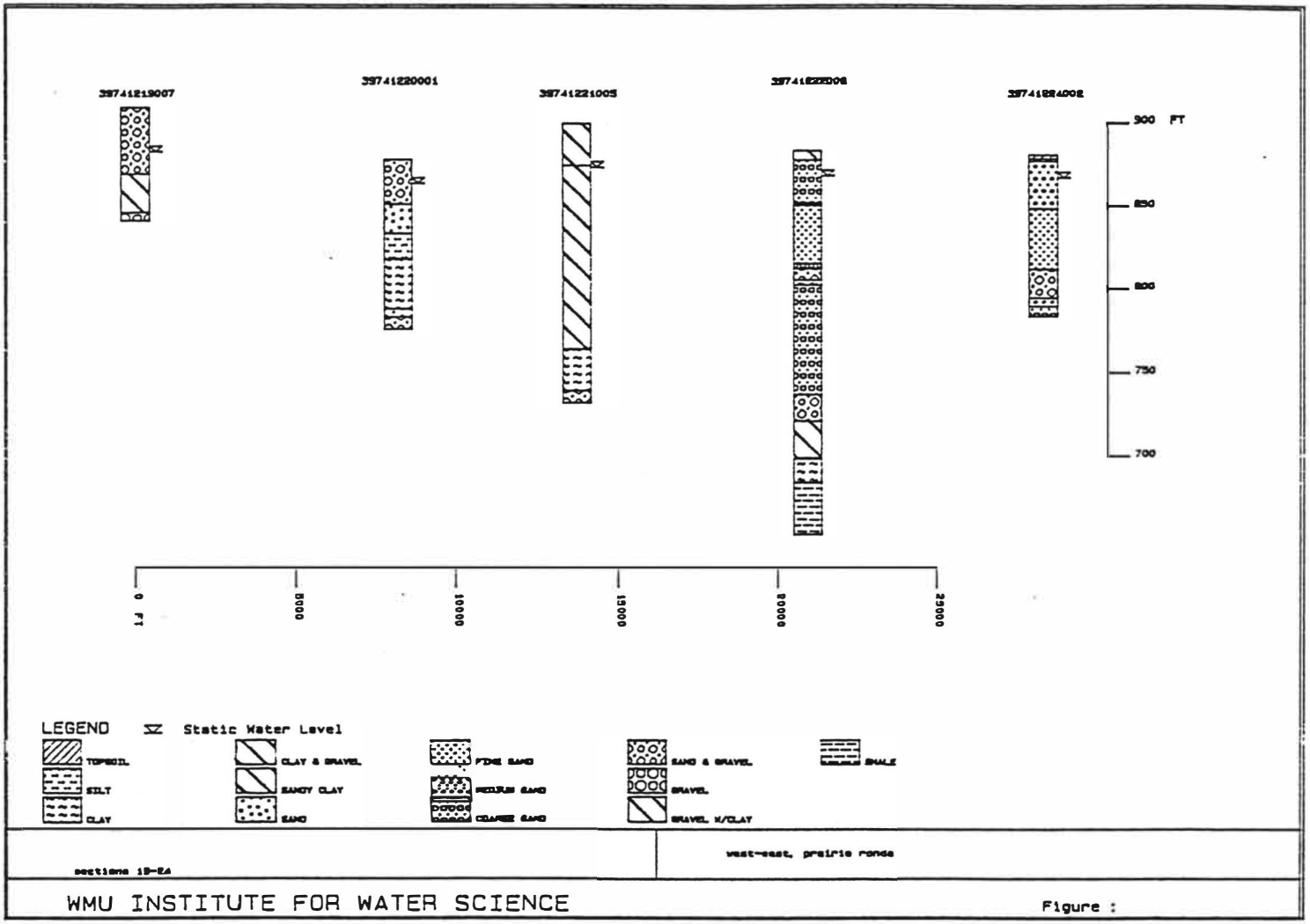
Figure :


39741206004
39741205001
39741204001
39741203005
39741202001
39741201003
950 FT
900
850
800
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
TOPSOIL
CLAY
SAND
COARSE SAND
SAND & GRAVEL
GRAVEL
WMU INSTITUTE FOR WATER SCIENCE
Figure 1


39741207001
39741208003
39741209001
39741210001
39741212002
350 FT
340
330
320
310
300
290
280
270
260
250
240
230
220
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
TOPSOIL
CLAY
CLAY W/SAND
CLAY & GRAVEL
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
sections 7-12
west-east prairie ronde
WMU INSTITUTE FOR WATER SCIENCE
Figure :


39741231002
39741234001
39741235002
39741236011
39741236001
850 FT
800
750
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
TOPSOIL
CLAY
CLAY & GRAVEL
SAND
COARSE SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
sections 30-38
west-east, prairie ronde
WMU INSTITUTE FOR WATER SCIENCE
Figure :


397412290O1
397412280O3
397412270O1
397412260O3
397412250O2
690 FT
680
670
660
650
640
630
620
610
600
790
780
770
760
0 FT
5000
10000
15000
20000
LEGEND
CLAY
CLAY & GRAVEL
SAND
COARSE SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
sections 29-25
west-east, prairie ronde
WMU INSTITUTE FOR WATER SCIENCE
Figure :


39741219007
39741220001
39741221005
39741222006
39741224002
900 FT
850
800
750
700
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
TOPSOIL
SILT
CLAY
CLAY & GRAVEL
SANDY CLAY
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND & GRAVEL
GRAVEL
GRAVEL W/CLAY
SHALE
sections 19-24
west-east, prairie ronde
WMU INSTITUTE FOR WATER SCIENCE
Figure :

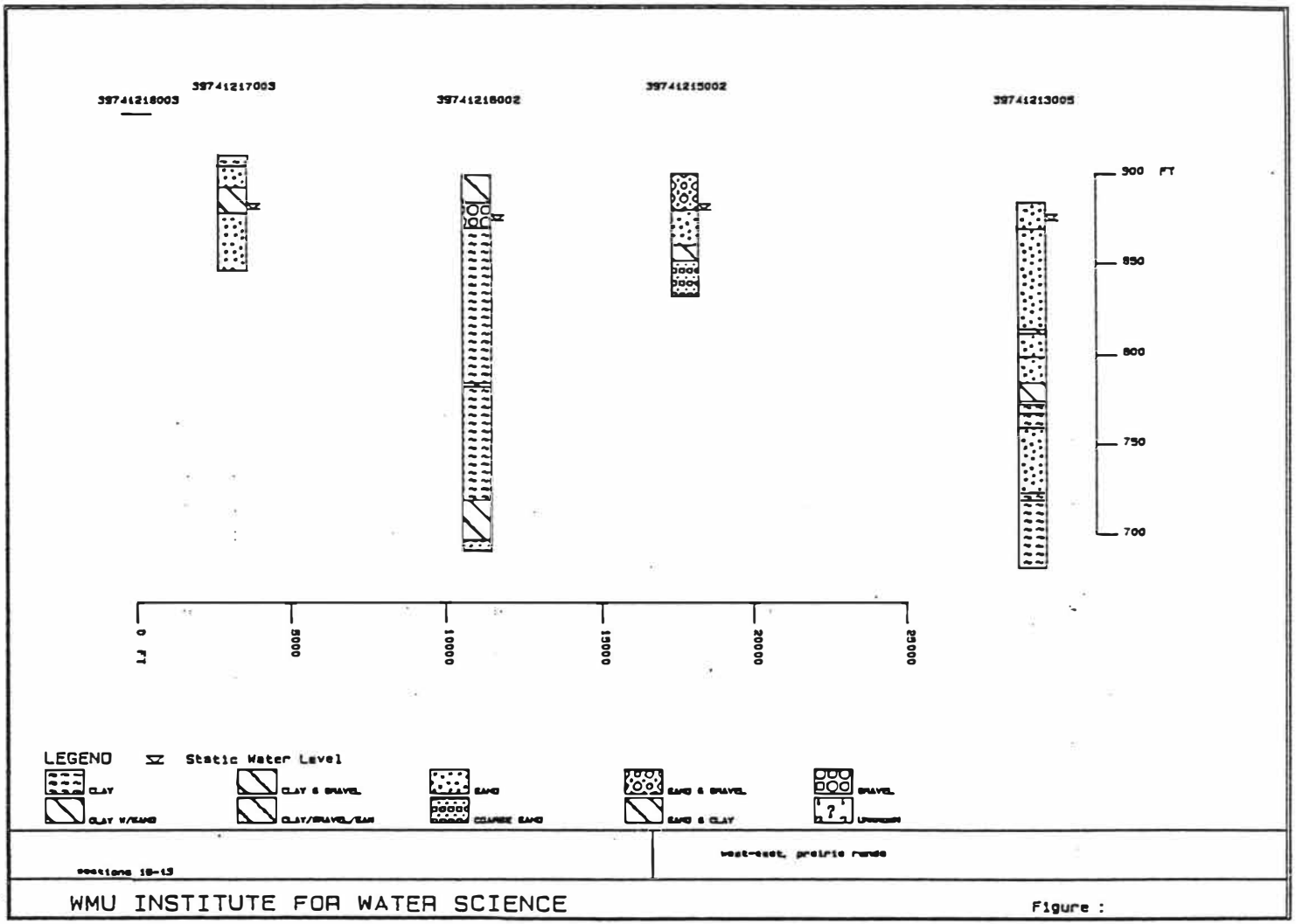


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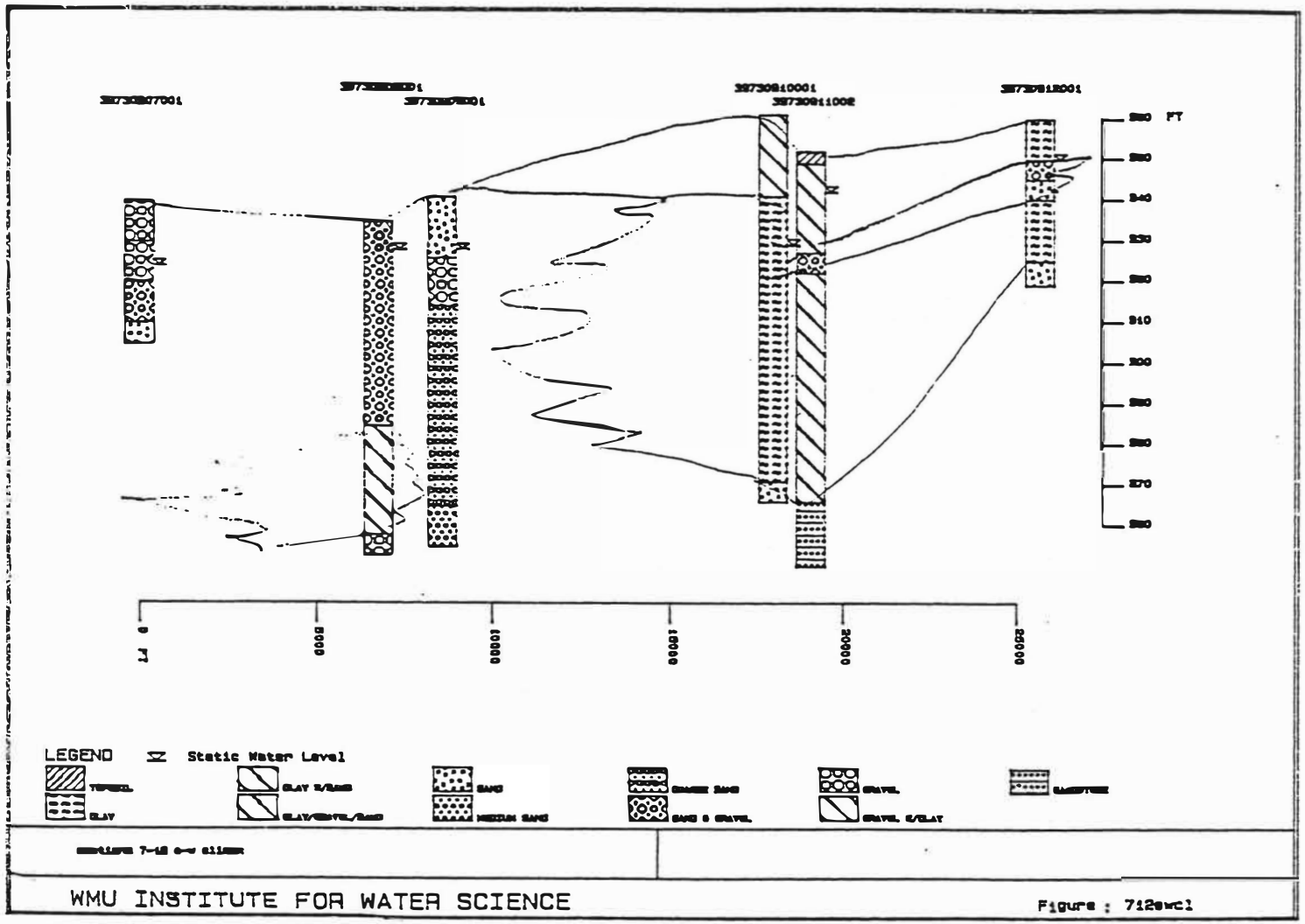
Figure :

LEGEND
Static Water Level
CLAY
CLAY & GRAVEL
CLAY/GRAVEL/SAND
SAND
FINE SAND
SAND & GRAVEL
SAND & CLAY
SAND W/CLAY
GRAVEL
GRAVEL W/CLAY
WMU INSTITUTE FOR WATER SCIENCE
Figure : 15ewc1


LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE
Figure : 712swc1

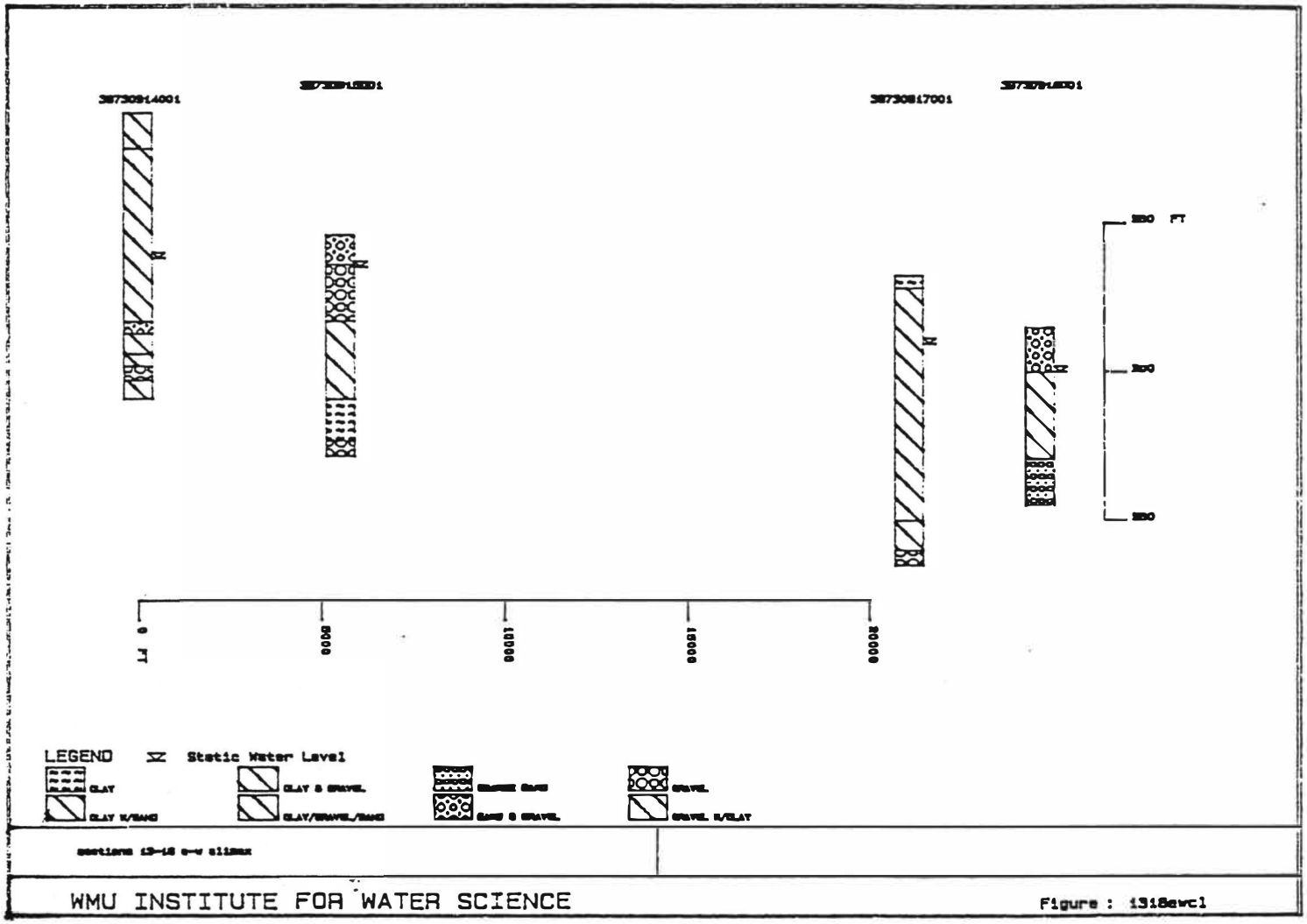


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Figure : 1318swcl

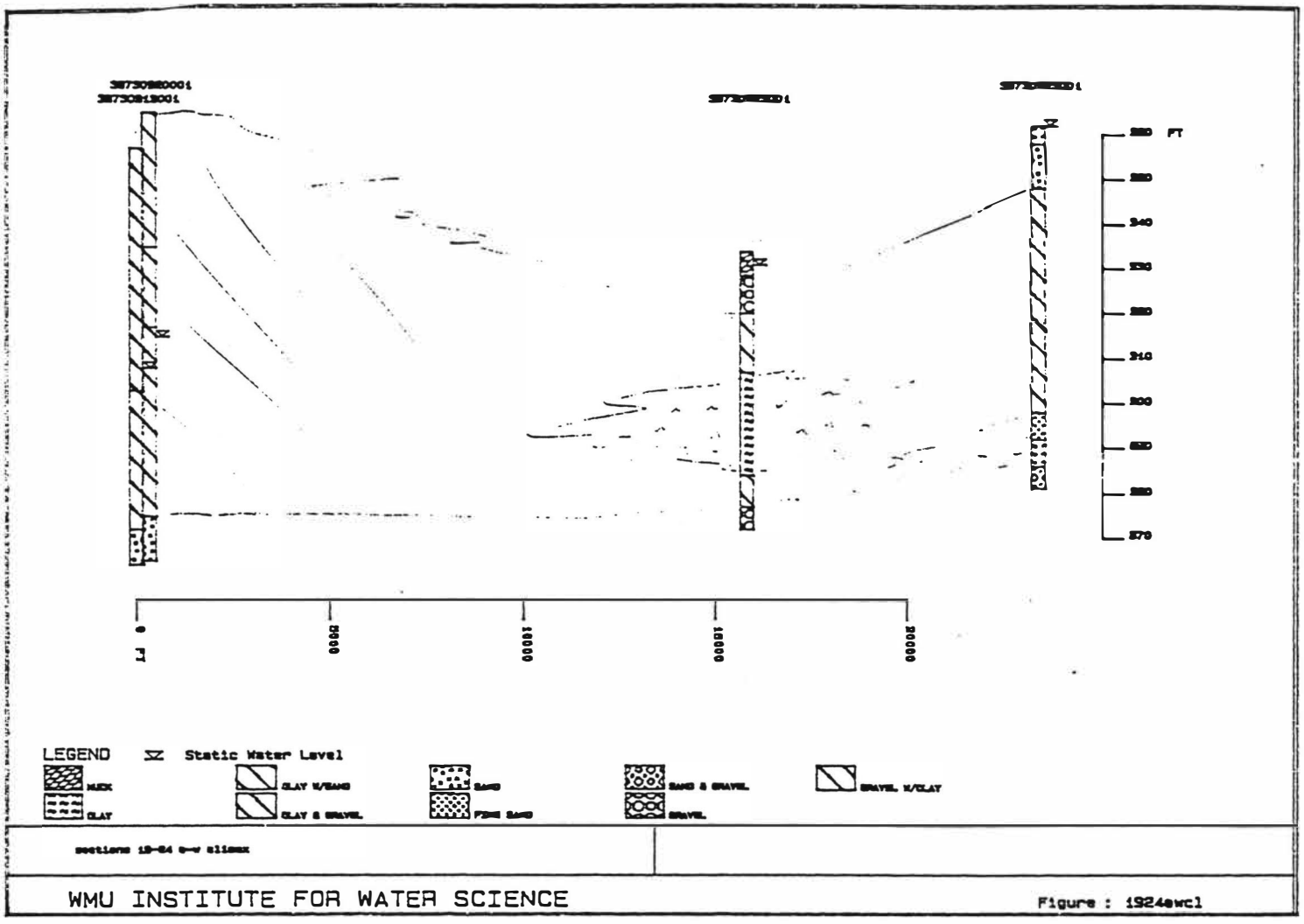
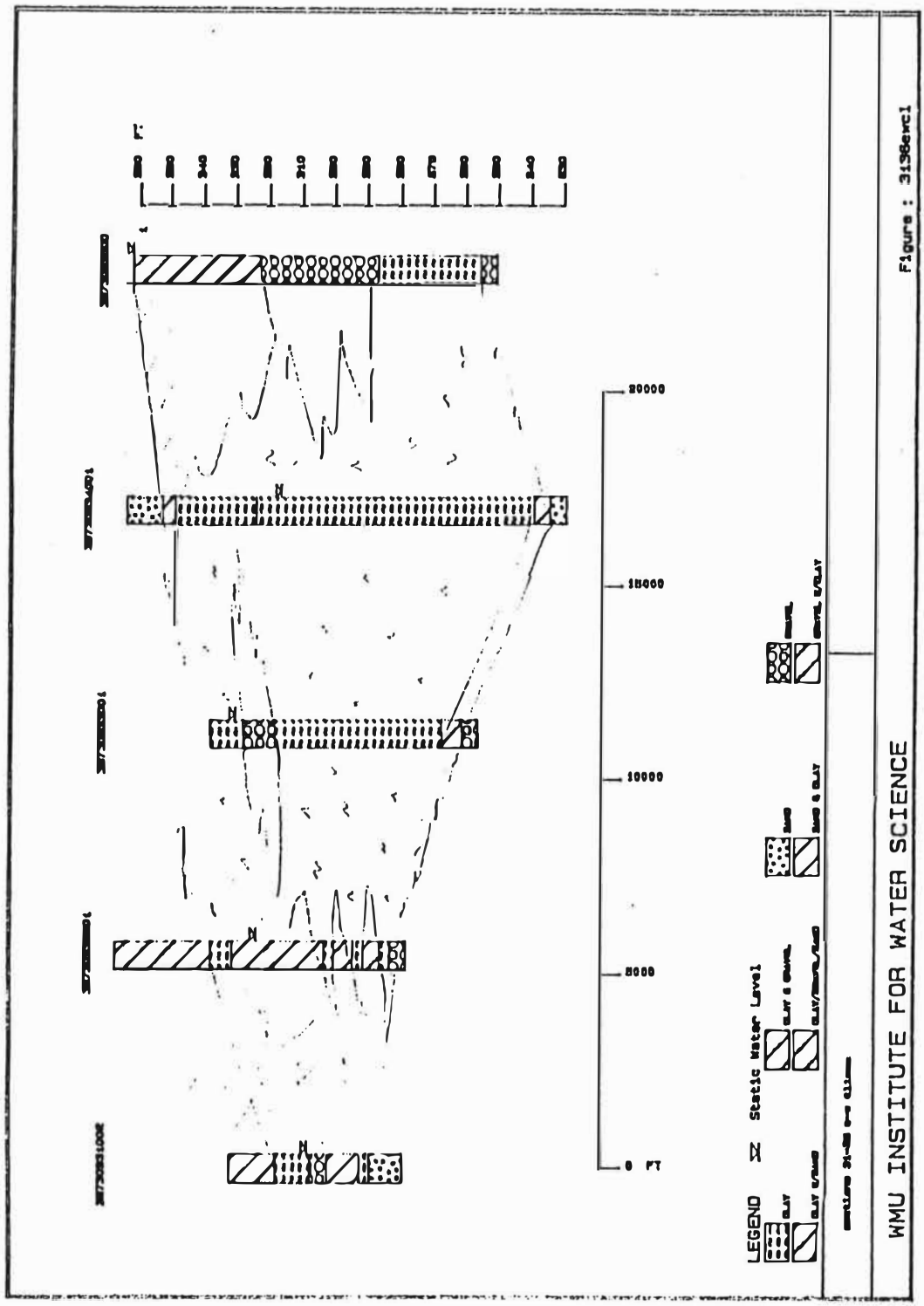
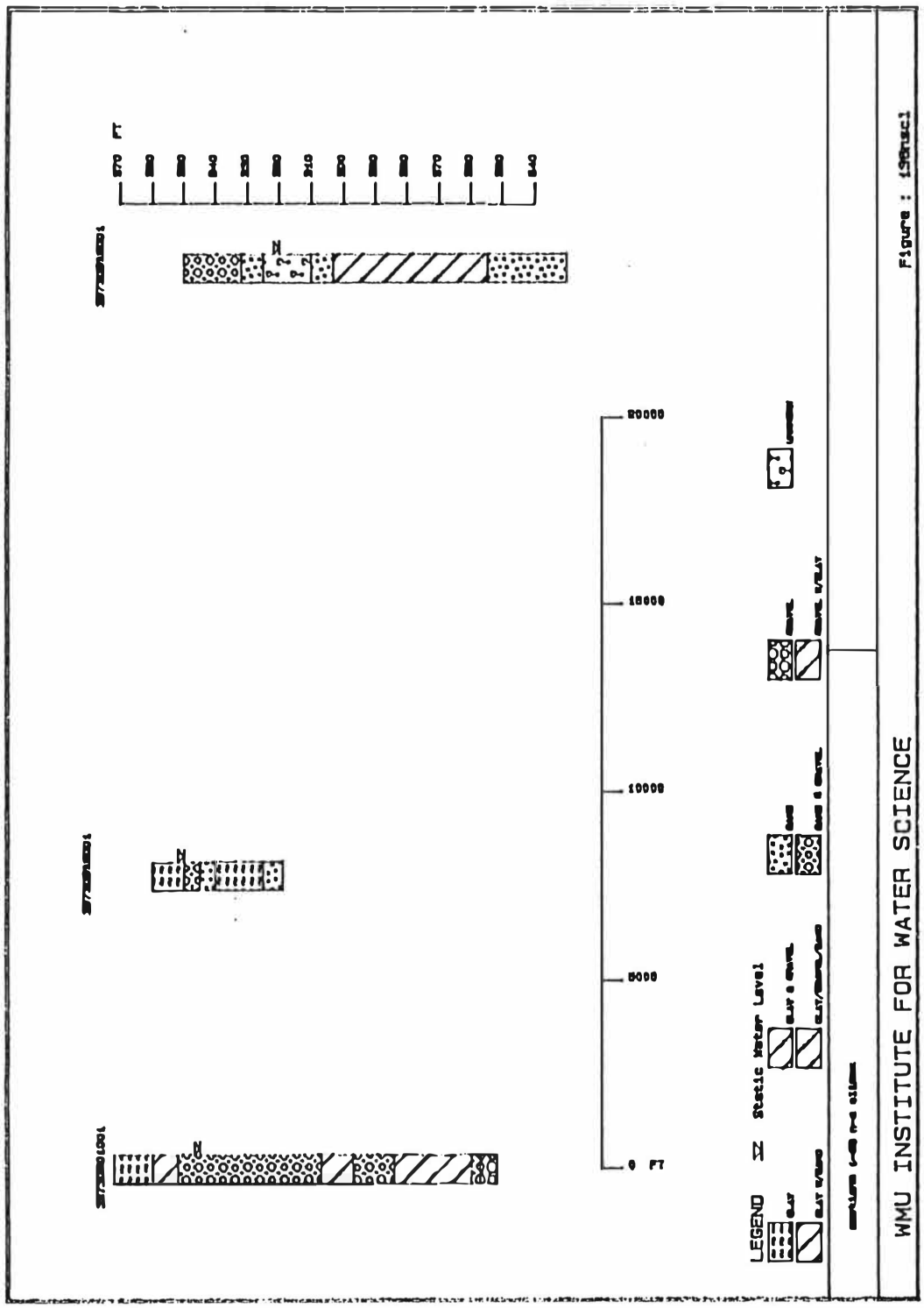

LEGEND
Static Water Level
MUCK
CLAY
CLAY W/SAND
CLAY & GRAVEL
SAND
FINE SAND
SAND & GRAVEL
GRAVEL
GRAVEL W/CLAY
FT
0
5000
10000
15000
20000
WMU INSTITUTE FOR WATER SCIENCE
Figure : 1924swc1

Figure : 2530ewc1


20000
15000
10000
5000
0 FT
LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE
Figure : 3136wc1


WMU INSTITUTE FOR WATER SCIENCE
LEGEND
Static Water Level
20000
15000
10000
5000
0 FT

LEGEND
Static Water Level
WMU INSTITUTE FOR WATER SCIENCE
Figure : 334nsc1

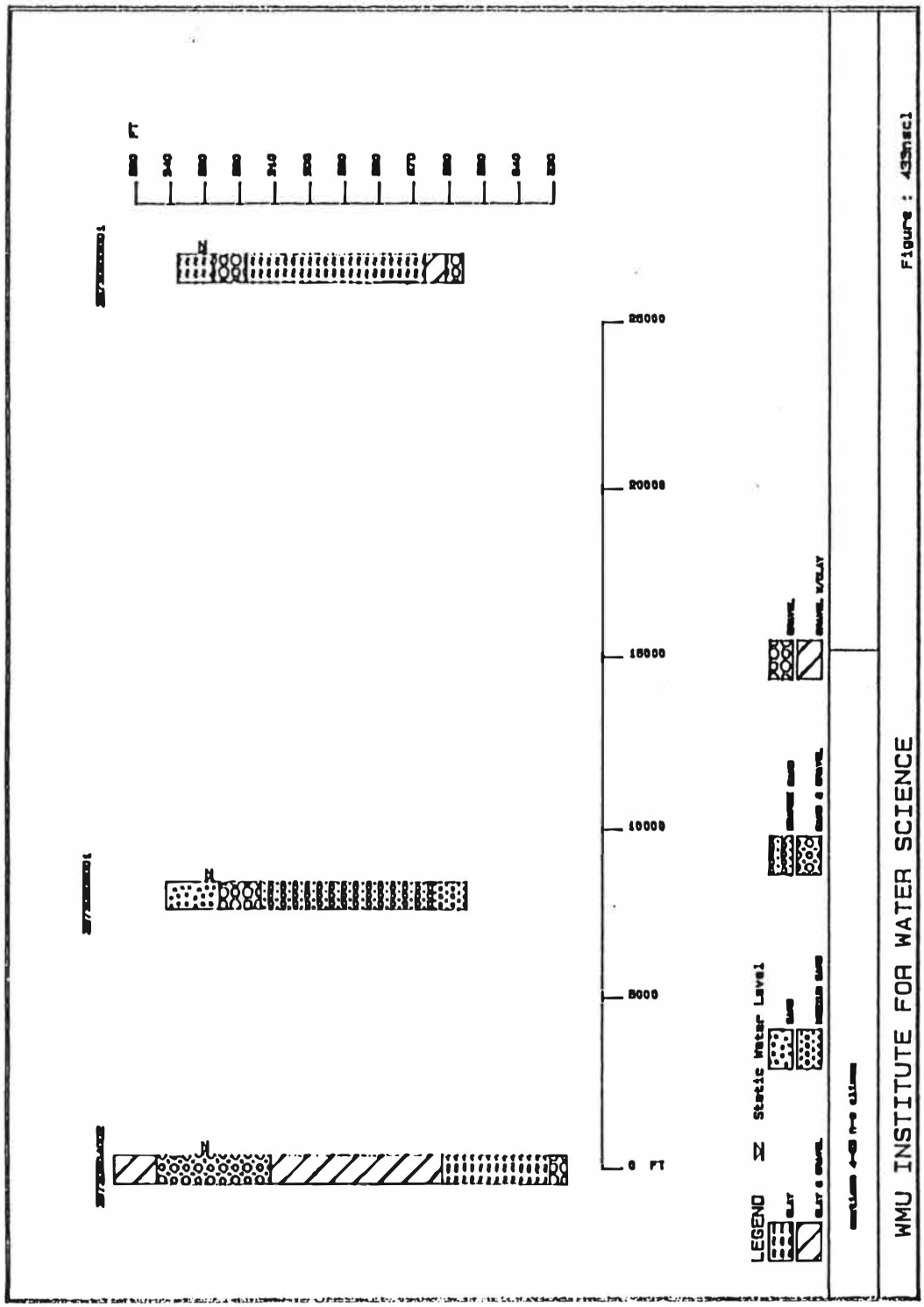
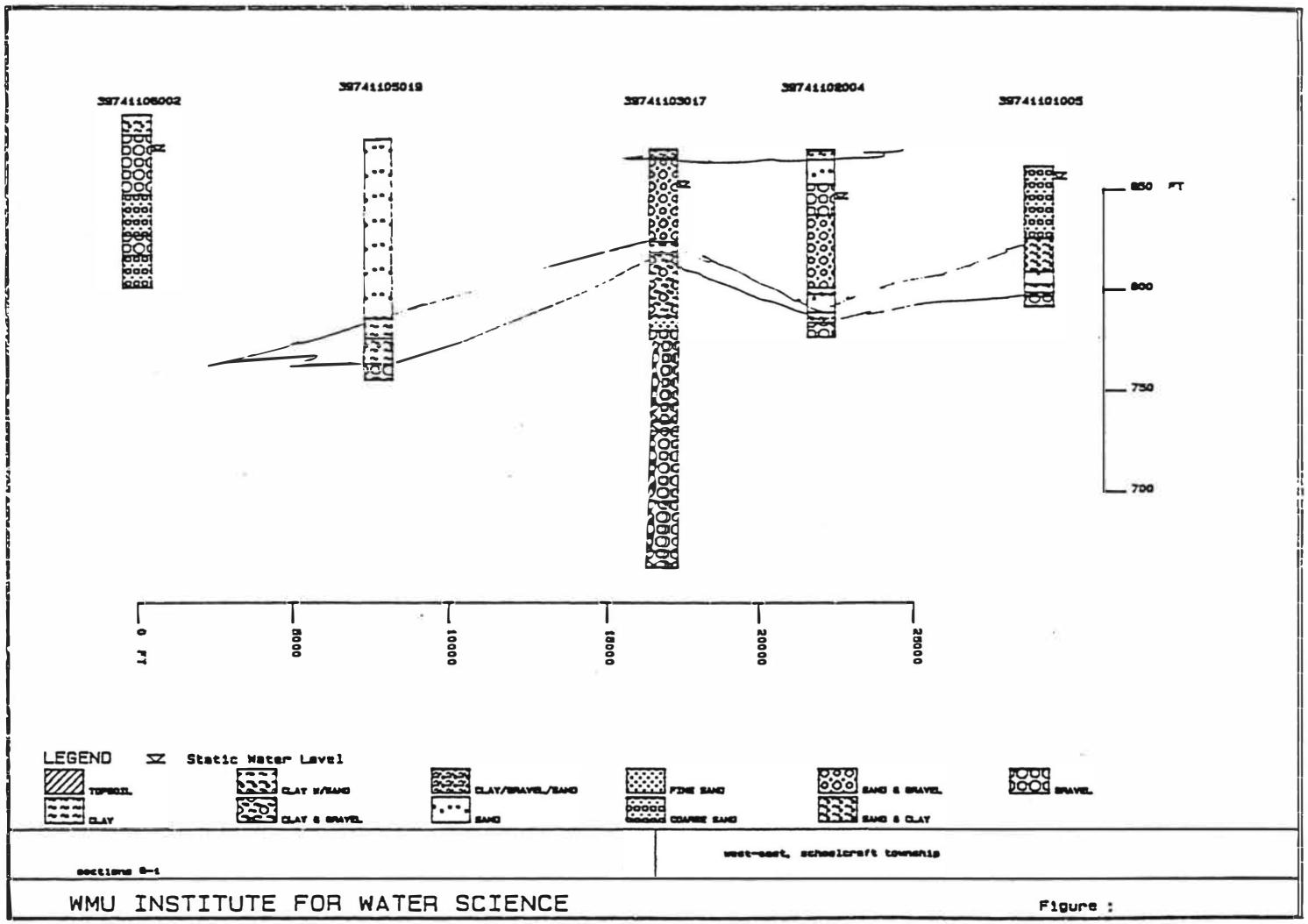
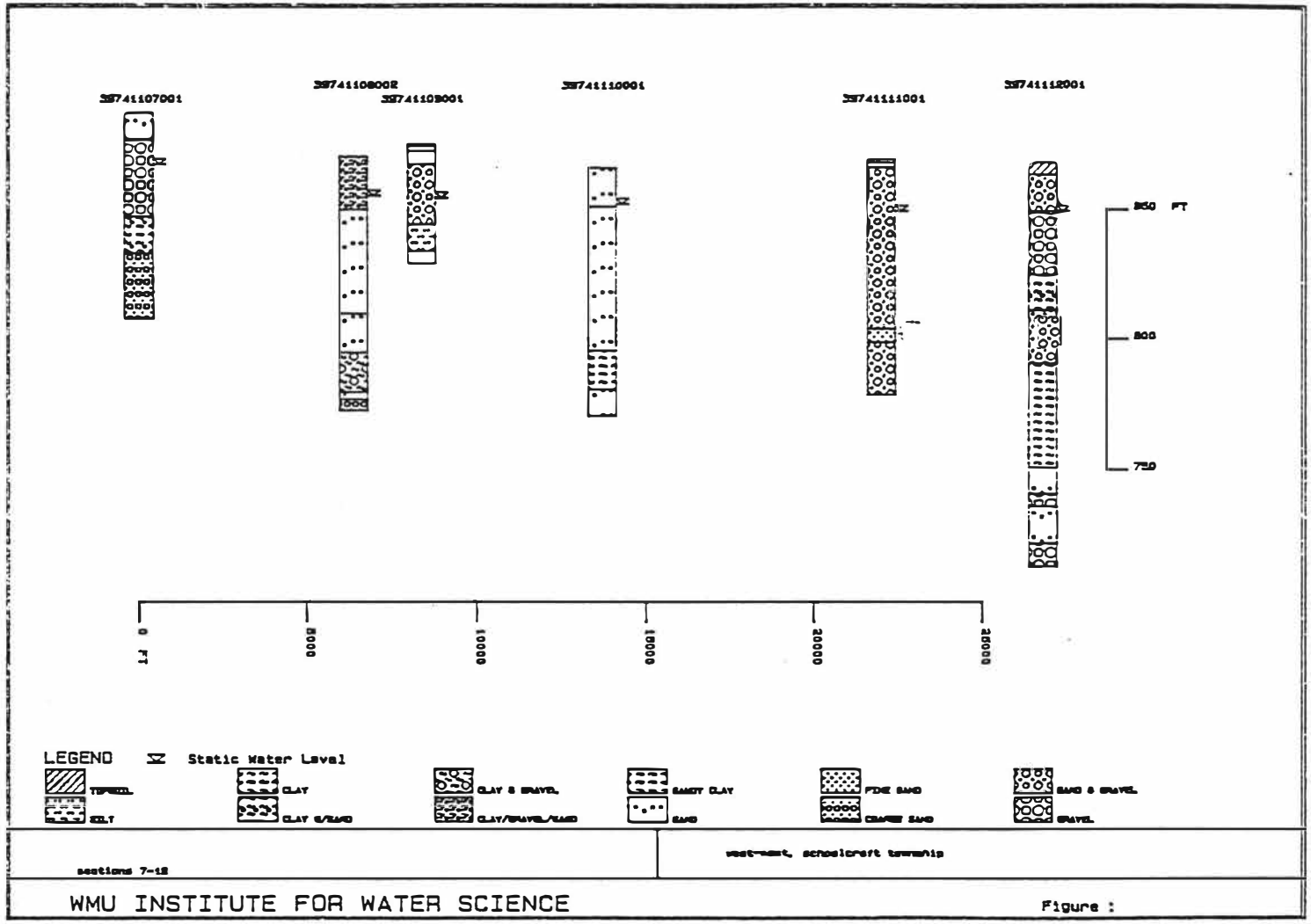


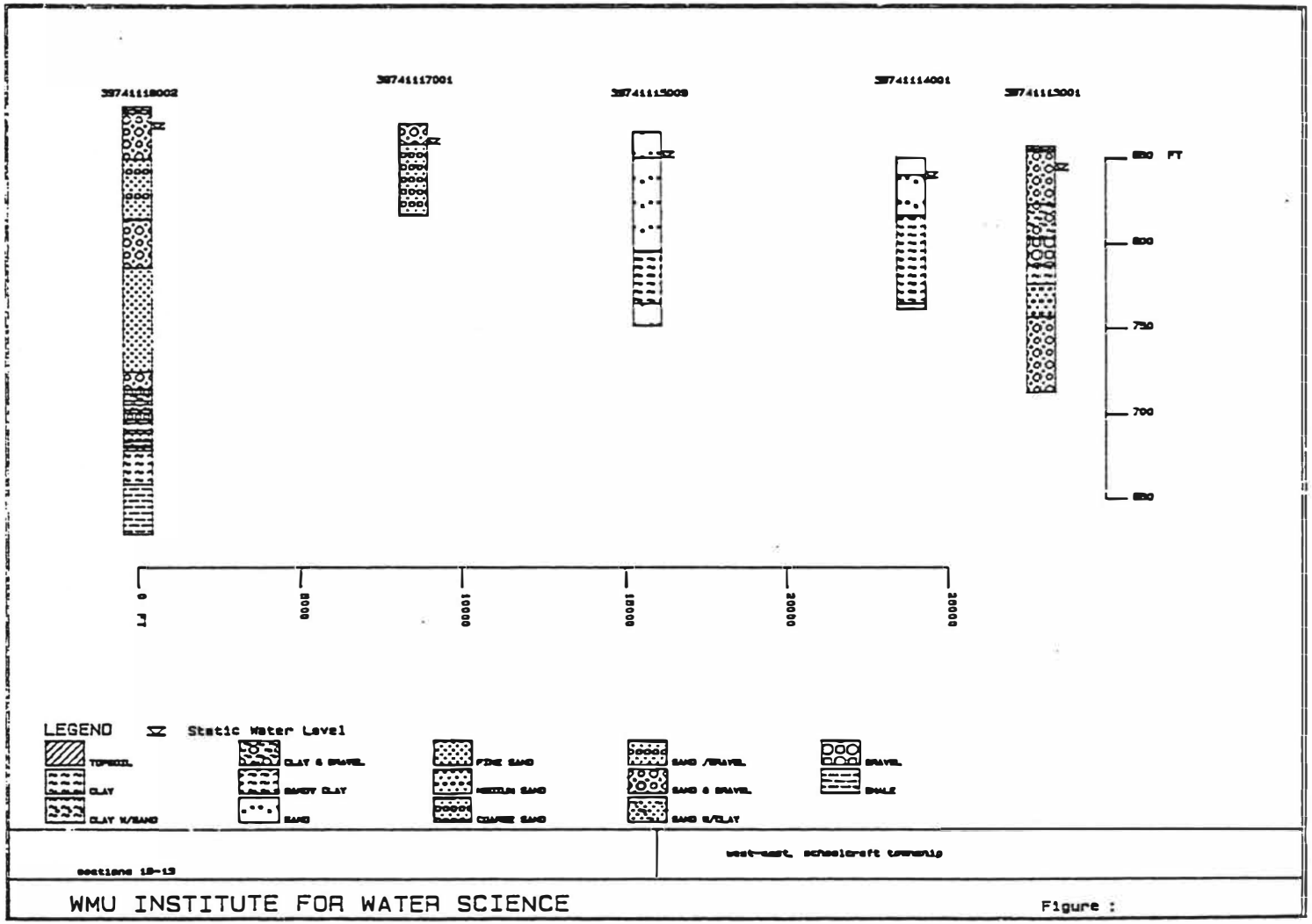
Figure : 43(sic)

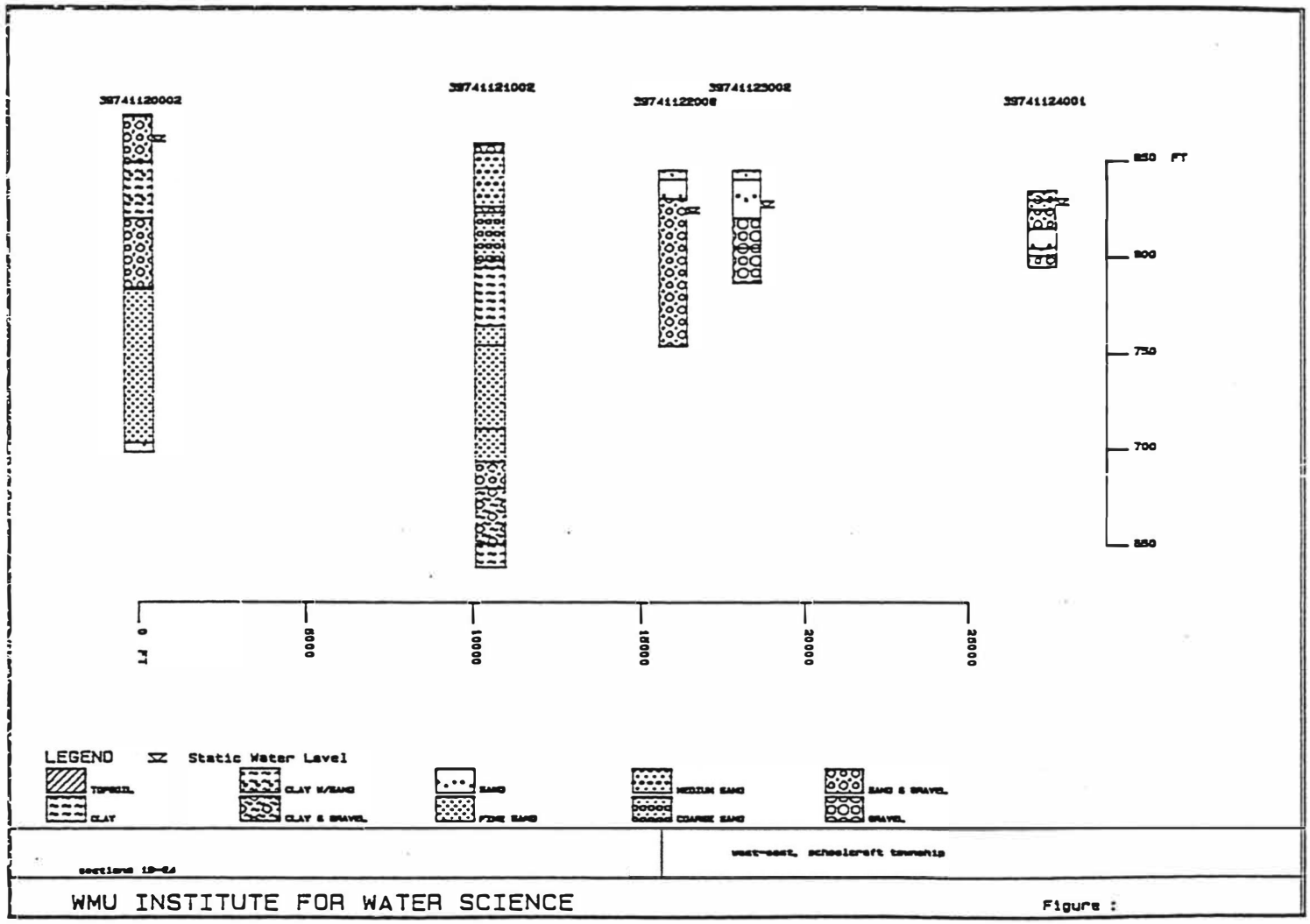
LEGEND
Static Water Level
CLAY
CLAY & GRAVEL
SAND
SAND & GRAVEL
GRAVEL W/CLAY
CLAY W/SAND
CLAY/GRAVEL/SAND
FINE SAND
GRAVEL
UNKNOWN
WMU INSTITUTE FOR WATER SCIENCE
Figure : 529nscl

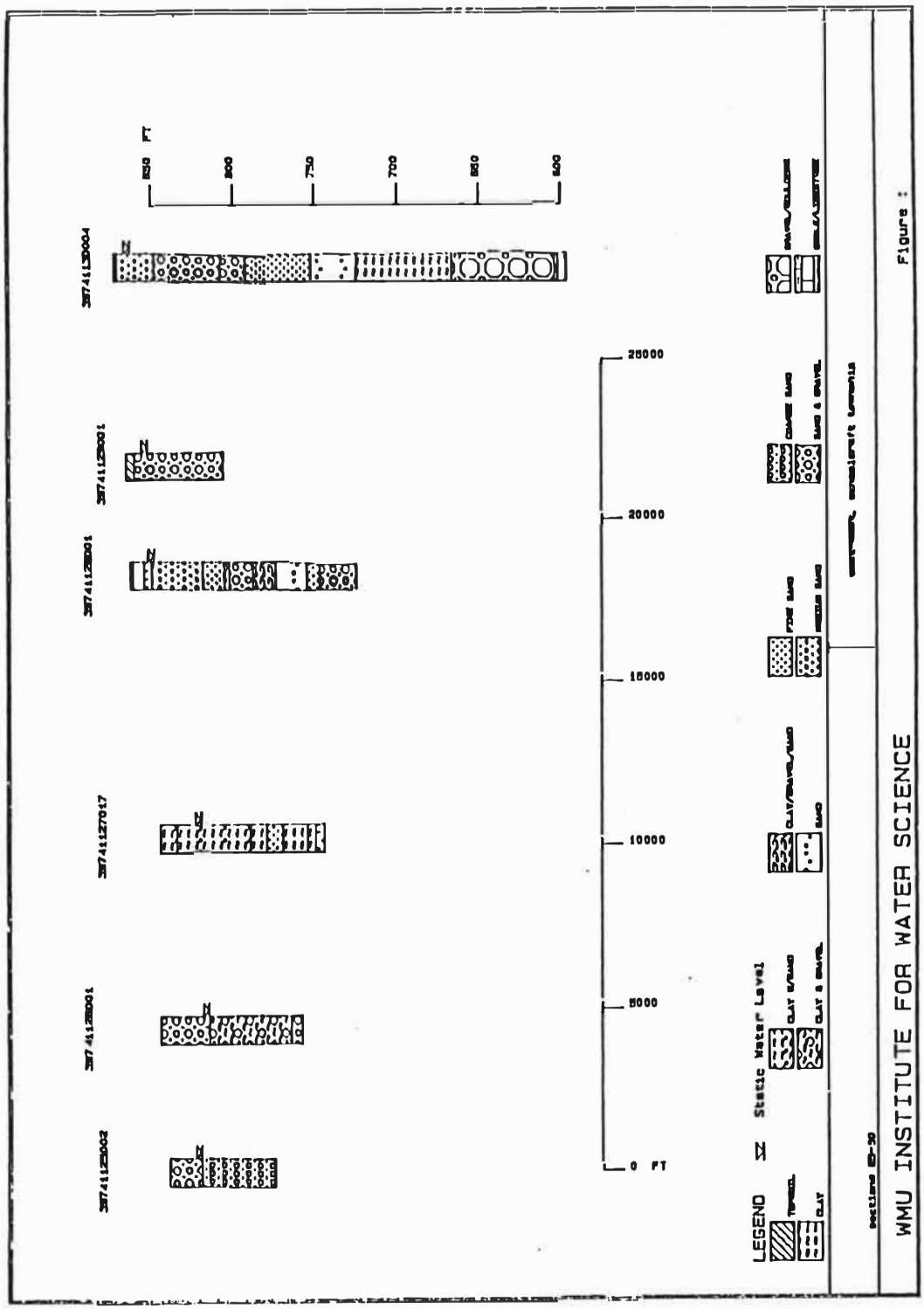
Figure : 83insc1

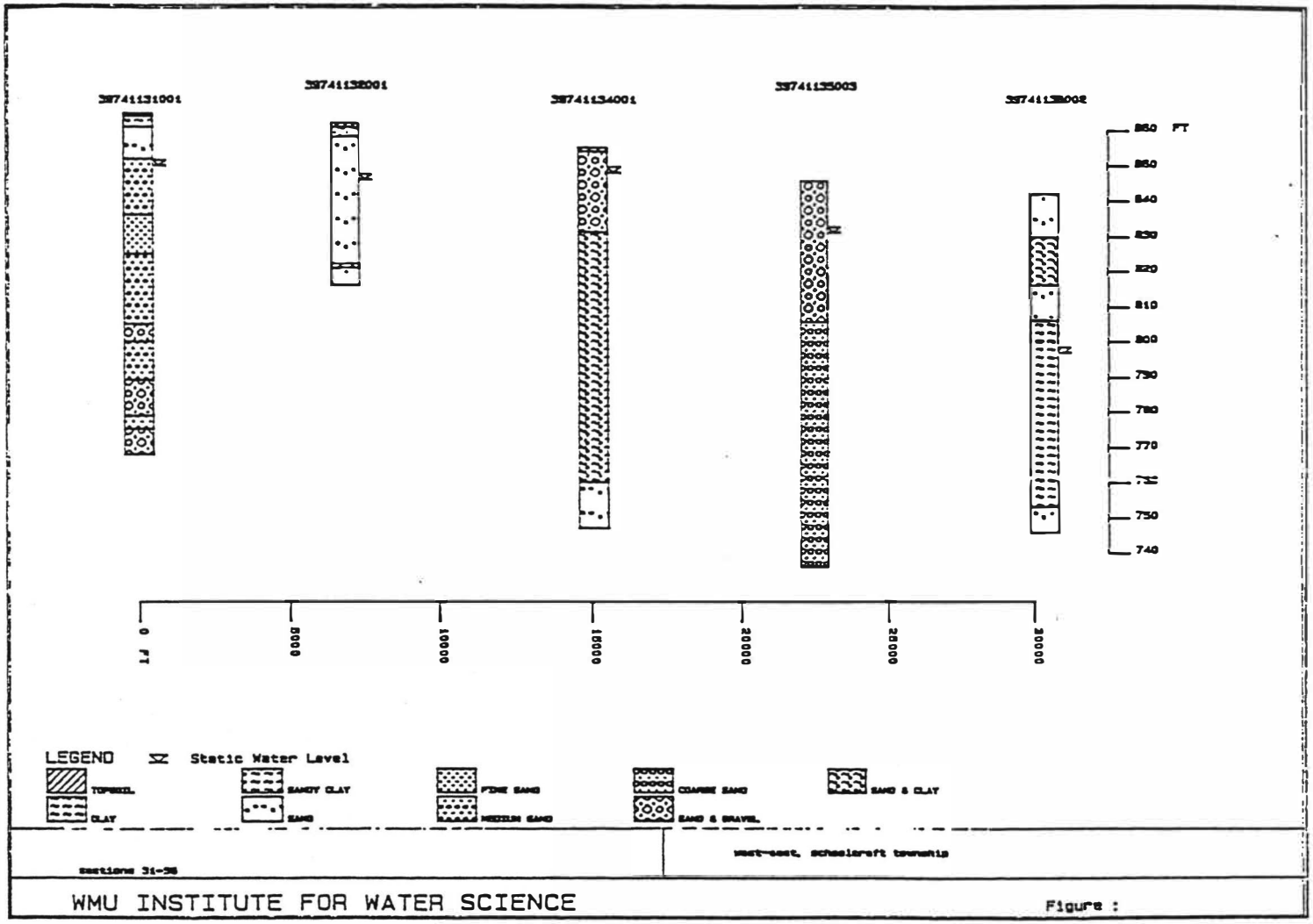

397411106002
397411105019
397411103017
397411102004
397411101005
850 FT
800
750
700
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
TOPSOIL
CLAY
CLAY W/SAND
CLAY & GRAVEL
CLAY/GRAVEL/SAND
SAND
FINE SAND
COARSE SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
sections B-1
west-east, schoolcraft township
WMU INSTITUTE FOR WATER SCIENCE
Figure :

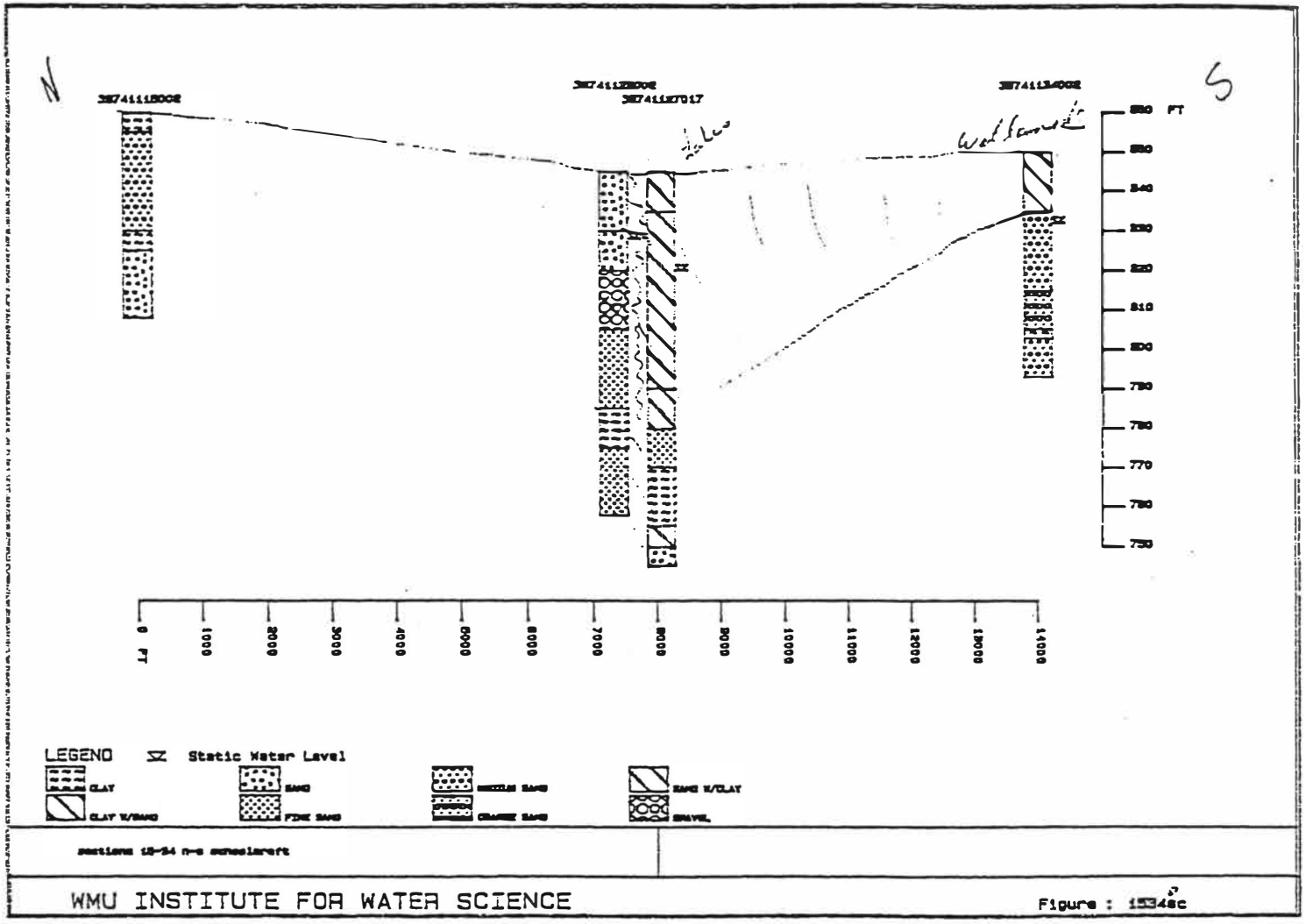

26741107001
26741108002
26741109001
26741110001
26741111001
26741112001
850 FT
800
750
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
TOPSOIL
CLAY
CLAY & GRAVEL
SANDY CLAY
FINE SAND
SAND & GRAVEL
SILT
CLAY & SAND
CLAY/GRAVEL/SAND
SAND
COARSE SAND
GRAVEL
sections 7-18
west-east, schoolcraft township
WMU INSTITUTE FOR WATER SCIENCE
Figure :

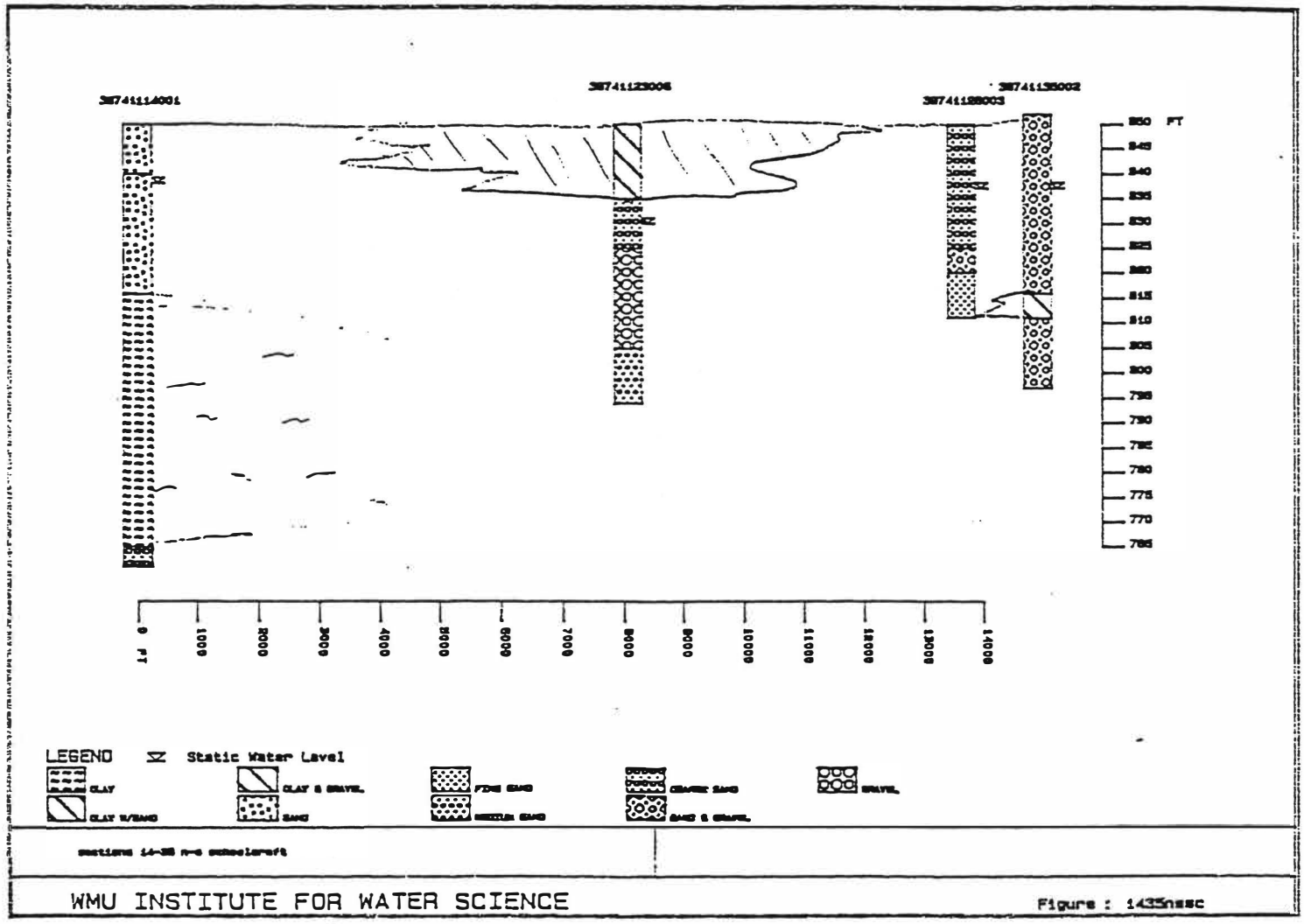

397411118002
397411117001
397411115009
397411114001
397411113001
SWL
850 FT
800
750
700
650
0 FT
5000
10000
15000
20000
LEGEND
Static Water Level
TOPSOIL
CLAY
CLAY W/SAND
CLAY & GRAVEL
SANDY CLAY
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND /GRAVEL
SAND & GRAVEL
SAND W/CLAY
GRAVEL
SHALE
sections 12-13
west-east, schoolcraft township
WMU INSTITUTE FOR WATER SCIENCE
Figure :


39741120002
39741121002
39741122002
39741123002
39741124001
850 FT
800
750
700
650
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
TOPSOIL
CLAY
CLAY W/SAND
CLAY & GRAVEL
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND & GRAVEL
GRAVEL
sections 19-24
west-east, schoolcraft township
WMU INSTITUTE FOR WATER SCIENCE
Figure :


WMU INSTITUTE FOR WATER SCIENCE
LEGEND
Static Water Level
CLAY
CLAY & GRAVEL
CLAY/GRAVEL/SAND
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND & GRAVEL
BEDROCK
0 FT
5000
10000
15000
20000
25000
FT
850
800
750
700
650
600
3741130004
3741128001
3741127017
3741128002


397411310O1
397411380O1
397411340O1
397411350O3
397411380O2
SWL
860 FT
850
840
830
820
810
800
790
780
770
760
750
740
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
TOPSOIL
CLAY
SANDY CLAY
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND & GRAVEL
SAND & CLAY
sections 31-36
west-east, Schoolcraft township
WMU INSTITUTE FOR WATER SCIENCE
Figure :


N
S
FT
LEGEND
Static Water Level
CLAY
CLAY W/SAND
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND W/CLAY
GRAVEL
WMU INSTITUTE FOR WATER SCIENCE



WMU INSTITUTE FOR WATER SCIENCE

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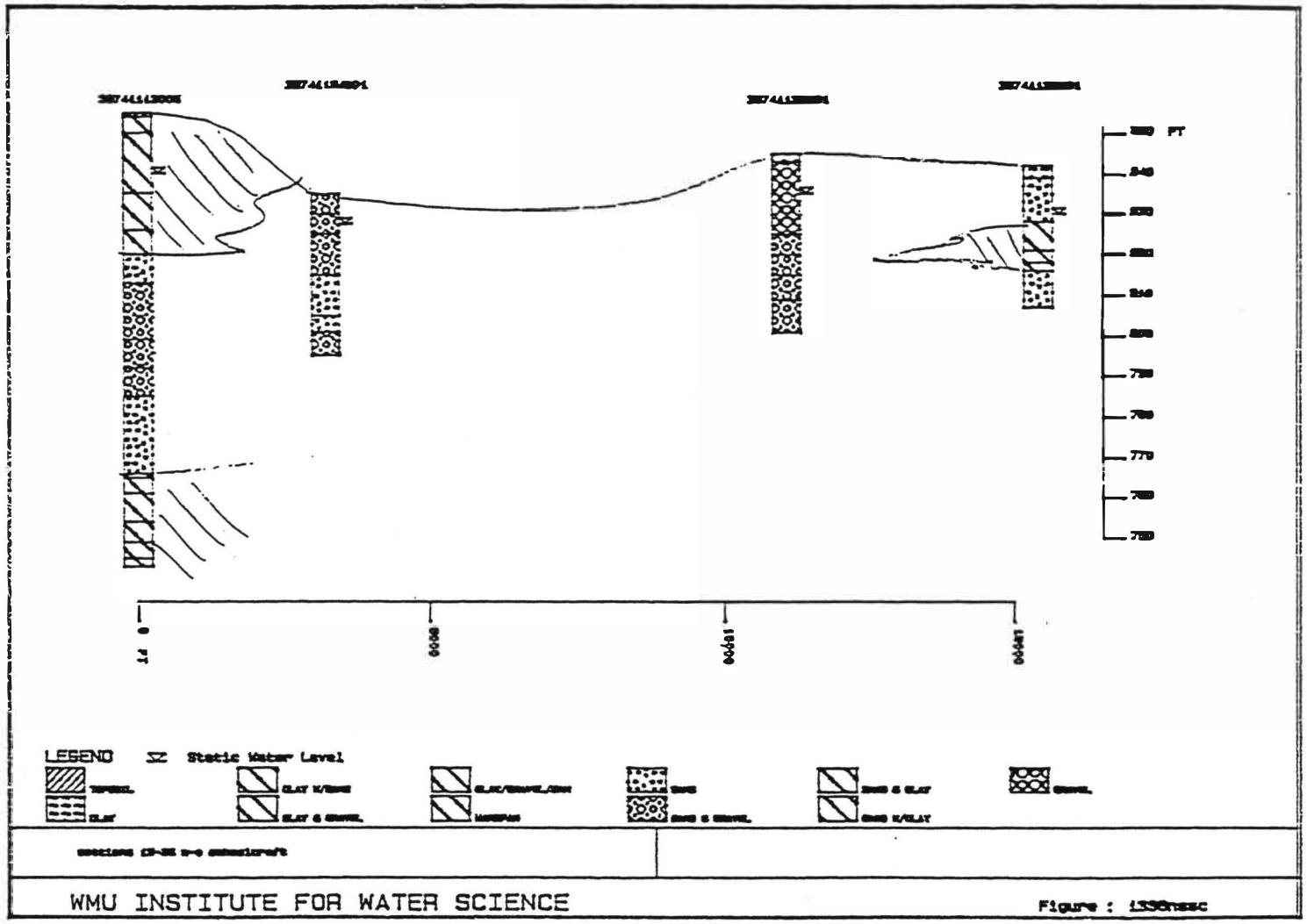

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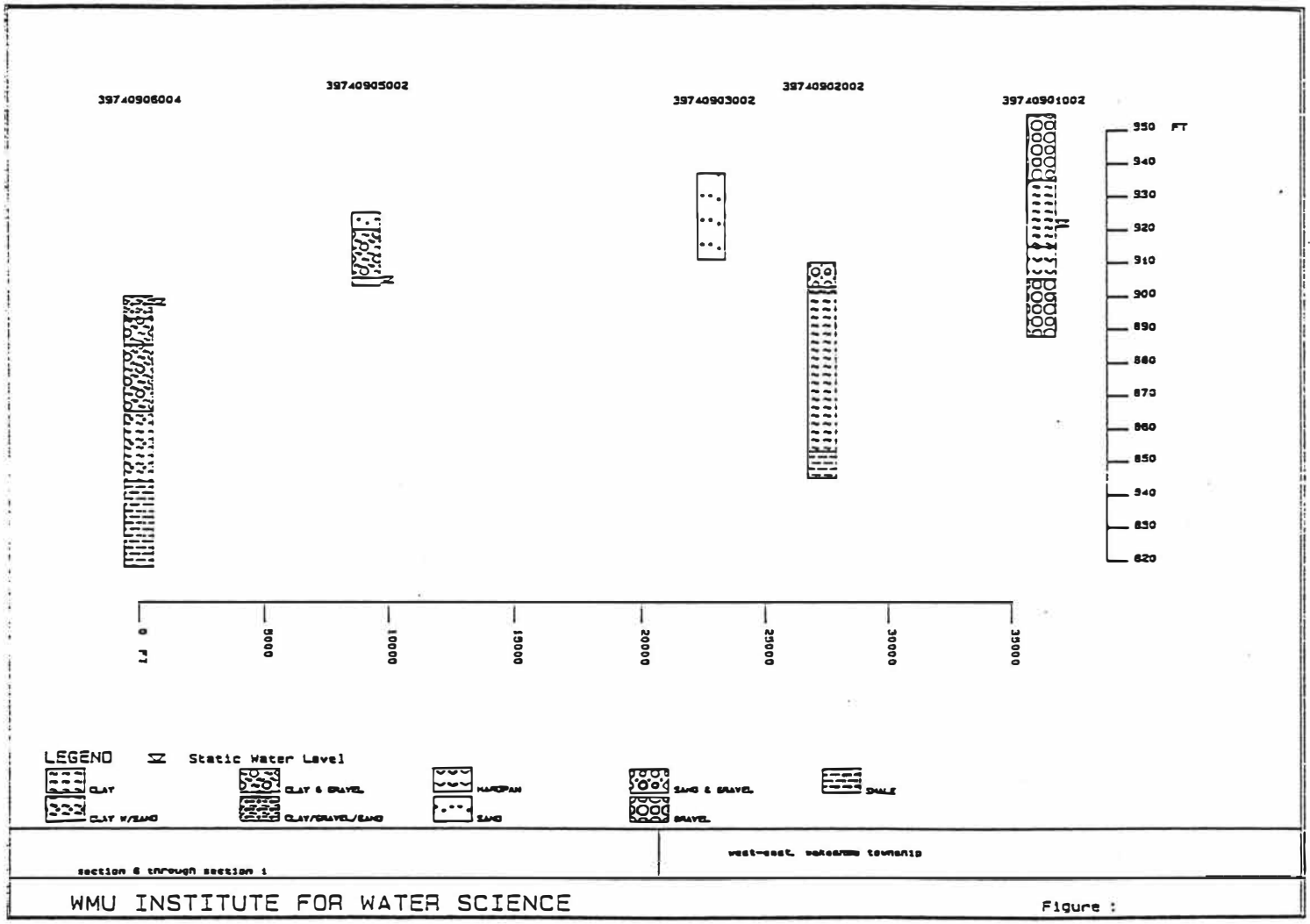
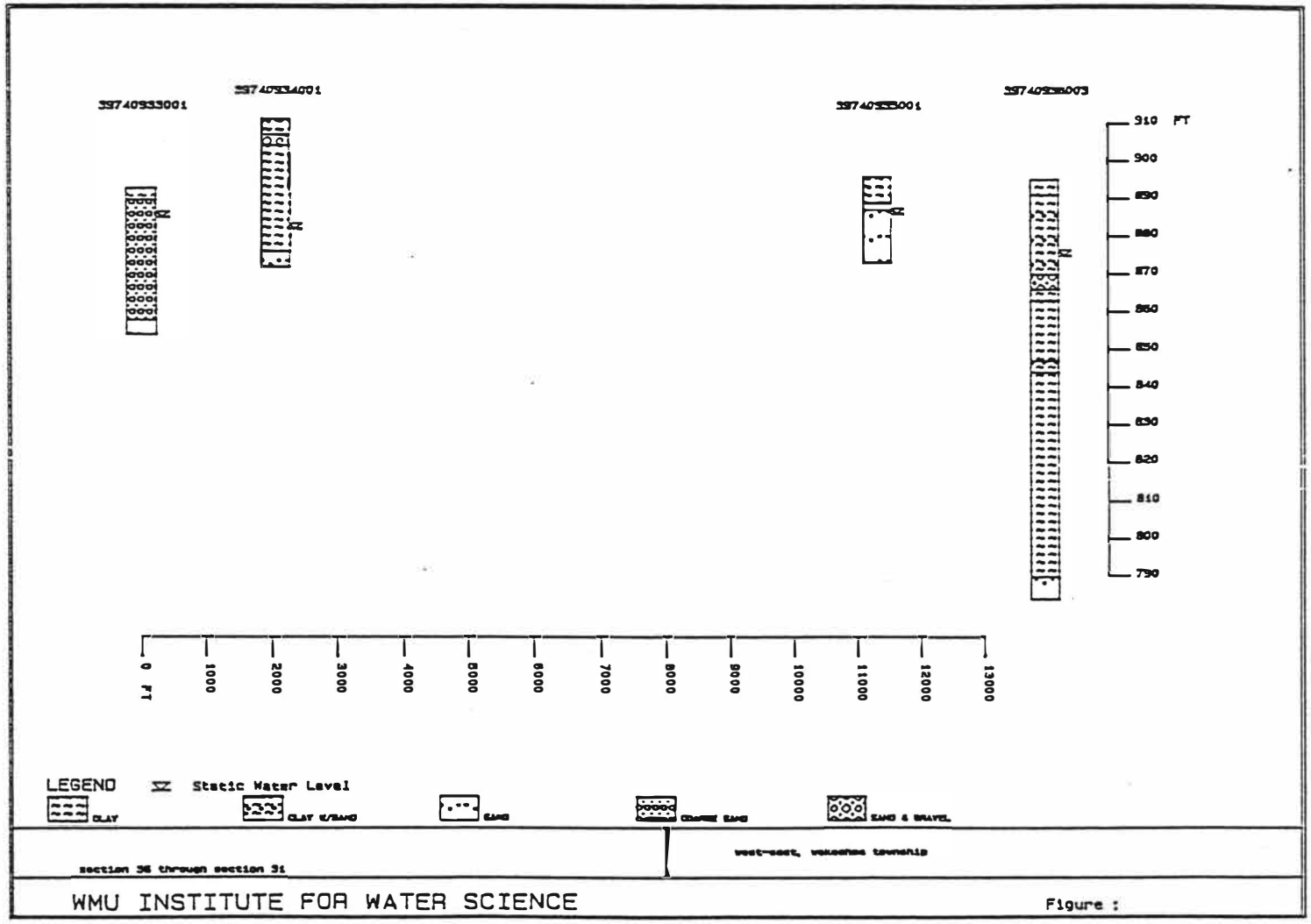
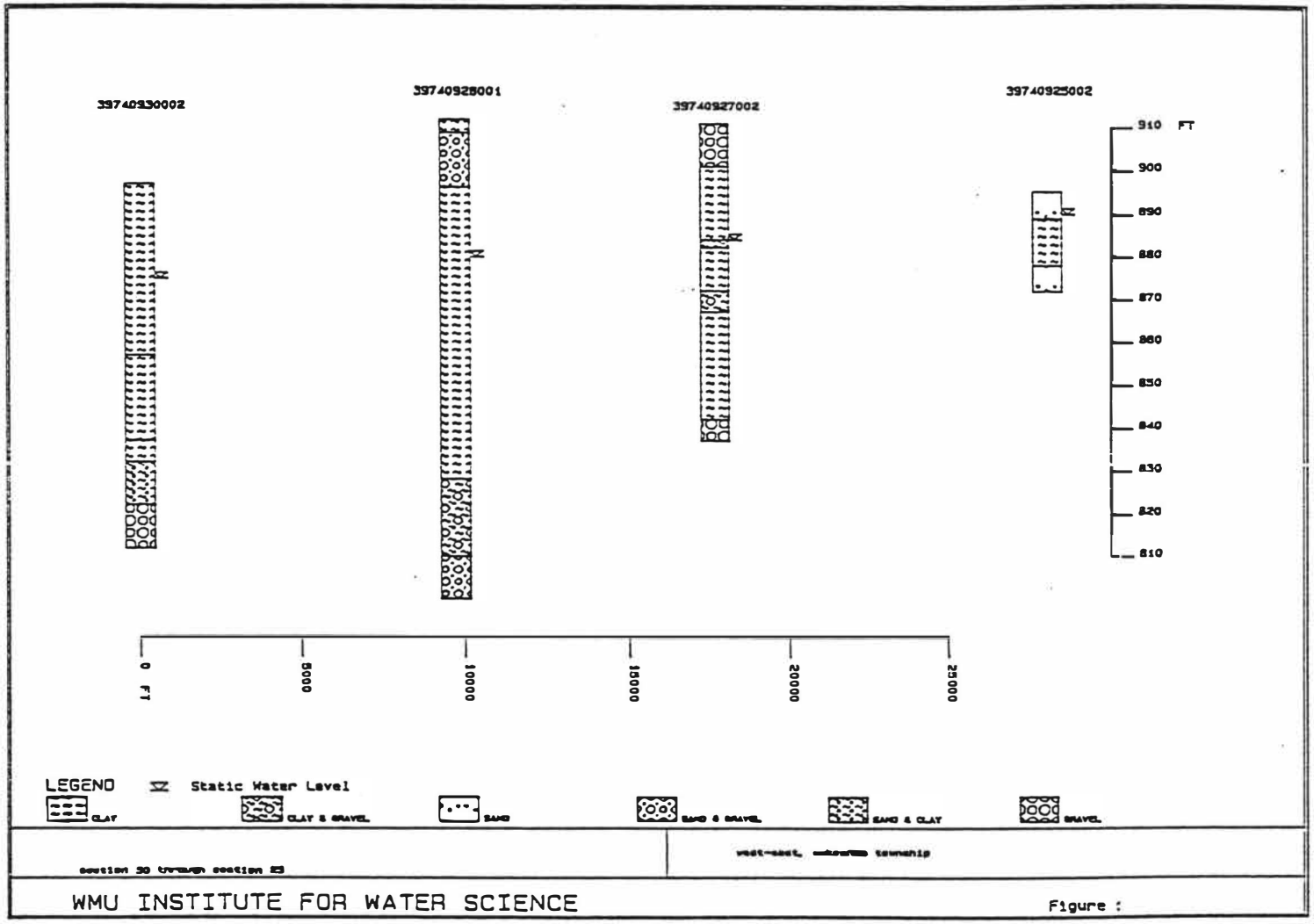
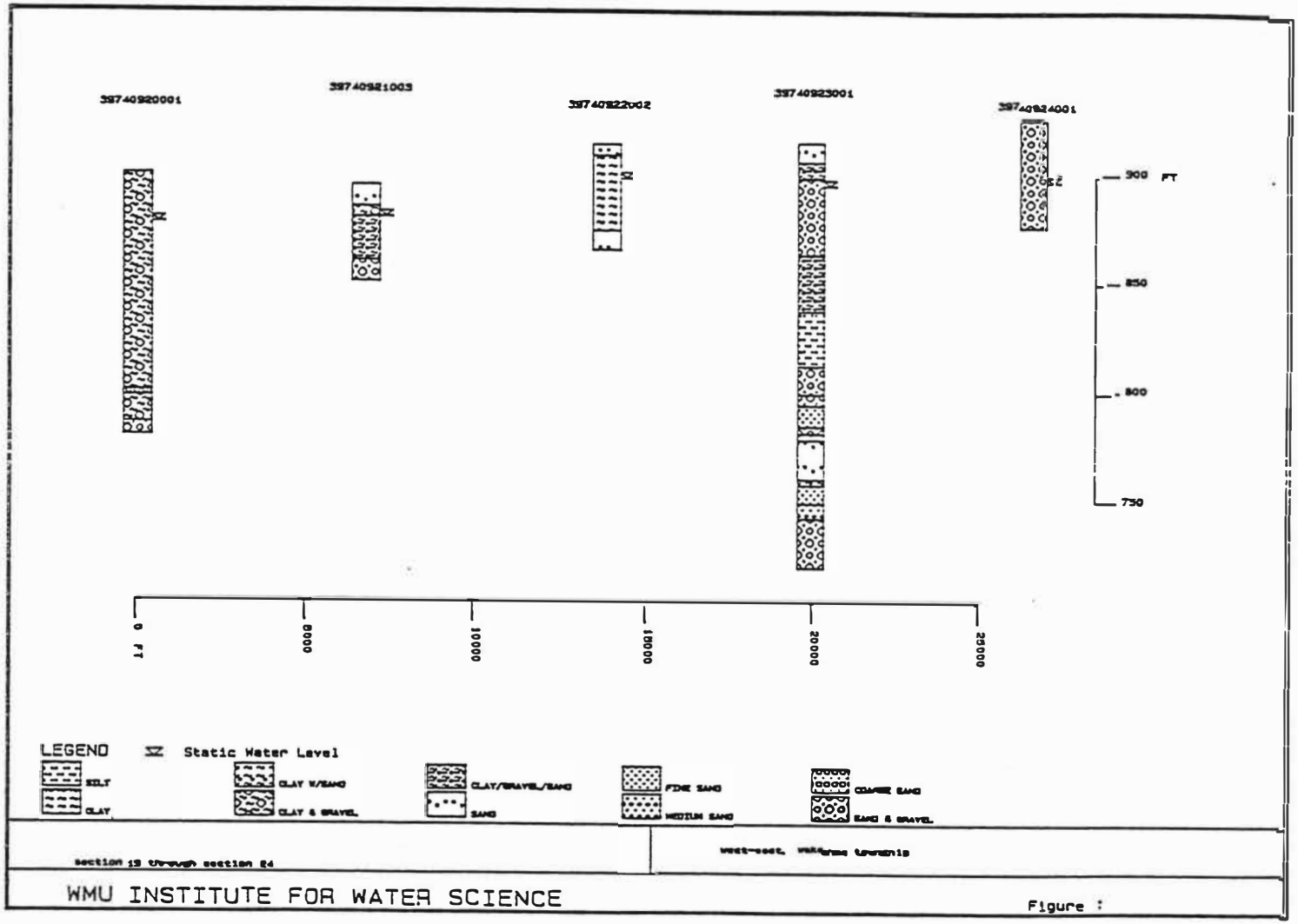
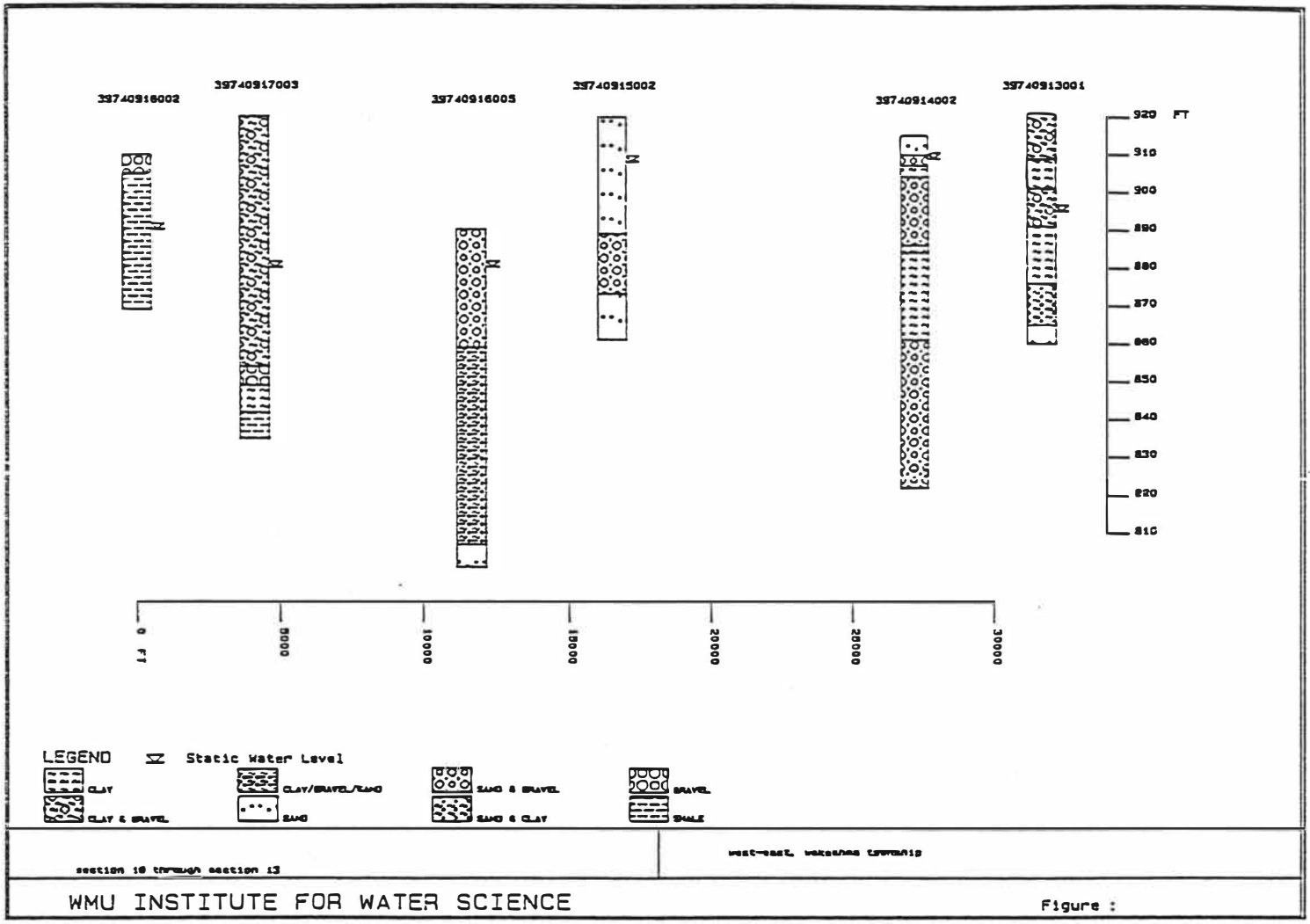
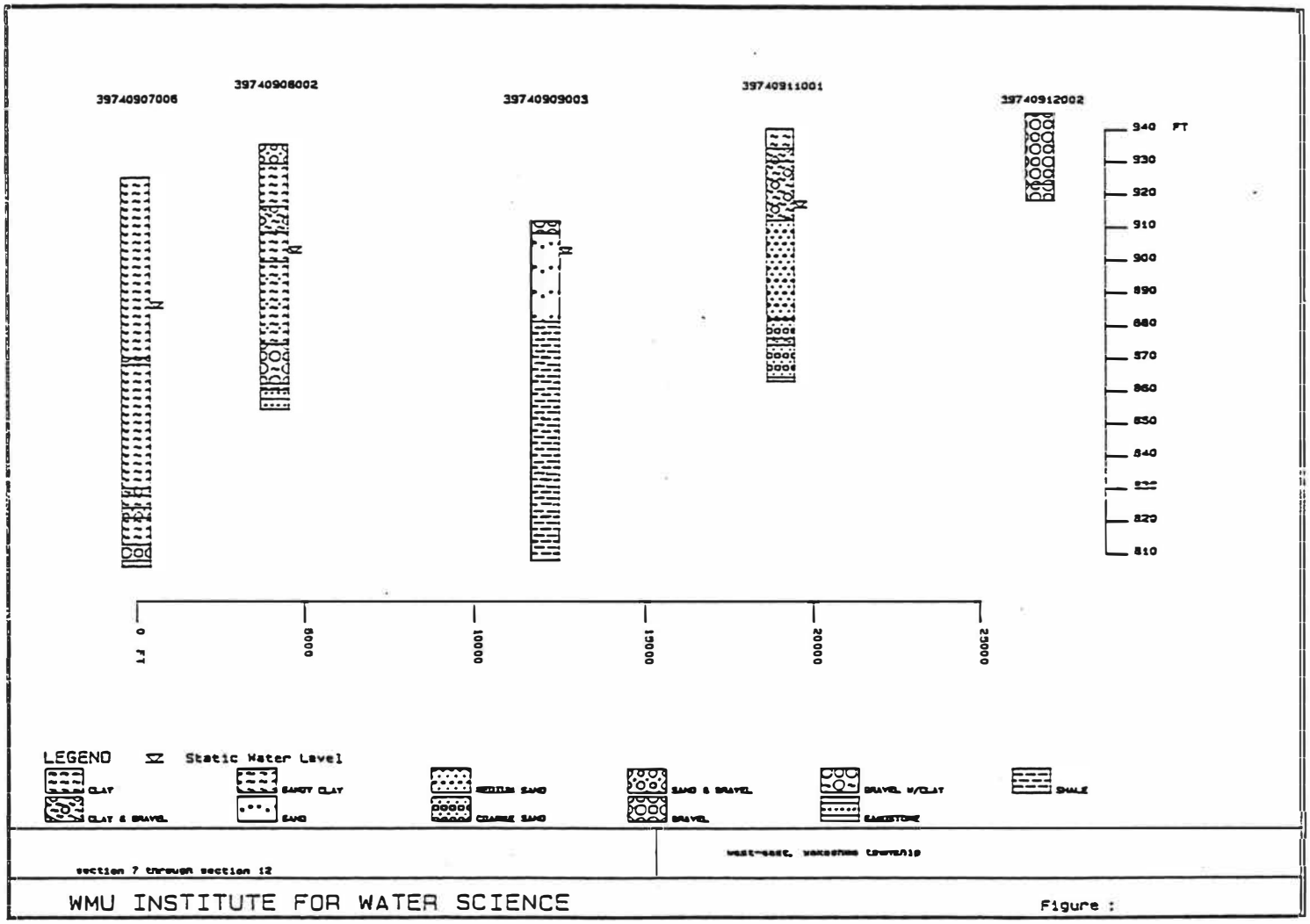

39740906004
39740905002
39740903002
39740902002
39740901002
950 FT
940
930
920
910
900
890
880
870
860
850
840
830
820
0 FT
5000
10000
15000
20000
25000
30000
35000
LEGEND
Static Water Level
CLAY
CLAY W/SAND
CLAY & GRAVEL
CLAY/GRAVEL/SAND
HARDPAN
SAND
SAND & GRAVEL
GRAVEL
SHALE
section 6 through section 1
west-east, oakdale township
WMU INSTITUTE FOR WATER SCIENCE
Figure :


397409330001
397409340001
397409350001
397409360003
910 FT
900
890
880
870
860
850
840
830
820
810
800
790
0 FT
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
12000
13000
LEGEND
Static Water Level
CLAY
CLAY & SAND
SAND
COARSE SAND
SAND & GRAVEL
section 36 through section 31
west-east, wakeshma township
WMU INSTITUTE FOR WATER SCIENCE
Figure :


39740930002
39740928001
39740927002
39740925002
910 FT
900
890
880
870
860
850
840
830
820
810
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
CLAY
CLAY & GRAVEL
SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
WMU INSTITUTE FOR WATER SCIENCE
Figure :


397409200001
397409210003
397409220002
397409230001
397409240001
300 FT
850
800
750
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
SILT
CLAY
CLAY W/SAND
CLAY & GRAVEL
CLAY/GRAVEL/SAND
SAND
FINE SAND
MEDIUM SAND
COARSE SAND
SAND & GRAVEL
section 13 through section 24
WMU INSTITUTE FOR WATER SCIENCE
Figure :


39740916002
39740917003
39740916005
39740915002
39740914002
39740913001
920 FT
910
900
890
880
870
860
850
840
830
820
810
0 FT
5000
10000
15000
20000
25000
30000
LEGEND
Static Water Level
CLAY
CLAY & GRAVEL
CLAY/GRAVEL/SAND
SAND
SAND & GRAVEL
SAND & CLAY
GRAVEL
SHALE
section 10 through section 13
west-east, Watseka township
WMU INSTITUTE FOR WATER SCIENCE
Figure :


39740907006
39740908002
39740909003
39740911001
39740912002
940 FT
930
920
910
900
890
880
870
860
850
840
830
820
810
0 FT
5000
10000
15000
20000
25000
LEGEND
Static Water Level
CLAY
CLAY & GRAVEL
SANDY CLAY
SAND
MEDIUM SAND
COARSE SAND
SAND & GRAVEL
GRAVEL
GRAVEL W/CLAY
SANDSTONE
SHALE
section 7 through section 12
west-east, kalamazoo township
WMU INSTITUTE FOR WATER SCIENCE
Figure :

Appendix B

Water Well Records

WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 2972012002 | A1 | Tax Parcel #

County	Township Name	Direction	Section	Town	Range
KALAMAZOO	OSHTEMO	NE 1/4 SW 1/4 NE 1/4	29	02 S	12 W

Distance And Direction From Road Intersection
65 ' W. OF 4TH ST. & 1.5 [illegible] N. OF W. MAIN.
544 S. 4TH ST. ALEXANDER, OSHTEMO
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 781.00 msl

2 OWNER OF WELL: WILKINS AND WHEATON
Address: 171 [illegible]
KALAMAZOO, MI 49001
Address Same As Well Location: [ ] Yes [x] No

3 WELL DEPTH: 465.0 FT. | Date Completed: 02/04/80 | [ ] New [ ] Replacement Well

5 [ ] Cable Tool [x] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE: [x] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Test Pump
[ ] Test Well [ ] Type III Public [ ]

7 CASING: [ ] Steel [x] Threaded
[ ] Plastic [x] Welded
Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 375.0 ft. depth
3.00 in. to 165.0 ft. depth
Weight lbs/ft.
Grouted Pull Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 3.00
Make 19.000 Length 4.0
Slot between 417.00 ft. and 421.00 ft.
FITTINGS: [x] Packer [ ] Bead Packer [ ] Drawdown Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
104.50 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
192 ft. after 12.0 hrs. pumping at 10 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL YIELD
CONSTRUCTION: [ ] Jetted [x] Drilled [ ] Dug [ ] Bored
[ ] Driven [ ] Crib [ ] Other

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH to BOTTOM OF STRATUM
SAND AND GRAVEL	42	42
BROWN CLAY AND GRAVEL	8	50
GRAY CLAY AND GRAVEL	17	68
SAND AND GRAVEL WITH CLAY SEAMS	81	149
GRAVEL AND STONES	55	204
GRAY CLAY AND GRAVEL STRIPS	26	230
STONES AND GRAY CLAY	22	252
GRAY CLAY	11	263
GRAY CLAY AND GRAVEL	31	294
SAND, GRAVEL AND GRAY CLAY	9	303
GRAY CLAY AND GRAVEL	121	424
GRAVEL	6	430

12 WELL GROUTED? [ ] No [ ] Yes From 0 ft. to 0 ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of Bags of cement ___ Additives ___

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [x] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Pump Pipe 0 ft. Capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity 0 Gallons

15. Remarks, elevation, source of data, etc.
WELL IS ALEXANDER'S 1ST SERVICE

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

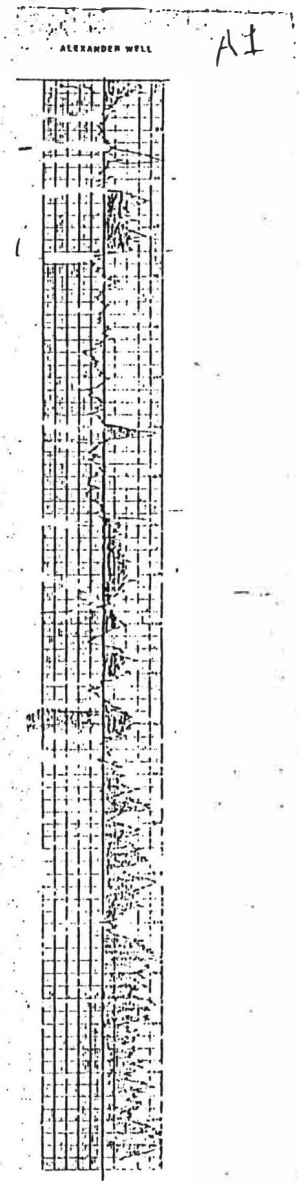
16. WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

532
REGISTERED BUSINESS NAME REGISTRATION NO.

Name

Signature Date
AUTHORIZED REPRESENTATIVE

This is an MDNR computer generated facsimile of a water well record submitted under PA 368 of 1978.
This is not a legal document.


ALEXANDER WELL
A1

WATER WELL AND PUMP RECORD

Type Print

LOCATION OF WELL 39021130400 | A2 | To Excel

County: KALAMAZOO | Township Name: KALAMAZOO | Fraction: SW 1/4 NW 1/4 SW 1/4 | Section: 09 | Town: 02 S | Range: 11 W

Distance And Direction From Road Intersection
09 S. SIDE OF DRAKE RD. 200 YDS. S. OF DRAKE LT.
DRAKE RD, KALAMAZOO
Street Address & City of Well Location

Locate with 'X' in Section Below | Sketch Map

ELEVATION 910.00 msl

1 OWNER OF WELL: WESTERN MICHIGAN UNIVERSITY
Address: GEOLOGY DEPT
KALAMAZOO, MI 49008
Address Same As Well Location? | | Yes [x] No

4 WELL DEPTH: 270.0 FT. | Date Completed: 07/12/91 | [x] New Well | | Replacement Well

5 | | Cable Tool [x] Rotary | | Driven | | Dug
| | Bellow ed | | Auger/Bored | | Jetted

6 USE | Domestic | Type | Public | Type III Public
| Irrigation | Type II Public | Heat Pump
[x]Test Well | Type IV Public | |

7 CASING: | | Steel | | Threaded | Weight: Above Surface 1.0 ft.
[x] Plastic [x] Welded
Diameter
5.00 in. to 270.0 ft. Depth
0.00 in. to 0.0 ft. Depth
Grouted? Wall Hole Diameter
8.00 in. to 270.0 ft. Depth
0.00 in. to 0.0 ft. Depth
Weight __ lbs/ft.
Drive Shoe [x] Yes | | No

8 SCREEN | | N.A. Installed
Type Plastic/PVC Diameter 5.00
Slot 0.015 Length 15.0
Set between 225.00 ft. and 240.00 ft.
FITTINGS: | K-Packer | Bead Packer | Bottom Check
| | Blank pipe from 0.0 ft. Other

9 STATIC WATER LEVEL:
62.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
150 ft. after 0.0 hrs. pumping at 40 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: | |Pitless adapter | [x]12" above grade
| |Basement well | |Approved pit

12 WELL GROUTED? | |No | Yes From To ft.
| |Neat cement | [x]Bentonite | Other
No. of Bags of cement Additives

14 Nearest source of possible contamination
Type Other Distance 500 ft. Direction
Well disinfected upon completion? | |Yes |x|No
Was old well plugged? | |Yes |x|No

14 PUMP: [x]Not Installed | |Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 Ft. Capacity 0 G.P.M.
TYPE: | |Submersible | |Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

#	FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
	CLAY	1	1
	SAND & GRAVEL	116	117
	SILT, SAND ,CLAY	49	166
	GRAVEL & SAND	12	178
	CLAY & SAND	14	192
	SAND	10	202
	CLAY & SAND	12	214
	CLAY & PEAT	7	221
	COARSE SAND	14	241
	CLAY & SAND	11	252
	PENNOCK-COLDWATER SHALE	18	270

15. Remarks, elevation, source of data, etc.
TEST WELL FOR EDUCATIONAL PURPOSES FOR WMU

Data Source: Michigan Groundwater Survey

17. Pig Operator's Name:

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.

1039
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

This is an NOMP computer generated facsimile of a water well record submitted under PA 368 of 1978.
This is not a legal document.


GAMMA-RAY LOG
A2

GEOLOGICAL SURVEY NO 81-16 (First page of two) A3

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
WATER WELL AND PUMP RECORD
Part 127, Act 368, P.A. 1978

PERMIT NUMBER

1 LOCATION OF WELL

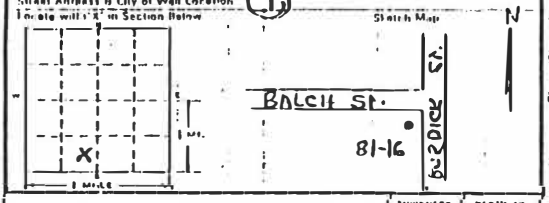
County	Township Name	Fraction	Section Number	Town Number	Range Number
KALAMAZOO	KALAMAZOO	E ½ SE ¼ SW ¼	22	2 S N/S	11 W E/W

Distance And Direction From Road Intersection
16 02S. Durdick St. 1 5.5'West of Durdick St. curb and 1 9ft. South of Balch St.

Street Address & City of Well Location (1)

Locate with "X" in Section Below

Sketch Map



2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Concrete		
Sand, gravel and clay	3	3
Muck and clay	6	9
Marl and clay	3	12
Grabel, sand and caly	4	16
Sand, gravel and clay	5	21
Sand, gravel and clay	7	(20)
Clay and fine sand	16	36
Sand, little gravel and clay	4	40
Gravel, sand and clay	5	45
Gravel, sand and clay	5	50
Gravel, sand and clay	4	(54)
Sand, gravel and clay	5	59
Sand, gravel and clay	5	64
Sand, gravel and clay	5	69
Sand, gravel and clay	5	(74)
Gravel, sand and clay	5	79
Gravel, sand and clay	5	(84)
Gravel, sand and clay (muddy)	5	89
Gravel, sand and clay (muddy)	5	94
Gravel, sand and clay (muddy)	5	99
Gravel, sand and clay (muddy)	5	104
Gravel, sand and clay (muddy)	5	109
Gravel, sand and clay (muddy)	5	114
Gravel, sand and clay (muddy)	5	(119)
Gravel, sand and clay	5	124
Gravel sand and clay	5	129
Gravel, sand and clay		(133)
Fine sand and clay	4	137
Fine sand and clay	5	142
Fine sand and clay	5	147

USE A 2ND SHEET IF NEEDED

15. Remarks, elevation, source of data, etc.
(cont. on page 2)
Used one pail of jell pellets at 6 2-6 9ft. level.
Used 2 bags of redy cement mixxx at surface

3 OWNER OF WELL
CITY OF KALAMAZOO
Address 414 Stockbridge Ave.
Michigan 49001
Address Same As Well Location? [ ] Yes [X] No

4 WELL DEPTH (completed) 62 ft | Date of Completion: June 24, 1981

5 [X] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger [ ] Jetted [ ]

6 USE [ ] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Test pump
[X] Test Well [ ] Type IV Public [ ]

7 CASING Diameter [X] Steel [X] Threaded [ ] Welded [ ] Plastic
1¼ in. to 59 ft. depth
___ in. to ___ ft. depth
Grouted? Yes No Unknown
___ in. to ___ ft. depth
___ in. to ___ ft. depth
Height Above/Below Surface 1 ft
Weight ___ lbs/ft
Drive Shoe [ ] Yes [ ] No

8 SCREEN [ ] Not Installed
Type 53 Diameter 1¼"
Slot/Gauge 100 Length 3'
Set Between 59 ft and 62 ft
FILTERS [ ] K Packer [ ] Lead Packer [ ] Gravel Placed
[ ] Rise above screen ___ ft ___ Other ___

9 STATIC WATER LEVEL
11 ft. below land surface [ ] Flow

10 PUMPING LEVEL below land surface
___ ft. after ___ hrs. pumping at ___ GPM
___ ft. after ___ hrs. pumping at ___ GPM

11 WELL HEAD COMPLETION [ ] Pitless adapter [ ] 12" above grade
[ ] Basement slab [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From ___ to ___ ft
[ ] Neat cement [ ] Bent mix [ ] Other ___
No. of bags of cement ___ Additives ___

13 Nearest source of possible contamination
Type ___ Distance ___ ft. Direction ___
Well disinfected upon completion? [ ] Yes [ ] No

14 PUMP [ ] Not installed [ ] For observation Only
Manufacturer's name ___
Model Number ___ HP ___ Volts ___
Length of Drop Pipe ___ ft. Capacity ___ GPM
TYPE [ ] Submersible [ ] Jet ___
PRESSURE TANK
Manufacturer's name ___
Model number ___ Capacity ___ Gallons

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
CITY OF KALAMAZOO 071 2
REGISTERED BUSINESS NAME REGISTRATION NO
Address 415 Stockbridge Ave. MI 49001
Signed ___ Date 8/4/82
Authorized Representative

of Balch St.

N

WELL DEPTH (completed) 62 ft

June 69

Driven

Jetted

Dug

Bored

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

GEOLOGICAL SURVEY NO 81-16

WATER WELL AND PUMP RECORD

PERMIT NUMBER

PART 127 ACT 368 P A 1978

A3

(second page)

1 LOCATION OF WELL

County	Township Name	Fraction 1/4 1/4 1/4	Section Number	Town Number N/S	Range Number E/W

Distance And Direction From Road Intersection (1)

Street Address & City of Well Location

Indicate with "X" in Section below — Sketch Map

1 mile

1 mile

3 OWNER OF WELL

Address

Address Same As Well Location? ☐ Yes ☐ No

4 WELL DEPTH (completed) ft — Date of Completion

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hydraulic rotary ☐ Auger ☐ Jetted ☐

6 USE ☐ Domestic ☐ Type I Public ☐ Type III Public ☐ Irrigation ☐ Type IIa Public ☐ Heat pump ☐ Test Well ☐ Type IIb Public ☐

7 CASING Diameter ☐ Steel ☐ Threaded ☐ Plastic ☐ Welded — Height Above/Below Surface ____ ft — Weight ____ lbs/ft

____ in. to ____ ft. depth

____ in. to ____ ft. depth

Greatest Drill Hole Diameter

____ in. to ____ ft. depth

____ in. to ____ ft. depth

Drive Shoe ☐ Yes ☐ No

8 SCREEN ☐ Not Installed

Type ____ Diameter ____

Slot/Gauze ____ Length ____

Set between ____ ft. and ____ ft.

FITTINGS. ☐ K Packer ☐ Lead Packer ☐ Bronner Check ☐ Above screen ____ ft Other ____

9 STATIC WATER LEVEL

____ ft. below land surface ☐ Flow

10 PUMPING LEVEL (below land surface)

____ ft. after ____ hrs. pumping at ____ GPM

____ ft. after ____ hrs. pumping at ____ GPM

11 WELL HEAD COMPLETION ☐ Pitless adapter ☐ 12" above grade ☐ Basement offset ☐ Approved other

12 WELL GROUTED? ☐ No ☐ Yes From ____ to ____ ft

☐ Neat cement ☐ Bentonite ☐ Other ____

No. of bags of cement ____ Additives ____

13 Nearest source of possible contamination

Type ____ Distance ____ ft. Direction ____

Well disinfected upon completion? ☐ Yes ☐ No

14 PUMP ☐ Not installed ☐ Pump installation only

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Fine sand and clay	5 152	152
Fine sand and xxxx clay	5	157
Fine sand and clay	5	162
Fine sand and clay	5	167
Fine sand and clay	5	172
Fine sand and clay	4	176
Blue clay 10	1	177

WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 39211??? |A4| Tax Parcel

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	KALAMAZOO	SE 1/4 NE 1/4 SW 1/4	16	02 S	11 W

Distance And Direction from Road Intersection
400' E AND 100' N OF INTERS OF DORCHESTER & EMERALD

Street Address & City of Well Location

Locate with 'X' in Section Below   Sketch Map

ELEVATION 850.00 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
CLAY	5	5
GRAVEL, COARSE W/ STONES	18	23
CLAY LAYERS YELLOW AND GRAY	59	82
CLAY, YELLOW AND STICKY	23	105
GRAVEL, RED AND SAND	2	107
CLAY YELLOW AND GRAY WITH SAND STREAKS	18	125
GRAVEL MEDIUM TO COARSE A LITTLE SAND	17	149
CLAY, GRAY SANDY	7	197
GRAVEL, FINE TO MEDIUM W LITTLE CS, SAND BROWN	23	215
GRAVEL MEDIUM	11	226

3 OWNER OF WELL U.S. GEOLOGICAL SURVEY
Address
LANSING, MI
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 226.0 FT. | Date Completed 07/07/?? | [x] New Well [ ] Replacement Well

5 [ ] Cable tool [x] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [ ] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [x] Monitor Well

7 CASING: [ ] Steel [x] Threaded / [ ] Plastic [ ] Welded
Height: Above Surface 1.5 ft.
Diameter
4.00 in. to 216.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.010 Length 10.0
Set between 216.00 ft. and 226.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bronze Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
11.75 ft. below land surface [ ] Flow

10 PUMPING LEVEL below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [ ] Pitless adapter [x] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED: [ ] No [x] Yes From to ft.
[ ] Neat cement [x] Bentonite [ ] Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [x] No
Was old well plugged? [ ] Yes [x] No

14 PUMP: [x] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15 Remarks, elevation, source of data, etc.
CONTINUOUS WATER LEVEL RECORDER INSTALLED 8/7/69

Data Source: MichiganGroundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME   REGISTRATION NO. 198

Address

Signed   Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

Page 1 of 1

LOCATION OF WELL	03710004001	AS	Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	CHARLTON	NE 1/4 NW 1/4 SW 1/4	04	01 S	10 W

Distance And Direction From Road Intersection
.25 MI. W. OF 22TH ST., 100 FT. S. OF 9H AVE.
7200 E. 9H AVE., KALAMAZOO 49001
Street Address & city of Well Location

OWNER OF WELL: LEN STEPPER
Address: 7200 E. 9H AVE.
KALAMAZOO, MI 49001
Address Same As Well Location? [x] Yes [ ] No

Locate with 'X' in Section Below — Sketch Map

ELEVATION: 870.00 msl

1 WELL DEPTH: 59.0 FT. | Date Completed: 10/21/86 | [ ] New Well [ ] Replacement Well

2 [ ] Cable-tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Bollow rod [ ] Auger/Bored [ ] Jetted

3 Use: [x] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IV Public

4 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	24	24
GRAVEL & CLAY	25	49
CLAY	2	51
COARSE SAND	9	60

5 CASING: [x] Steel [ ] Plastic [x] Threaded [ ] Welded
Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 16.0 ft. depth
3.00 in. to 59.0 ft. Depth
Weight lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

6 SCREEN [ ] Not Installed
Type: Stainless Steel Diameter 3.00
Slot 0.010 Length 4.0
Set between 56.00 ft. and 60.00 ft.
Attached: [x] Packer [ ] Bead Packer [ ] Fastener check
[ ] Plug above screen 0.0 ft. Other

7 STATIC WATER LEVEL:
6.00 ft. below land surface [ ] Flow

8 PUMPING LEVEL: below land surface
16 ft. after 0.5 hrs. pumping at 50 G.P.M.
0 ft. after 2.0 hrs. pumping at 0 G.P.M.

9 WELL HEAD
COMPLETION: [x] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

10 Well Grouted? [ ] No [ ] Yes From 0 ft. To 0 ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of Bags of cement Additives

11 Nearest source of possible contamination
Type: Septic Distance 50 Ft. Direction S
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

12 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name: BOWES
Model number HP .5 Volts
Length of Drop Pipe 32 Ft. Capacity 0 G.P.M.
TYPE: [x] Submersible [ ] Jet
WELL SEAL:
Manufacturer's name
Model number Capacity 0 Gallons

15. Permit, elevation, source of data, etc.
SAMPLE 4-20-87

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

16. WATER WELL CONTRACTOR'S CERTIFICATE:
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

Signed — Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

Page 1 of 1

LOCATION OF WELL	Tax Parcel
3021100300I	AG

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PAVILION	SW 1/4 SE 1/4 SW 1/4	03	03 S	10 W

Distance And Direction From Road Intersection
50 FT. N. OF O AVE. 50 FT. E. OF S. 10TH ST.
8297 E. O AVE., KALAMAZOO 49001
Street Address Or City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 861.00 msl

OWNER OF WELL: DEZEEUW SIMCOE
Address: 8297 E. O AVE.
KALAMAZOO, MI 49001
Address Same As Well Location? [x] Yes [ ] No

WELL DEPTH: 71.0 FT. | Date Completed: 06/21/86 | [ ] New Well [ ] Replacement Well

[ ] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[x] Hollow rod [ ] Auger/Bored [ ] Jetted [ ] _____

USE [x] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type III Public [ ]

CASING: [ ] Steel [x] Threaded [ ] Welded [ ] Plastic — Height: Above Surface 0.0 ft.
Diameter
2.00 in. to 44.0 ft. depth
0.00 in. to 0.0 ft. depth
Cased Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight lbs/ft.
Drive Shoe [ ] Yes [ ] No

SCREEN [ ] Not Installed
Type Stainless Steel Diameter 1.25
Slot 0.015 Length 3.0
Set between 70.00 ft. and 71.00 ft.
FITTINGS: [ ] Packer [ ] Wood Packer [ ] Perforated Casing [ ] Blank above screen 0.0 ft. Other

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
RED CLAY LOAM	8	8
FINE GRAVEL	24	32
BLUE CLAY	21	53
YELLOW CLAY	1	54
BLUE CLAY FINE SAND	9	63
VERY FINE SAND	5	68
RED. SAND	5	73

STATIC WATER LEVEL:
9.50 ft. below land surface [ ] Flow

PUMPING LEVEL: below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

WELL HEAD COMPLETION: [x] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

WELL GROUTED? [ ] No [ ] Yes From 0 ft. To 71 ft.
[ ] Material not [ ] Bentonite [ ] Other
No. of bags of cement 5 Additives

Nearest source of possible contamination
Type Septic Distance 50 ft. Direction N
Well disinfected upon completion? [ ] No [x] Yes
Was old well plugged? [ ] No [ ] Yes

PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name GOULDS
Model number HP 2" Volts
Length of Pump Pipe 21 ft. Capacity 0 G.P.M.
Type: [ ] Submersible [x] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

Remarks, elevation, source of info, etc.
USGS

Data Source: Michigan Groundwater Survey

Rig Operator's Name:

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.

0208
REGISTERED BUSINESS NAME — REGISTRATION NO.

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL: 391 1002001 | A7 | Tax Parcel #

County: KALAMAZOO | Township Name: PRAIRIE | Fraction: NW 1/4 NW 1/4 NW 1/4 | Section: 02 | Town: 01 S | Range: 10 W

Distance And Direction From Road Intersection
.5 MI. E. OF 31ST ST. 10± FT S. OF E. K AVE.
9028 E. N AVE. KALAMAZOO 49001
Street Address & city of Well Location

Locate with 'X' in Section Below | Sketch Map

ELEVATION 862.00 msl

1 OWNER OF WELL: RICHARD ARMINTROUT
Address: 9028 E. N AVE.
KALAMAZOO, MI 49001
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 59.0 Ft. | Date Completed: 08/08/77 | [ ] New Well [ ] Replacement Well

5 [x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [x] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type III Public [ ]

7 CASING: [ ] Steel [x] Threaded | Weight: Above | Height: Above Surface 1.0 ft.
[ ] Plastic [ ] Welded
Diameter
4.00 in. to 54.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. Depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.010 Length 1.0
Set between 54.00 ft. and 58.00 ft.
FITTINGS: [ ] Gravel [ ] Bead Packer [ ] Bronze Sheet
[ ] Blank above screen 0.0 ft. other

9 STATIC WATER LEVEL:
10.00 ft. Below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
20 ft. after 1.0 hrs. pumping at 10 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [x] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [x] No [ ] Yes Grout to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 Ft. Direction
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name PEEA
Model number HP .75 Volts
Length of Drop Pipe 40 ft. Capacity 10 G.P.M.
Type: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 10 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH to Bottom of STRATUM
BROWN CLAY & SAND	8	8
SAND	7	15
GRAY CLAY	36	51
COARSE SAND	5	56

15. Remarks, elevation, source of data, etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

[ ]
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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This is [illegible] document.

WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 3707119300 | B2 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	SW 1/4 SE 1/4 NW 1/4	06	03 S	11 W

= Road Intersection

WEDGEWOOD 1,
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 915.14 msl

3 OWNER OF WELL: CITY OF PORTAGE
Address

Address Same As Well Location? | | Yes [x] No

4 WELL DEPTH: 105.5 FT. | Date Completed: 04/15/91 | | | New Well | | Replacement Well

5 | | Cable tool | | Rotary | | Driven | | Dug
| | Hollow rod | | Auger/Bored | | Jetted | [x] Unknown

6 USE | | Domestic | | Irrigation | [x] Test Well | Type I Public | Type II Public | Type III Public | Heat Pump | Type III Public | |

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOPSOIL,CLAY	2	2
SAND & GRAVEL	2	4
SAND	45	49
SAND	18	67
SAND	14	81
SAND	4	85
SAND	8	93
SAND	1	94
SAND & GRAVEL	2	96
SAND	1	97
SAND & GRAVEL	4	101
CLAY	3	104
SILT	1	105

7 CASING: | | Steel | | Plastic | | Threaded | | Welded | Height: Above Surface 0.0 ft.
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight lbs/ft.
Drive Shoe | | Yes | | No

8 SCREEN | | Not Installed
Type Diameter 0.00
Make 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: | | K-Packer | | Wood Packer | | Bronner Check
| | Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
0.00 ft. below land surface

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: | | Pitless adapter | | Basement offset | | 12" above grade | Approved pit

12 WELL GROUTED? | | No | | Yes From to ft.
| | Neat cement | | Bentonite | | Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? | | Yes | | No
Was old well plugged? | | Yes | | No

14 PUMP: | | Not Installed | | Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M.
TYPE: | | Submersible | | Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date

AUTHORIZED REPRESENTATIVE

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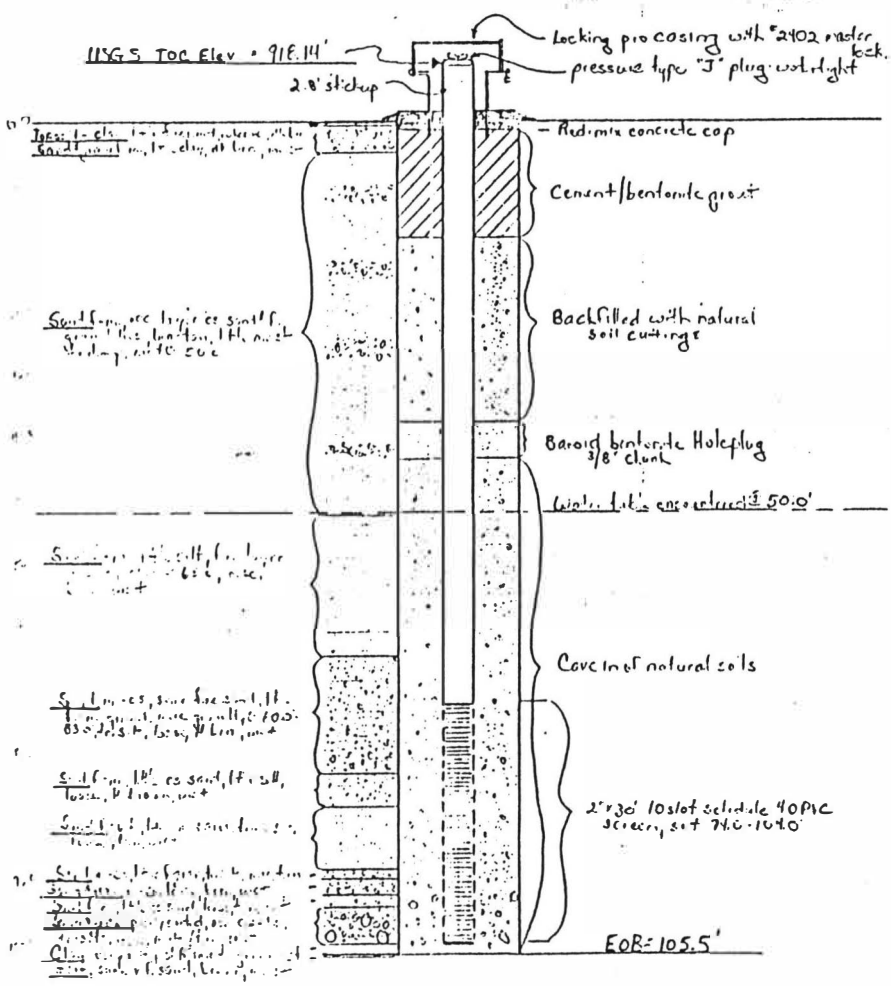
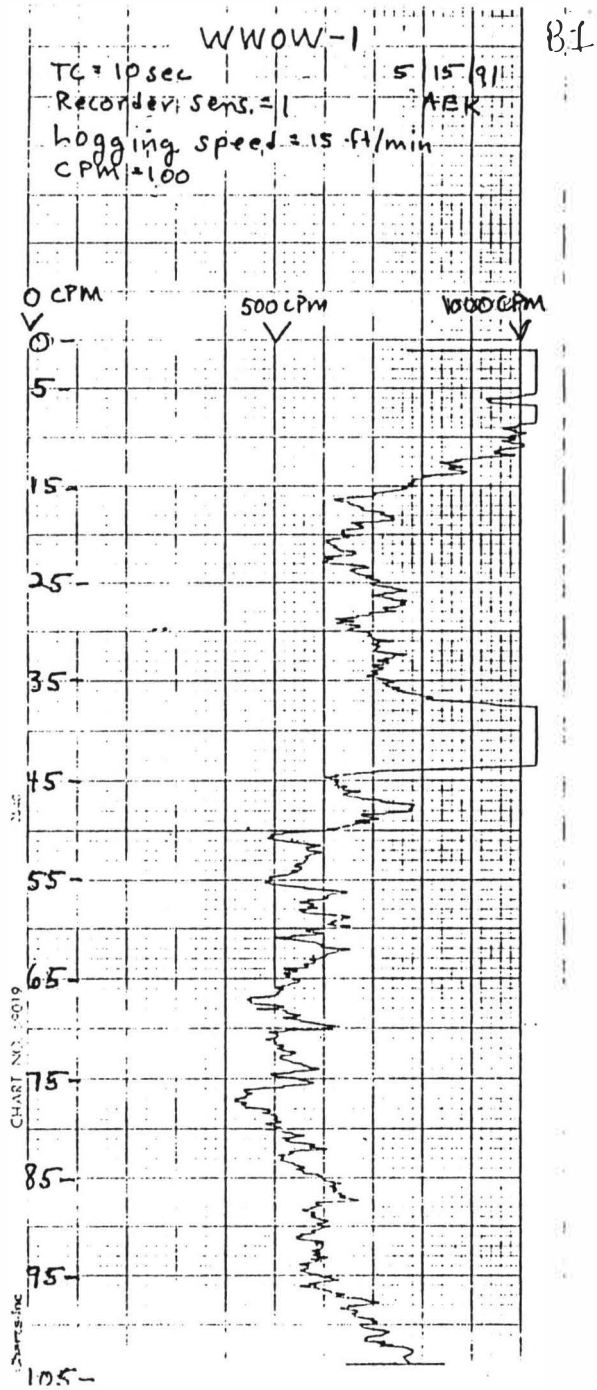
Calculation Sheet

Computed by C. Cotleo
Checked by _____

Subject Wildow - Diagram Sheet 1 of 1
Wedgewood well field Job No. 91197
Client City of Portage Date 4/15/91




WWOW-1
B1
TC = 10 sec
5 15 91
Recorder sens. = 1
AEK
logging speed = 15 ft/min
CPM = 100
0 CPM
500 CPM
1000 CPM
0
5
15
25
35
45
55
65
75
85
95
105
CHART NO. 3019

WATER WELL AND PUMP RECORD

[page 1 of 1]

LOCATION OF WELL	3721101100	B2	Tax Parcel

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	SE 1/4 NE 1/4 NE 1/4	01	03 S	11 W

Distance And Direction From Road Intersection
1111. DILLON [t. 800' S. OF KILGORE, 1400' W OF WESTNED

Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 999.00 msl

1 OWNER OF WELL: CITY UTILITIES
Address: 415 STOCKBRIDGE
KALAMAZOO, MI 49001
Address Same As Well Location? [ ] Yes [x] No

3 WELL DEPTH: 260.0 FT. | Date Completed 05/21/99 | [ ] New Well [ ] Replacement Well

[ ] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted [x] Unknown

4 USE | Domestic | Type I Public | Type III Public
Irrigation | Type II Public | Heat Pump
Test Well | Type IIb Public | Unknown

7 CASING: [ ] Steel [ ] Plastic | [ ] Threaded [ ] Welded | Height: Above Surface 0.0 ft.
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [ ] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Unknown Diameter 0.00
Make 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Dremmer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
999.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BLACK MUCK	2	2
BLACK FINE SAND	8	10
YELLOW SAND	25	35
GRAY SAND & GRAVEL	8	43
COARSE, GRAY SAND & GRAVEL	41	84
GRAY SAND, GRAVEL W/LITTLE CLAY	12	96
FINE GRAY SAND	7	103
YELLOW SAND, GRAVEL &R. STONES	5	108
YELLOW SAND & CLAY	4	112
HARD PAN	10	122
GRAY SAND & CLAY	14	136
GRAY SAND , GRAVEL , LITTLE CLAY	4	140
COARSE GREY GRAVEL, SAND .STONES	22	162
HARD PAN	88	249
SHALE	20	269

15.Remarks,elevation,source of data,etc.

Data Source:

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 397111101400 | B3 Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	NW 1/4 NE 1/4 NE 1/4	01	03 S	11 W

Distance And Direction From Road Intersection
2121 S OF TRAF SHOOT RAGE (BRONKER)

Street Address & City of Well Location

Locate with 'X' in Section Below

Sketch Map

ELEVATION 799.00 msl

3 OWNER OF WELL CITY UTILITIES
Address 415 STOCKBRIDGE
KALAMAZOO, MI 49001
Address Same As Well Location? | | Yes [x] No

4 WELL DEPTH: 220.0 FT. | Date Completed 11/20/98 | | | New Well | Replacement Well

5 [x] Cable tool | | Rotary | | Driven | | Dug
| | Hollow rod | | Auger/Bored | | Jetted ____

6 USE | | Domestic | | Irrigation | [x] Test Well | | Type I Public | | Type II Public | | Type III Public | | Heat Pump | | Type IV Public |

7 CASING: | | Steel | | Plastic | | Threaded | | Welded | Height: Above Surface 0.0 ft.
Diameter
6.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe | | Yes | | No

8 SCREEN | | Not Installed
Type Unknown Diameter 0.00
Open 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: | | K-Packer | | Bead Packer | | Bronner Check
| | Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
0.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: | | Pitless adapter | | Basement offset | | 12" above grade | | Approved pit

12 WELL GROUTED? | | No | | Yes From to ft.
| | Neat cement | | Bentonite | | Other
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? | | Yes | | No
Was old well plugged? | | Yes | | No

14 PUMP: | | Not Installed | | Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop pipe 0 ft. capacity 0 G.P.M.
TYPE: | | Submersible | | Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	5	5
YELLOW CLAY	7	12
YELLOW SAND & CLAY	8	20
GRAY GRAVEL & SAND	10	30
YELLOW GRAVEL & SAND	10	40
HARD PAN	60	100
YELLOW SAND & CLAY	5	105
YELLOW SAND	5	110
YELLOW SAND & CLAY	12	122
GRAY SAND & GRAVEL	8	130
COARSE	10	140
LITTLE YELLOW CLAY	4	144
CLAY	3	147
COARSE SAND	7	154
COARSE SAND & GRAVEL W/STONES STATIC 1'6"	3	157
COARSE GRAVEL & SAND	5	162
FINE GRAY SAND	12	174
COARSE SAND & GRAVEL	5	179
FINE GRAY SAND & CLAY	11	190
COARSE GRAVEL & CLAY	7	197

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION No.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 2 of 2

B3

1 LOCATION OF WELL 3927110100 Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	NW 1/4 NE 1/4 NE 1/4	03	03 S	11 W

Distance And Direction From Road Intersection
8121 S OF TRAP SHOOT RANGE (BROOKER)

Street Address & City of Well Location

Locate with 'X' in Section Below

Sketch Map

ELEVATION 999.00 est

3 OWNER OF WELL: CITY UTILITIES
Address: 415 STOCKBRIDGE
KALAMAZOO, MI 49001
Address Same As Well Location? [ ] Yes [X] No

4 WELL DEPTH: 220.0 FT. | Date Completed: 11/20/98 | [ ] New Well [ ] Replacement Well

5 [X] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [ ] Domestic [ ] Irrigation [X] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb public | [ ] Type III Public [ ] Heat Pump

7 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
GRAY SAND & CLAY BALLS	3	200
CLAY & SAND	14	214
BLUE CLAY	3	217
CLAY & FINE GRAY SAND	3	220

12 CASING: [ ] Steel [ ] Plastic [ ] Threaded [ ] Welded
Height: Above Surface 0.0 ft.
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [ ] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Unknown Diameter 0.00
Make 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bronner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
0.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 397311101300 | B4 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	NE 1/4 SW 1/4 S			11 W

Distance And Direction From Road Intersection

LEXINGTON/GREEN E,
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 856.00 msl

3 OWNER OF WELL CITY OF PORTAGE
Address
MI
Address Same As Well Location? | | Yes [x] No

4 WELL DEPTH: 190.0 FT. | Date Completed 05/03/91 | | | New Well | | | Replacement Well

5 | | Cable tool | | Rotary | | Driven | | Dug
| | Hollow rod | | Auger/Bored | | Jetted [x] Unknown

6 USE | Domestic | Irrigation | Test Well | Type I Public | Type II Public | Type IIb Public | Type III Public | Heat Pump

7 CASING: | | Steel | | Plastic | | Threaded | | Welded
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Cracked Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Height: Above Surface 0.0 ft.
Weight __ lbs/ft.
Drive Shoe [x] Yes | | No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOPSOIL	4	4
CLAY	4	8
SAND	7	15
CLAY	3	18
SAND	9	27
CLAY & SAND	48	75
SAND	29	104
GRAVEL,	11	115
VERY SANDY CLAY	17	132
SAND AND GRAVEL	48	180
CLAY AND SAND	10	190

8 SCREEN | | Not Installed
Type Unknown Diameter 0.00
Make 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: | | K-Packer | | Bead Packer | | Drawpan Check
| | Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
12.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: | Pitless adapter | Basement offset | 12" above grade | Approved pit

12 WELL GROUTED? | No | Yes From to ft.
| Neat cement | Bentonite | Other
No. of bags of cement __ Additives

" contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [x] Yes | No
Was old well plugged? | Yes | No

14 PUMP: | Not Installed | Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M.
TYPE: [x] Submersible | Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15. Remarks, elevation, source of data, etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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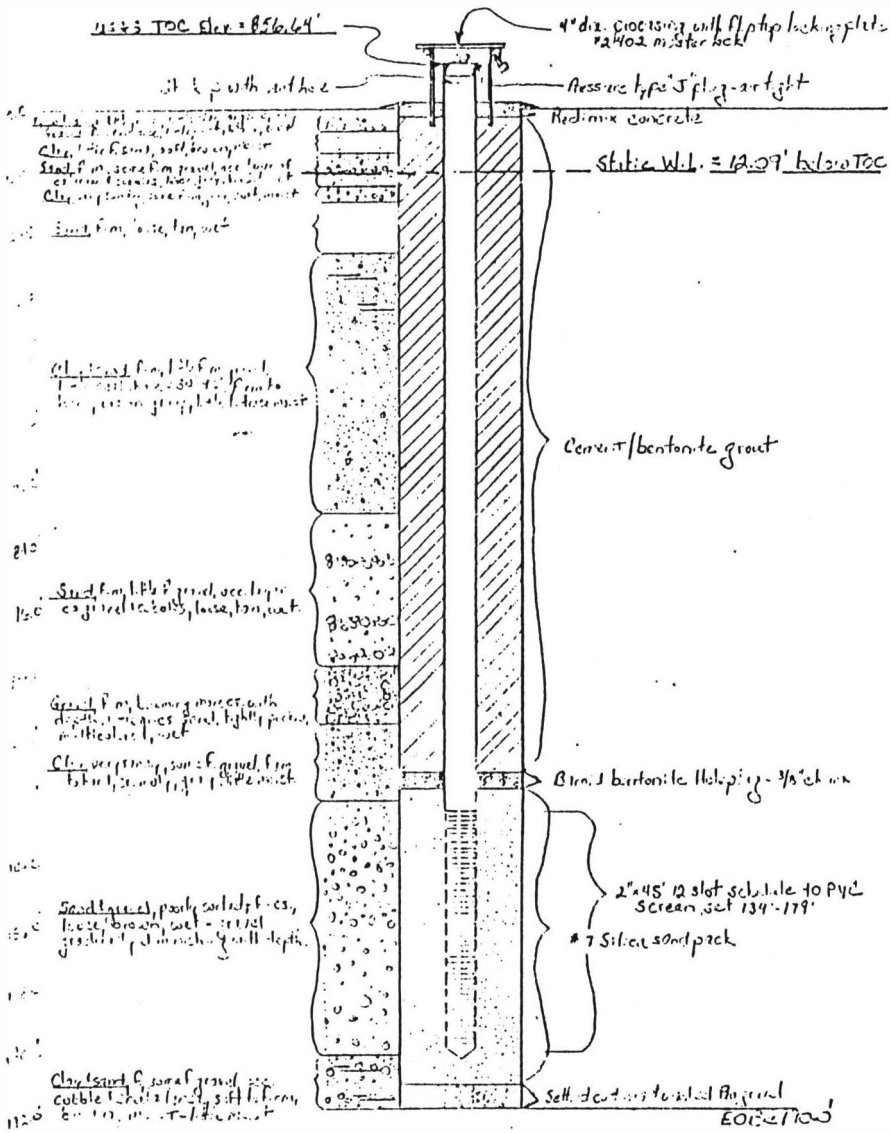
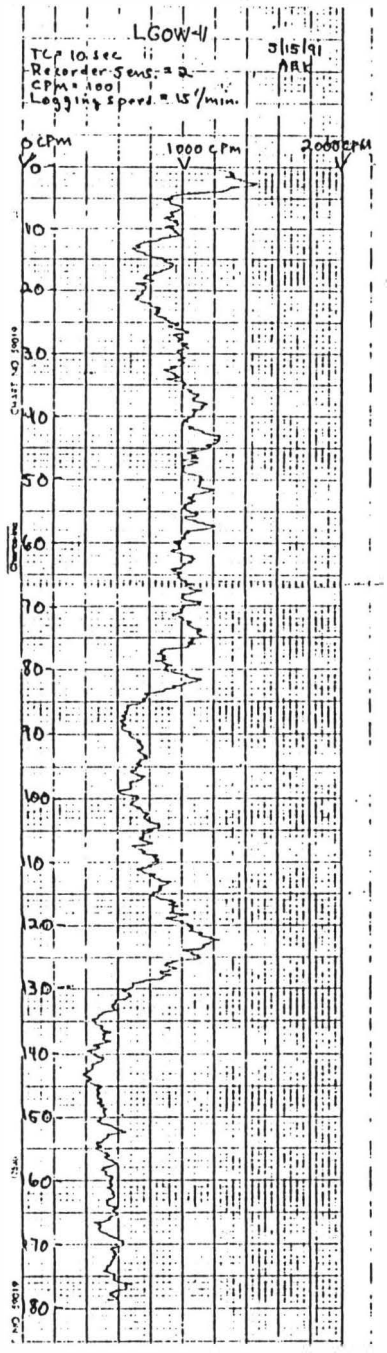
Calculation Sheet B-4

Computed by C.S. — Subject Well #1 — Sheet 1 of 1
Checked by ____ — Lexington Grand — Job No. 31597
Client Port Jefferson — Date 5/31/91




LGOW-11
TCp 10 sec
Recorder Sens. = 2
CPM = 1000
Logging speed = 15'/min.
5/15/91
ABH
0 CPM
1000 CPM
2000 CPM
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180

LB

WATER WELL AND PUMP RECORD

LOCATION OF WELL 1971101B001	B5	Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PAVILION	NW 1/4 NE 1/4 SW 1/4	18	01 S	10 W

Distance And Direction From Road Intersection
.5 MI. S. OF P AVE. .2 MI W. OF 25TH ST.
7529 S. 25TH ST., KALAMAZOO 49001
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 866.00 msl

3 OWNER OF WELL: MURPHY CONST. CO.
Address: 7528 S. 25TH ST.
KALAMAZOO, MI 49001
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 90.0 FT. | Date Completed: 08/01/77 | [ ] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Hollow rod | [ ] Rotary [ ] Auger/Bored | [ ] Driven [ ] Jetted | [ ] Dug

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump

7 CASING: [ ] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 85.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 3.00
SLOT 0.010 Length 5.0
Set between 85.00 ft. and 90.00 ft.
FITTINGS: [ ] K-Packer [ ] Bead Packer [ ] Drawdown Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
25.90 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Septic Distance 50 ft. Direction E
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name MYERS
Model number HP .5 Volts
Length of Drop Pipe 13 ft. capacity 12 G.P.M.
TYPE: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 12 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND GRAVEL	30	30
SAND	10	40
BLUE CLAY	31	71
FINE SAND	6	76
WATER SAND	14	90

15. Remarks, elevation, source of data, etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

0267
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 39731926001 | B6 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PAVILLION	NW 1/4 NW 1/4 SE 1/4	20	03 S	10 W

Distance And Direction From Road Intersection
.5 MI. W. OF 2RIW ST. 5º FT. S. OF QR AVE.
6648 QR AVE., KALAMAZOO 49001
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 861.00 msl

1 OWNER OF WELL: HENRY ROODBERGER
Address: 6648 QR AVE. KALAMAZOO, MI 49001
Address Same As Well Location? [x] Yes [ ] No

3 WELL DEPTH: 75.0 FT. | Date Completed: 08/02/76 | [ ] New Well [ ] Replacement Well

4 [x] Cable Tool [ ] Rotary [x] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE: [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
FILL	5	5
MARL	20	25
CLAY	15	40
VERY FINE SAND	30	70
COARSE SAND	5	75

7 CASING: [ ] Steel [ ] Plastic [ ] Threaded [ ] Welded
Height: Above Surface 0.0 ft.
Diameter
2.00 in. to 72.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [ ] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 0.00
SLOT 0.020 Length 1.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [X]Packer [ ]Stop Packer [ ]Drawer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
7.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]12" above grade [ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Septic Distance 75 ft. Direction N
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP 1.5 Volts
Length of Drop Pipe 25 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [x]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

0708
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

1 LOCATION OF WELL 39731021001 | B7 Page 1 of 1 Tax Parcel #

County: KALAMAZOO | Township Name: PAVILION | Fraction: NE 1/4 SE 1/4 SW 1/4 | Section: 21 | Town: 03 S | Range: 10 W

Distance And Direction From Road Intersection
.25 MI S. OF OR AVE., 50 FT. W. OF 29TH ST.
8764 S. 29TH ST., SCOTTS 49088
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 841.00 msl

3 OWNER OF WELL: RAY FARLEY
Address: 8764 S. 29TH ST.
SCOTTS, MI 49088
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 95.0 FT. | Date Completed: 08/29/85 | [ ] New Well [ ] Replacement Well

5 [x] Cable Tool [ ] Hollow rod | [ ] Rotary [ ] Auger/Bored | [ ] Driven [ ] Dug [ ] Jetted

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type III Public | [ ] Type IV Public [ ] Heat Pump

7 CASING: [ ] Steel [x] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 91.0 ft. depth
1.00 in. to 95.0 ft. depth
Weight ___ lbs/ft.
Grouted Drill Hole Diameter
8.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [ ] Yes [x] No

8 SCREEN [ ] Not Installed
Type Unknown Diameter 1.00
SLOT 0.010 Length 5.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ] K-Packer [ ] Bead Packer [ ] Reducer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
0.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 1.0 hrs. pumping at 50 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [x] No [ ] Yes From ft. to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement ___ Additives ___

13 Nearest source of possible contamination
Type Septic Distance 60 ft. Direction
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name STANDARD
Model number HP [Volts
Length of Drop Pipe 42 ft. capacity 0 G.P.M.
TYPE: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & CLAY	24	24
SAND (WATER BEARING)	45	69
SAND & CLAY	22	91
SAND (WATER)	7	98

15. Remarks, elevation, source of data, etc.
SAMPLE 5-20-86 WS

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 0434

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 17031035001 | BB | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PAVILION	SW 1/4 NW 1/4 NW 1/4	35	03 S	10 W

Distance And Direction From Road Intersection
.25 MI. W. OF 14TH ST., 50 FT. S. OF S AVE.
8952 E. S AVE., SCOTTS 49088
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 856.00 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY & GRAVEL	12	12
SAND & GRAVEL	18	30
GRAY CLAY & GRAVEL	20	50
GRAY SILT	30	80
SOFT GRAY CLAY	28	108
COARSE SAND & GRAVEL	4	112

15.Remarks,elevation,source of data,etc.
PERMIT #6972

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

3 OWNER OF WELL NANCY GRARICE
Address 8952 E. S AVE.
SCOTTS, MI 49088
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 112.0 FT. | Date Completed 12/18/87 | [ ] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Hollow rod | [ ] Rotary [ ] Auger/Bored | [ ] Driven [ ] Dug [ ] Jetted

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type III Public | [ ] Type III Public [ ] Heat Pump

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 108.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight _ lbs/ft.
Drive Shoe [x] Yes [ ] No
Corded Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 15.000 Length 4.0
Set between 108.00 ft. and 112.00 ft.
FITTINGS: [ ] K-Packer [ ] Bead Packer [ ] Screen Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
15 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] Neat cement [x] Bentonite | [No [x]Yes From to ft. [ ] Other
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 80 ft. Direction W
Well disinfected upon completion? [x]Yes [ ] No
Was old well plugged? [x]Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name STA RITE
Model number HP .5 Volts
Length of Drop Pipe 42 ft. capacity 14 G.P.M.
Type: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 14 Gallons

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.

0112
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 3973103S002 | B9 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PAVILION	SE 1/4 SW 1/4 NE 1/4	35	03 S	10 W

Distance And Direction From Road Intersection
.25 MI W. OF 34TH ST., 100 FT. S. OF TS AVE.
9810 TS AVE., VICKSBURG 49097
Street Address & City of Well Location

3 OWNER OF WELL: TOM REFFER
Address: 9810 TS AVE.
VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

Locate with 'X' in Section Below

Sketch Map

ELEVATION 880.00 msl

4 WELL DEPTH: 72.0 FT. | Date Completed 09/00/75 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Hollow rod | [ ] Rotary [ ] Auger/Bored | [ ] Driven [x] Jetted | [ ] Dug

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND (BROWN)	9	9
SAND (GRAY)	6	15
SAND (RED)	6	21
SAND & CLAY	11	32
SAND	2	34
SAND & CLAY	30	64
SAND (WATER BEARING)	9	72

7 CASING: [ ] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
2.00 in. to 69.0 ft. depth
1.25 in. to 72.0 ft. depth
Weight lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 1.25
Slot 0.010 Length 4.0
Set between 68.00 ft. and 72.00 ft.
FITTINGS: [ ] Reducer [ ] Bead Casker [x] Strainer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
15 ft. after 0.5 hrs. pumping at 15 G.P.M.
15 ft. after 0.5 hrs. pumping at 9 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [x] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Septic Distance 8 ft. Direction S
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name GOULD
Model number HP .5 Volts
Length of Drop Pipe 10 ft. Capacity 12 G.P.M.
TYPE: [ ] Submersible [x] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 12 Gallons

15. Remarks, elevation, source of data, etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO. 814

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 11740700C004 | BIO | Tax Parcel |

County	Township Name	Direction	Section	Town	Range
KALAMAZOO	WAKESHMA	FT 1/4 SW 1/4 SW 1/4	06	04 S	09 W

Distance And Direction From Road Intersection
250' E OF 36TH AND 100' S OF T
11100 T AVENUE, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below

Sketch Map

ELEVATION 900.00 est

1 OWNER OF WELL: HOUGHTON, GERALD
Address: 4414 TU AVENUE
VICKSBURG, MI 49097
Address Same As Well Location? | | Yes [x] No

4 WELL DEPTH: 100.0 FT. | Date Completed 11/25/85 | | | New Well | | Replacement Well

5 | | Cable tool | | Rotary | | Driven | | Dug
[x] Hollow rod | | Auger/Bored | | Jetted | | _____

6 USE [x] Domestic | Irrigation | Test Well | Type I Public | Type II Public | Type IIb Public | Type III Public | Heat Pump

7 CASING: [x] Steel | Plastic | [x] Threaded | Welded | Height: Above Surface 1.0 ft.
Diameter
2.00 in. to 74.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Cased Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe | | Yes [x] No

8 SCREEN [x] Not Installed
Type None Diameter 0.00
Make 0.000 Length 0.0
Set Between 0.00 ft. and 0.00 ft.
FITTINGS: | K-Packer | Lead Packer | Drawdown Check
| | Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
3.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter | [2"] above grade
| [Basement offset | [Approved pit

12 WELL GROUTED? [x]No | [Yes From to ft.
| [Neat cement | [Bentonite | [Other
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 55 ft. Direction S
Well disinfected upon completion? [x]Yes | [No
Was old well plugged? | [Yes | [No

14 PUMP: [x]Not Installed | [Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: | [Submersible | [Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	18	18
SAND LIGHT GRAVEL BROWN CLAY	7	25
BROWN CLAY & GRAVEL	8	33
GREY CLAY & FINE TO COARSE GRAVEL	20	53
GREY CLAY & FINE SAND & GRAVEL	21	74
BLUE SHALE	26	100

15.Remarks,elevation,source of data,etc.
OPEN HOLE TO 100'

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

1 LOCATION OF WELL 39740700902 | B11 | Page 1 of 1 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	KARESHMA	SE 1/4 NW 1/4	08	04 S	09 W

Distance And Direction From Road Intersection
2400' S OF M AND 100' W OF 35TH
12538 S 39TH STREET, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 915.00 msl

3 OWNER OF WELL: FRITZ, DONALD
Address: 12588 S 39TH STREET, VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 180.0 FT. | Date Completed: 05/20/95 | [ ] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Hollow rod | [ ] Rotary [ ] Auger/Bored | [ ] Driven [ ] Dug [ ] Jetted

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type III Public | [ ] Type III Public Heat Pump

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 0.0 ft.
Diameter
4.00 in. to 96.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

8 SCREEN [x] Not Installed
Type None Diameter 0.00
Make 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Drawdown Check [ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
33.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 0.0 hrs. pumping at 50 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] No [x] Yes From to ft.
[ ] Neat cement [x] Bentonite [ ] Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Septic Distance 50 ft. Direction NE
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name GRUNDFOS
Model number NP .5 Volts
Length of Drop Pipe 62 ft. Capacity 15 G.P.M.
TYPE: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 15 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
CLAY & GRAVEL	19	19
SAND & GRAVEL	6	25
SOFT CLAY	13	38
CLAY & GRAVEL	8	46
GRAY SOFT	9	55
SOLID SANDY CLAY	25	80
CEMENTED GRAVEL	12	92
SHALE	2	94
SANDSTONE	6	100

15. Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

0763
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

C1

1 LOCATION OF WELL 39731211012 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	TEXAS	SW 1/4 SE 1/4 NE 1/4	11	03 S	12 W

Distance And Direction From Road Intersection
1450' E, 2100' S
9TH & O AVENUE, KALAMAZOO 49009
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 915.00 msl

1 OWNER OF WELL: CITY OF KALAMAZOO
Address: 415 STOCKBRIDGE
KALAMAZOO, MI 49009
Address Same As Well Location? | | Yes |x| No

3 WELL DEPTH: 362.0 FT. | Date Completed 10/01/71 | | New Well | | Replacement Well

4 |x| Cable tool | | Rotary | | Driven | | Dug | | Bollow rod | | Auger/Bored | | Jetted _____

5 USE | |Domestic | |Irrigation | |Test Well | |Type I Public | |Type II Public | |Type IIb Public | |Type III Public | |Heat Pump | |Other Public

7 CASING: |x| Steel | | Plastic | | Threaded | |x| Welded | Height: Above Surface 2.0 ft.
Diameter
12.00 in. to 342.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe |x| Yes | | No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND CLAY	4	4
SAND GRAVEL CLAY	8	12
SAND, GRAVEL, LITTLE CLAY	31	43
SAND, LITTLE GRAVEL, LITTLE CLAY	10	53
SAND, LITTLE GRAVEL	28	81
SAND, LITTLE GRAVEL, LITTLE CLAY	7	88
CLAY	4	92
SAND CLAY	14	106
CLAY SAND GRAVEL	7	113
SAND, GRAVEL, LITTLE CLAY	8	121
CLAY SAND GRAVEL	3	124
CLAY SAND	31	155
FINE SAND, CLAY	31	186
CLAY	28	214
SAND CLAY	6	220
SAND, LITTLE CLAY	5	225
MEDIUM SAND, LITTLE CLAY	5	230
SAND, LITTLE GRAVEL, LITTLE CLAY	25	255
SAND, GRAVEL, LITTLE CLAY	30	285
SAND, LITTLE GRAVEL, LITTLE CLAY	5	290

8 SCREEN | | Not Installed
Type Other Diameter 12.00
SLOT 0.060 Length 5.0
Set Between 342.00 ft. and 347.00 ft.
FITTINGS: | |K-Packer | |Lead Packer | |Drawner Check
| | Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
23.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
60 ft.after 4.0 hrs.pumping at 1000 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: | |Pitless adapter | |Basement offset |x|12" above grade | |Approved pit

12 WELL GROUTED? |x|No | |Yes From to ft.
| |Neat cement | |Bentonite | |Other
No. of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Sewer Distance 2500 ft. Direction NW
Well disinfected upon completion? |x|Yes | |No
Was old well plugged? | |Yes | |No

14 PUMP: | |Not Installed | |Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: | |Submersible | |Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.
SLOT, 130 LENGTH 15', SET BETWEEN 147 AND 162

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME 0712 REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 2 of 2

1 LOCATION OF WELL 392112|012 |CA | Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	TEXAS	SW 1/4 SE 1/4 NE 1/4	11	03 S	12 W

Distance And Direction From Road Intersection
1450' E. 2100' S
9TH & O AVENUE, KALAMAZOO 49009
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 915.00 msl

3 OWNER OF WELL — CITY OF KALAMAZOO
Address — 415 STOCKBRIDGE
KALAMAZOO, MI 49007
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 342.0 Ft. | Date Completed 10/01/71 | [ ] New Well [ ] Replacement Well

5 [x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug [ ] Bolle [ ] Jetted

6 USE | [ ] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump [x] Other Public

7 CASING: [x] Steel [ ] Plastic | [ ] Threaded [x] Welded | Height: Above Surface 2.0 ft.
Diameter
12.00 in. to 342.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [ ] Yes [x] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND, GRAVEL, LITTLE CLAY	5	295
SAND, LITTLE CLAY	5	100
SAND, LITTLE GRAVEL, LITTLE CLAY	25	125
SAND, LITTLE CLAY	10	135
SAND, GRAVEL, LITTLE CLAY	10	145
SAND, LITTLE GRAVEL, LITTLE CLAY	12	157
SAND, GRAVEL, LITTLE CLAY, STONES	4	161
GRAVEL, SAND, LITTLE CLAY	16	177
GRAVEL, SAND, LITTLE CLAY, STONES	5	182

8 SCREEN [ ] Not Installed
Type Other — Diameter 12.00
SLOT 0.060 — Length 5.0
Set between 342.00 ft. and 147.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Drawpr Check [ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
21.00 ft. Below Lnd

10 PUMPING LEVEL: below land surface
60 ft.after 4.0 hrs.pumping at 1000 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ]Pitless adapter [ ]Basement offset | [x]12" above grade [ ]Approved pit

12 WELL GROUTED? [x]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Sewer Distance 2500 ft. Direction NW
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15. Remarks, elevation, source of data, etc.
SLOT, 130 LENGTH 15', SET BETWEEN 147 AND 162

Data Source: MDNR

17. Rig Operator's Name:

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.

0712
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 3973|106102 | C2 | Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	SE 1/4 SE 1/4 SW 1/4	06	03 S	11 W

Distance And Direction From Road Intersection

WESTFIELD,
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 905.05 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND AND GRAVEL	6	6
SAND	6	12
SAND	39	51
SAND	48	99
GRAVEL	12	111
SAND & GRAVEL	11	122
CLAY , SILTY	5	127
SAND	9	136
SAND	3	139
GRAVEL & SAND	20	159
SAND , GRAVEL , SOME SHALE??	16	175

3 OWNER OF WELL CITY OF PORTAGE
Address
MI
Address Same As Well Location? | | Yes [x] No

4 WELL DEPTH: 195.0 FT. | Date Completed 04/29/91 | | | New Well | | | Replacement Well

5 | | Cable tool | | Rotary | | Driven | | Dug
| | Hollow rod | | Auger/Bored | | Jetted | [x] Unknown

6 USE | Domestic | | Irrigation | [x] Test Well | Type I Public | Type II Public | Type IIb Public | Type III Public | Heat Pump

7 CASING: | | Steel | | Plastic | | Threaded | | Welded | Weight: Above Surface 0.0 ft.
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes | | No

8 SCREEN | | Not Installed
Type Unknown Diameter 0.00
Make 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: | | K-Packer | | Bead Packer | | Brenner Check
| | Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
16.77 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: | |Pitless adapter | |Basement offset | |12" above grade | |Approved pit

12 WELL GROUTED? | |No | |Yes From to ft.
| | Neat cement | | Bentonite | |Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [x]Yes | |No
Was old well plugged? | |Yes | |No

14 PUMP: | |Not Installed | |Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M.
TYPE: [x]Submersible | |Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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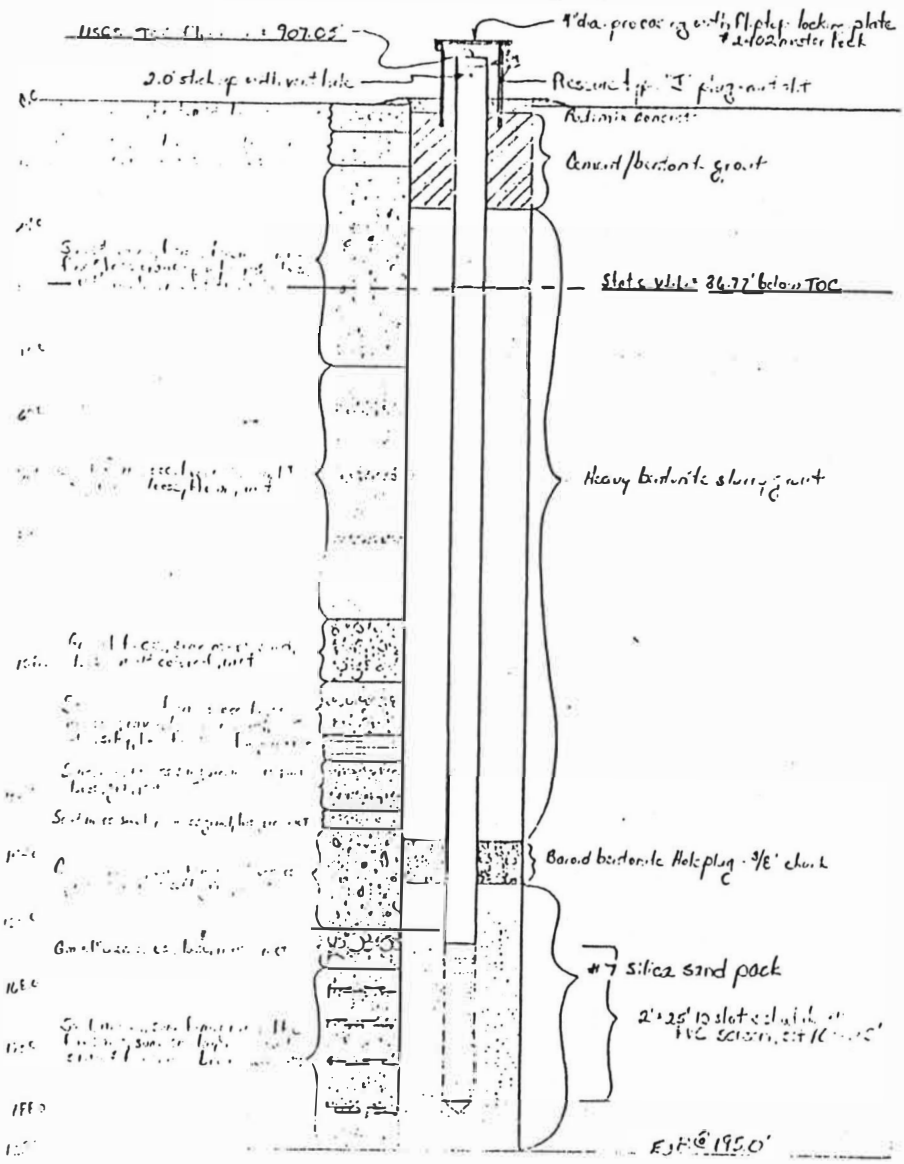
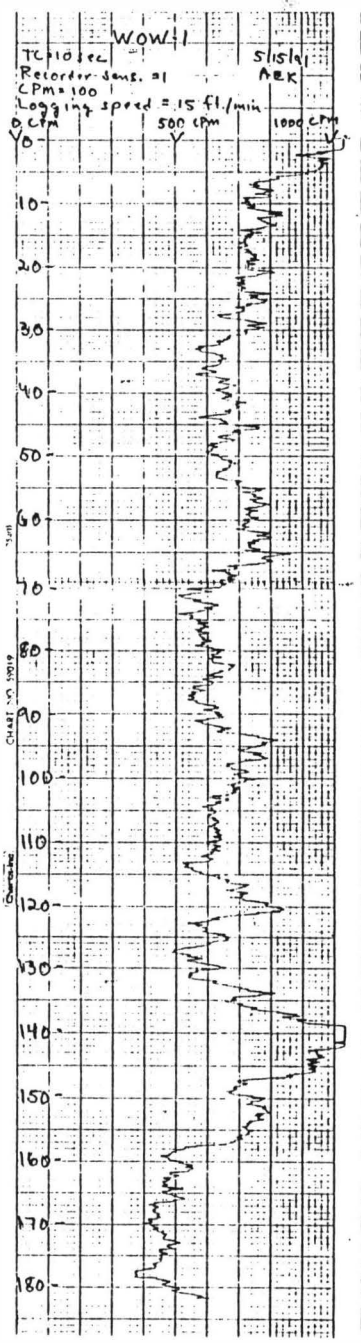
Calculation Sheet C2

Computed by _____ Subject WOW-1 well Sheet 1 of 1
Checked by _____ Job No. 5-97
Client _____ Date 4/29/97




W.O.W.-1
TC=10 sec
Recorder Sens. =1
CPM=100
Logging speed = 15 ft./min
0 cpm
500 cpm
1000 cpm
5/15/91
AEK
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180

C2

WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 10711108300 C3 Tax Parcel #

County: KALAMAZOO | Township Name: PORTAGE | Fraction: SE 1/4 NW 1/4 SW 1/4 | Section: 08 | Town: 03 S | Range: 11 W

Distance And Direction From Road Intersection

AMBERLY 2,
Street Address & City of Well Location

Locate with 'X' in S

Sketch Map

ELEVATION 905.57 msl

1 OWNER OF WELL CITY OF PORTAGE
Address MI
Address Same As Well Location? | | Yes |x| No

4 WELL DEPTH: 90.5 FT. | Date Completed 04/02/91 | | | New Well | | Replacement Well

5 | | Cable tool | | Rotary | | Driven | | Dug
| | Hollow rod | | Auger/Bored | | Jetted |x| Unknown

6 USE | |Domestic | |Type I Public | |Type III Public
| |Irrigation | |Type II Public | |Heat Pump
|x|Test Well | |Type IIb Public | | _____

7 CASING: | | Steel | | Threaded | Height: Above
| | Plastic | | Welded | Surface 0.0 ft.
Diameter
0.00 in. to 0.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe |x| Yes
0.00 in. to 0.0 ft. depth | | | No
0.00 in. to 0.0 ft. depth

8 SCREEN | | Not Installed
Type Stainless Steel Diameter 0.00
Jnkn 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: | |K-Packer | |Lead Packer | |Bremmer Check
| | Blank above screen 0.0

9 STATIC WATER LEVEL:
43.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: | |Pitless adapter | |12" above grade
| |Basement offset | |Approved pit

12 WELL GROUTED? | |No | |Yes From to ft.
| |Neat cement | |Bentonite | |Other_____
No. of bags of cement ___ Additives _____

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? |x|Yes | |No
Was old well plugged? | |Yes | |No

14 PUMP: | |Not Installed | |Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: |x|Submersible | |Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOPSOIL	1	1
SAND	11	12
SAND	21	33
SAND	12	45
SAND	24	69
SAND	9	78
SAND	3	81
GRAVEL	4	85
GRAVEL	5	90

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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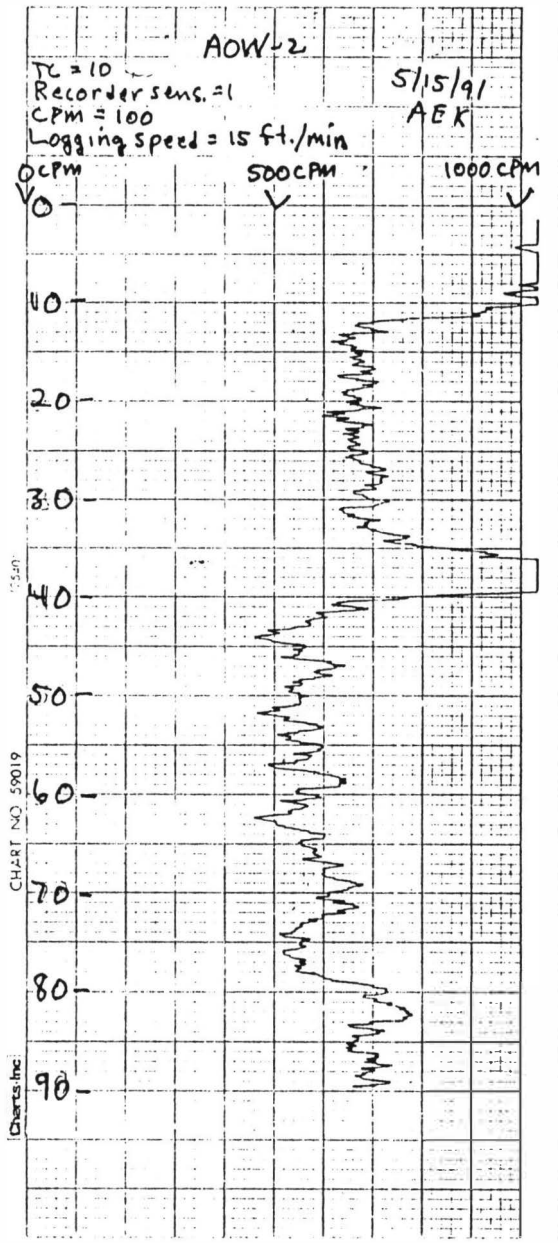

AOW-2
TC = 10
Recorder sens. = 1
CPM = 100
Logging speed = 15 ft./min
5/15/91
AEK
0 CPM
500 CPM
1000 CPM
0
10
20
30
40
50
60
70
80
90
CHART NO. 59019
Charts, Inc.

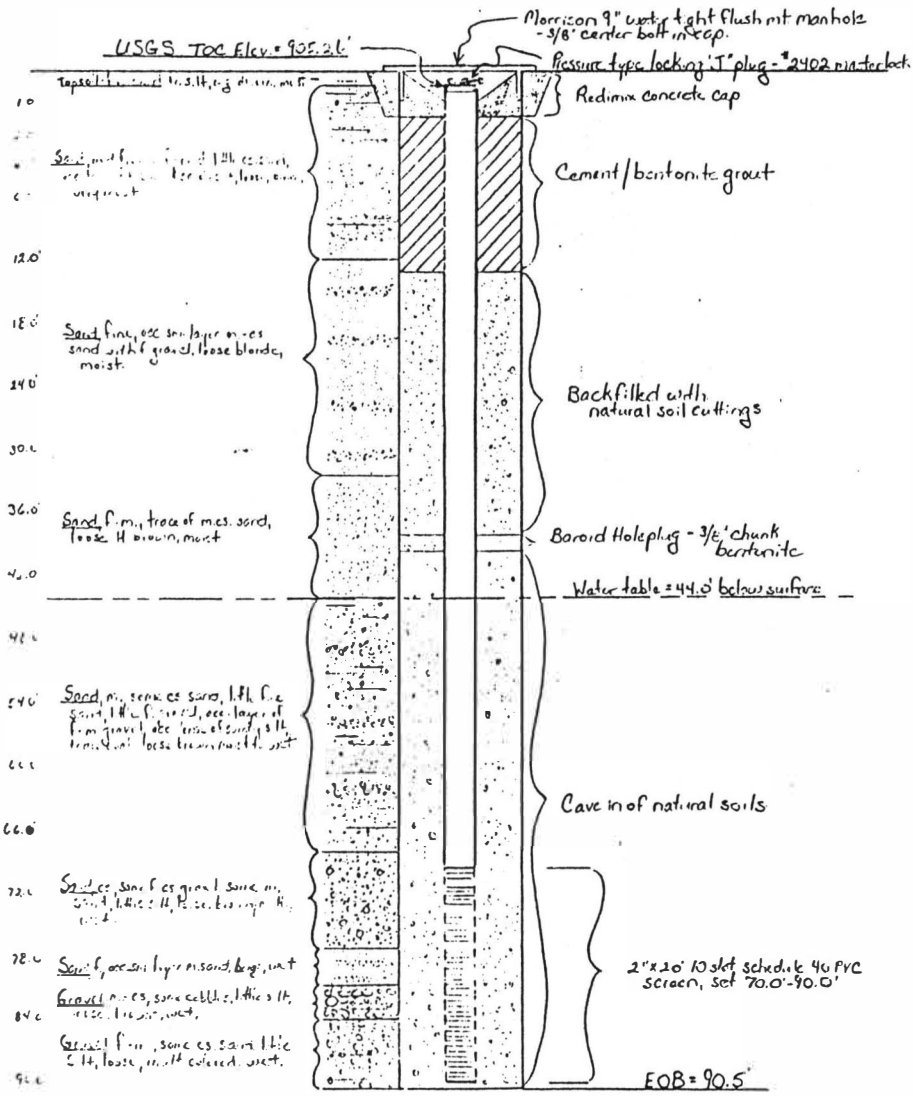
C3

Calculation Sheet C3

Computed by C.Calkins
Checked by _____

Subject Aow-2 diagram
Amberley well field
Client City of Portage

Sheet 1 of 1
Job No. 89597
Date 4/3/91



WATER WELL AND PUMP RECORD

page 1 of 2

1 LOCATION OF WELL 39731116300 | C-4 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	NW 1/4 SE 1/4 NW 1/4	16	03 S	11 W

Distance And Direction From Road Intersection

WINTERFOREST 1,
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 854.60 msl

3 OWNER OF WELL CITY OF PORTAGE
Address
MI
Address Same As Well Location? | | Yes | | No

4 WELL DEPTH: 111.0 FT. | Date Completed 04/18/91 | | | New Well | | Replacement Well

5 | | Cable tool | | Rotary | | Driven | | Dug
| | Hollow rod | | Auger/Bored | | Jetted | [x] Unknown

6 USE | | Domestic | | Irrigation | [x] Test Well | | Type I Public | | Type II Public | | Type IIb Public | | Type III Public | | Heat Pump | | _____

7 CASING: | | Steel | [x] Threaded | | Plastic | | Welded
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Height: Above Surface 0.0 ft.
Weight __ lbs/ft.
Drive Shoe [x] Yes | | No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOPSOIL-PEAT	1	1
SAND	1	2
PEAT	4	6
PEAT	1	7
SAND AND CLAY	2	9
SAND	4	13
SAND	4	17
SAND	1	18
SAND	5	23
SAND	4	27
SAND	5	32
SAND	8	40
SAND & GRAVEL	6	46
SAND	5	51
SAND	7	58
GRAVEL	4	62
SAND	2	64
SAND	1	65
CLAY	9	74
SAND	1	75

8 SCREEN | | Not Installed
Type Stainless Steel Diameter 0.00
Mnkn 0.000 Length 0.0
, and 0.00 ft.
FITTINGS: | [x]Packer | | Head Packer | | Bremmer Check
| | Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
7.50 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter | | Basement offset | | 12" above grade | | Approved pit

12 WELL GROUTED? | | No [x] Yes From to ft.
| | Neat cement [x] Bentonite | | Other _____
No of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 0 ft. Direction
Well disinfected upon completion? [x] Yes | | No
Was old well plugged? | | Yes | | No

14 PUMP: | | Not Installed | | Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [x] Submersible | | Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

1 LOCATION OF WELL 1971111A100 | C 4 page 2 of 2 Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	NW 1/4 SE 1/4 NW 1/4	16	03 S	11 W

Distance And Direction From Road Intersection

WINTER FOREST I,
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 854.60 msl

1 OWNER OF WELL CITY OF PORTAGE
Address
MI
Address Same As Well Location? [ ] Yes [ ] No

4 WELL DEPTH: 111.0 FT. | Date Completed 04/18/91 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted [x] Unknown

6 USE | [ ]Domestic [ ]Irrigation [x]Test Well | [ ]Type I Public [ ]Type II Public [ ]Type IIb Public | [ ]Type III Public [ ]Heat Pump

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	1	76
SAND	4	80
SAND	8	88
SAND	13	101
SAND	5	106
SAND	1	107
SAND & GRAVEL	3	110
SAND & CLAY	1	111

7 CASING: [ ] Steel [ ] Plastic [x] Threaded [ ] Welded
Height: Above Surface 0.0 ft.
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 0.00
Dnkn 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ]K-Packer [ ]Wood Packer [ ]Bremmer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
7.50 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Septic Distance 0 ft. Direction
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 HP Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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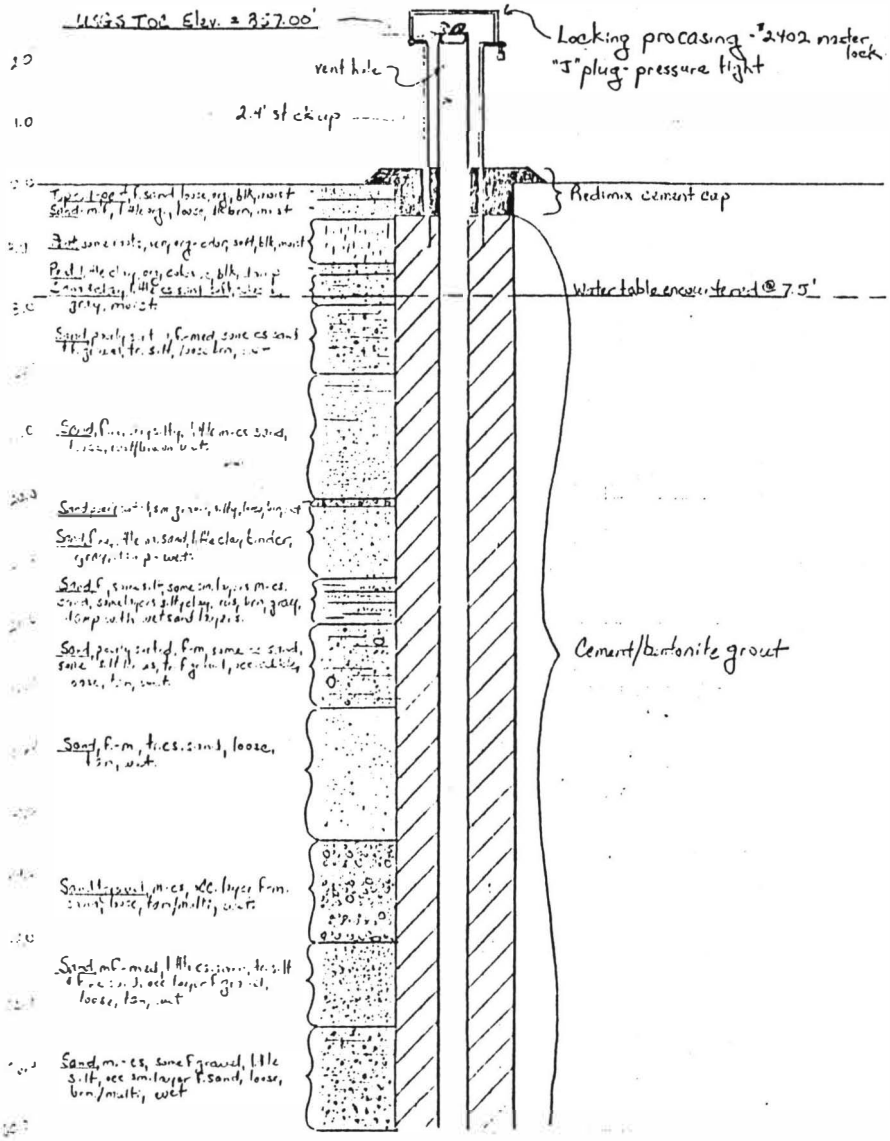
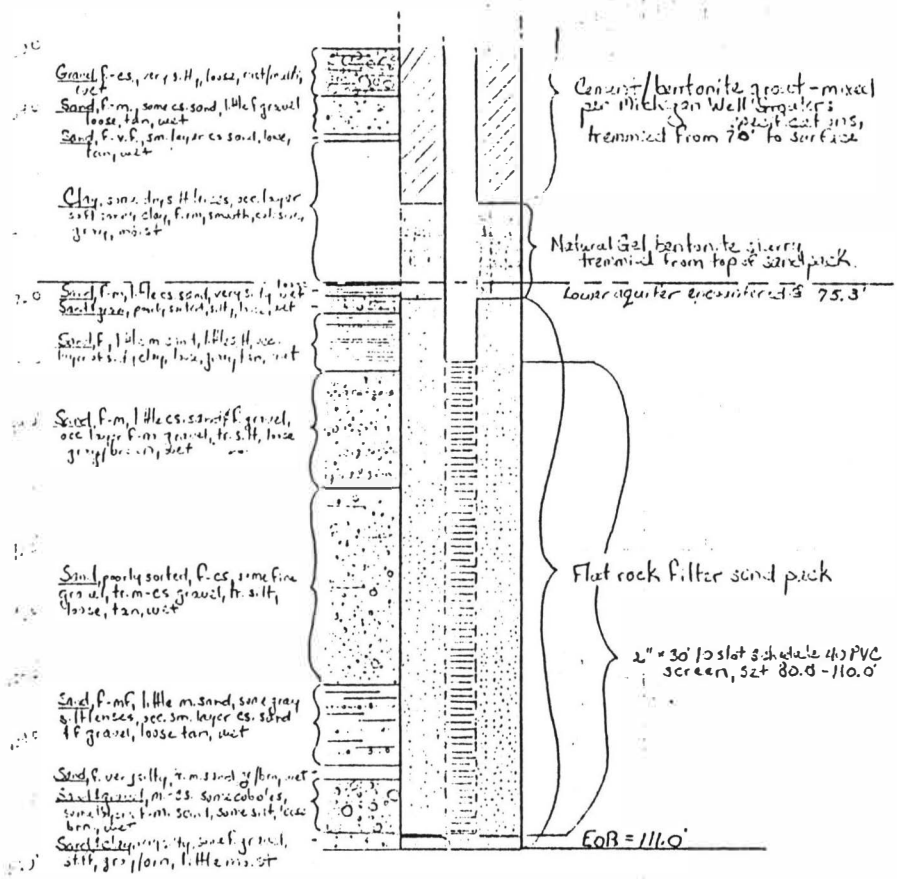
Calculation Sheet C-4

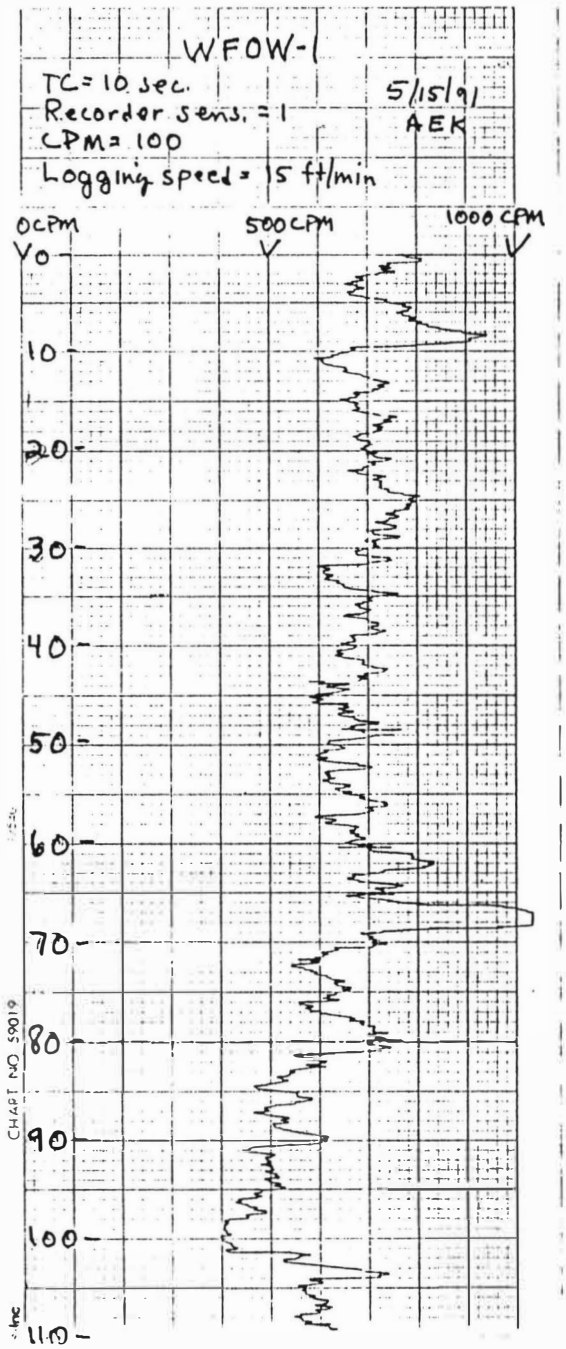
Computed by C. Cotton Subject Well-Diagram Sheet 1 of 2
Checked by _____ Winterforest well field Job No. 89597
Client City of Portage Date 4/18/91



Calculation Sheet C4

Computed by C.Cotton Subject WFOW-1d 12/91 Sheet 2 of 2
Checked by _____ Winterforest wellfield Job No. 89597
Client City of Portage Date 4/13/91




WFOW-1
TC = 10 sec.
Recorder sens. = 1
CPM = 100
Logging speed = 15 ft/min
5/15/91
AEK
C4
0CPM
500 CPM
1000 CPM
Vo
10
20
30
40
50
60
70
80
90
100
110
CHART NO 59019

WATER WELL AND PUMP RECORD

page 1 of 2

C5

1 LOCATION OF WELL 39731114200 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	NW 1/4 NW 1/4 NE 1/4	14	03 S	11 W

Distance And Direction From Road Intersection

OJ-106,

Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 871.50 msl

1 OWNER OF WELL UPJOHN MONITORING WELL
Address
MI
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 164.0 FT. | Date Completed 09/05/90 | [x] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger/Bored [ ] Jetted [x] Unknown

6 USE [ ] Domestic [ ] Irrigation [x] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump [ ] _____

7 CASING: [ ] Steel [ ] Plastic [x] Threaded [ ] Welded
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Height: Above Surface 0.0 ft.
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
FINE SAND AND TOPSOIL, LITTLE SILT, TRACE	2	2
GRAVEL, MEDIUM & COARSE SAND		
FINE SAND FILL, LITTLE CLAY, TRACE SILT,	5	7
GRAVEL AND COARSE SAND		
CLAYEY FINE TO MEDIUM SAND CTRACE COARSE	7	14
SAND & GRAVEL		
SILTY CLAY, TRACE GRAVEL & SAND	4	18
FINE SAND, LITTLE SILT AND MEDIUM SAND	4	22
, TRACE CLAY, GRAVEL & COARSE SA		
FINE SAND	6	28
FINE TO MEDIUM SAND , LITTLE GRAVEL	19	47
& COARSE SAND ,TRACE SILT		
FINE TO MEDIUM SAND, LITTLE COARSE SAND	11	58
,TRACE SILT AND FINE GRAVEL		
FINE TO MEDIUM SAND , TRACE SILT	9	67
CLAYEY SILT, LITTLE TO SOME SAND , TRACE	1	68
FINE GRAVEL		
F INESAND , LITTLE MEDIUM SAND ,TRACE SILT	3	71
CLAYEY SILT, TRACE SAND	1	72
FINE SAND , TRACE SILT AND MEDIUM SAND	10	82

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 0.00
Mnfg 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Bronner Check [ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
0.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]Basement offset | [ ]12" above grade [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other_____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 0 ft. Direction
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
Type: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.
MW-101, MW-105, MW-106

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 2 of 2

C5

1 LOCATION OF WELL 397311142000 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	NW 1/4 NW 1/4 NE 1/4	14	03 S	11 W

Distance And Direction From Road Intersection

DJ-106,
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 871.50 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
MEDIUM TO COARSE SAND , LITTLE FINE SAND	12	94
, TRACE FINE GRAVEL		
FINE SAND , TRACE SILT, AND MEDIUM SAND	5	99
FINE TO MEDIUM SAND , LITTLE TO TRACE	38	137
GRAVEL , TRACE SILT AND COARSE SAN		
SILTY FINE SAND , TRACE CLAY AND MEDIUM SAND	6	143
SANDY SILT, SOME FINE SAND , TRACE MEDIUM	6	149
& FINE GRAVEL		
FINE TO MEDIUM SAND ,TRACE SILT	5	154
GRAVELLY FINE TO MEDIUM SAND , TRACE	5	159
SILT AND COARSE SAND		
FINE TO MEDIUM SAND , TRACE SILT, FINE	35	194
GRAVEL & COARSE SAND		
FINE SAND ,TRACE SILT AND COARSE SAND	5	199
MEDIUM TO COARSE SAND , SOME GRAVEL ,	10	209
LITTLE FINE SAND , TRACE SILT AND		
FINE TO MEDIUM SAND, LITTLE COARSE SAND	30	239
, TRACE SILT AND GRAVEL		
MEDIUM TO COARSE SAND , LITTLE GRAVEL,	7	246
TRACE SILT AND FINE S		

3 OWNER OF WELL DEQUINN MONITORING WELL
Address
MI
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 364.0 FT. | Date Completed 09/05/90 | [x] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger/Bored [ ] Jetted [x] Unknown

6 USE [ ] Domestic [ ] Public [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type II Public [ ] Heat Pump [x] Test Well [ ] Type IIb Public [ ] _____

7 CASING: [ ] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 0.0 ft.
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 0.00
Mnfg 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Brenner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
0.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [x] Yes From to ft.
[ ] Neat cement [x] Bentonite [ ] Other
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 0 ft. Direction
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.
MW-101, MW-105, MW-106

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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MICHIGAN DEPARTMENT OF PUBLIC HEALTH
WATER WELL AND PUMP RECORD

PERMIT NUMBER:

1 LOCATION OF WELL 397311136002 CG | Tax Parcel No.

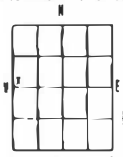
County	Township Name	Fraction	Section No.	Town No.	Range No.
KALAMAZOO	PORTAGE	SW 1/4 SW 1/4 NW 1/4	36	03 S	11 W

Distance and Direction From Road Intersection

3301 WOODHAMS, PORTAGE 49002
Street Address & City of Well Location

3 OWNER OF WELL: FRED OEHMICK
Address: 3301 WOODHAMS, PORTAGE, MI 49002
Address Same As Well Location? [x] Yes [ ] No

Locate with 'x' in Section Below — Sketch Map:



ELEVATION 860.00 asl

4 WELL DEPTH: 110.0 ft. | Date Completed: 06/25/85 | [ ] New Well [ ] Replacement Well

5 [x] Cable Tool [ ] Hollow rod | [ ] Rotary [ ] Auger/Bored | [ ] Driven [ ] Dug [ ] Jetted ____

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump [ ] _____

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 105.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BLACK DIRT & CLAY	6.0	6.0
FINE SAND	18.0	24.0
SAND & CLAY MIX	8.0	32.0
FINE SAND	18.0	50.0
COARSE SAND	30.0	80.0
BLUE CLAY	6.0	86.0
FINE SAND	10.0	96.0
COARSE SAND	14.0	110.0

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 3.00
SLOT 0.010 Length 5.0
Set between 105.00 ft. and 110.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Brenner Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
1.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
105 ft. after 1.0 hrs. pumping at 30 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] No [x] Yes From 0.0 to 20.0 ft.
[ ] Neat cement [ ] Bentonite [x] Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Sewer Distance 50 ft. Direction E
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [x] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name STANDARD
Model number HP .75 Volts
Length of Drop Pipe 60 ft. Capacity 19 G.P.M.
TYPE: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 18 Gallons

15 Remarks, elevation, source of data, etc.

Data Source: MDNR

17 Rig Operator's Name:

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.

FAITH WELL & PUMP COMPANY 1293
REGISTERED BUSINESS NAME REGISTRATION NO.

Address 2300 HICKORY ROAD BATTLE CREEK, MI 49017

Signed _____ Date _____
AUTHORIZED REPRESENTATIVE

AUTHORITY: Act 368 PA 1978 COMPLETION: Required PENALTY: Conviction of a violation of any provision is a misdemeanor

WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 39731031001 | C7 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PAVILLION	SE 1/4 SW 1/4 NW 1/4	31	03 S	10 W

Distance And Direction From Road Intersection
.25 MI. S. OF S AVE. .25 MI. E. OF SPRINKLE RD.
10405 SPRINKLE RD., KALAMAZOO 49001
Street Address & City of Well Location

3 OWNER OF WELL — LARRY FORSYTHE
Address — SPRINKLE RD.
KALAMAZOO, MI 49001
Address Same As Well Location? | | Yes | | No

Locate with 'X' in Section Below — Sketch Map

ELEVATION 862.00 msl

4 WELL DEPTH: 30.0 FT. | Date Completed 01/13/76 | | | New Well | | Replacement Well

5 | | Cable tool | | Rotary | | Driven | | Dug | | Hollow rod | | Auger/Bored | [x] Jetted | | | ____

6 USE [x]Domestic | |Irrigation | |Test Well | |Type I Public | |Type II Public | |Type IIb Public | |Type III Public | |Heat Pump | |_____

7 CASING: | | Steel [x] Threaded | | Plastic | | Welded
Height: Above Surface 1.0 ft.
Diameter
2.00 in. to 22.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe | | Yes [x] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND	3	3
RED CLAY & SAND	7	10
SAND & GRAVEL (FINE)	11	21
SAND & CLAY (BROWN)	4	25
CLAY (GRAY)	1	26
SAND (MEDIUM)(WATER BEARING)	4	30

8 SCREEN | | Not Installed
Type Stainless Steel Diameter 1.25
SLOT 0.010 Length 4.0
Set between 26.00 ft. and 30.00 ft.
FITTINGS: | |K-Packer | |Lead Packer [x]Bremmer Check | | Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
12.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
12 ft.after 0.5 hrs.pumping at 15 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter | |Basement offset | |12" above grade | |Approved pit

12 WELL GROUTED? [x]No | |Yes From to ft.
| |Neat cement | |Bentonite | |Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 55 ft. Direction N
Well disinfected upon completion? [x]Yes | |No
Was old well plugged? | |Yes | |No

14 PUMP: [x]Not Installed | |Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: | |Submersible | |Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 834

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 39741005013 | CB | tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	SW 1/4 NW 1/4 NW 1/4	05	04 S	10 W

Distance And Direction From Road Intersection
1000' N OF TU AVENUE AND 200' E OF 26TR
11171 S 26TH, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 867.00 msl

1 OWNER OF WELL ELLIS, REED
Address 2454 GROUSE CT
PORTAGE, MI 49002
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 90.0 FT. | Date Completed 10/27/88 | [x] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted ____

6 USE [x] Domestic [x] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump [ ] _____

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 86.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY & GRAVEL	30	30
GRAY CLAY & GRAVEL	25	55
BROWN CLAY & GRAVEL	15	70
WET MUDDY SAND & GRAVEL	13	83
COARSE SAND & GRAVEL	7	90

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.015 Length 4.0
Set between 86.00 ft. and 90.00 ft.
FITTINGS: [ ] K-Packer [ ] Bead Packer [ ] Bremner Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
20.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
20 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] No [x] Yes From to ft.
[ ] Neat cement [x] Bentonite [ ] Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 70 ft. Direction SW
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name STA RITE
Model number HP .5 Volts
Length of Drop Pipe 47 ft. capacity 14 G.P.M.
TYPE: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 14 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

0117
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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This is not a legal document.

WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 39741003002 | C9 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	SE 1/4 SW 1/4 SW 1/4	03	04 S	10 W

Distance And Direction From Road Intersection
2250' E OF 30TH AND 100' N OF H AVENUE
8171 U AVENUE, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 856.00 msl

3 OWNER OF WELL VALLAD, DOUGLAS
Address 8171 U AVENUE
VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 41.0 FT. | Date Completed 03/31/89 | [ ] New Well [ ] Replacement Well

5 [ ] Cable Tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger/Bored [ ] Jetted [x] Unknown

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND AND STONES	15	15
GRAY CLAY	18	33
WATER SAND	8	41

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded
Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 36.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Plastic/PVC Diameter 4.00
SLOT 0.012 Length 5.0
Set between 36.00 ft. and 41.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Drenmer Check [x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
12.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] No [x] Yes From to ft.
[ ] Neat cement [x] Bentonite [ ] Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP .5 Volts
Length of Drop Pipe 21 ft. capacity 10 G.P.M.
TYPE: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 10 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

0416
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

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1 LOCATION OF WELL 39701013001 | C\\ | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	NE 1/4 SE 1/4 NE 1/4	13	04 S	10 W

Distance And Direction From Road Intersection
1800' N OF VW AND 100' W OF 36TH
13334 S 36TH STREET, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 922.00 msl

3 OWNER OF WELL NEXTON, MICHAEL
Address 13334 S 36TH STREET
VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 117.0 FT. | Date Completed 04/18/77 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [x] Jetted [ ] _____

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump [ ] _____

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded
Diameter
2.00 in. to 113.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Height: Above Surface 0.0 ft.
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY	4	4
BROWN CLAY AND GRAVEL	24	28
BLUE CLAY	50	78
LIGHT COLORED GRAVEL	1	79
BROWN CLAY	2	81
BLUE CLAY AND GRAVEL	3	84
BROWN CLAY AND GRAVEL	3	87
STONES AND GRAVEL	13	100
LIGHT BROWN COARSE SAND & GRAVEL	17	117

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 1.25
SLOT 0.010 Length 4.0
Set between 113.00 ft. and 117.00 ft.
FITTINGS: [ ] K-Packer [ ] Road Packer [ ] Reamer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
40.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] No [x] Yes From to ft.
[ ] Neat cement [ ] Bentonite [x] Other_____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 56 ft. Direction W
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name F & M
Model number HP .75 Volts
Length of Drop pipe 63 ft. capacity 10 G.P.M.
TYPE: [ ] Submersible [x] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 10 Gallons

15. Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 0168

Address

Signed — Date

AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 39740918007 C12 Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	WAKESHMA	NE 1/4 NE 1/4 SE 1/4	18	04 S	09 W

Distance And Direction From Road Intersection
2400' N OF W AND 50' W OF 38TH
f. VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below Sketch Map

ELEVATION 910.00 msl

3 OWNER OF WELL FAIR, DICK
Address 13550 38TH STREET
VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 80.3 FT. | Date Completed 05/25/88 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[x] Hollow rod [ ] Auger/Bored [ ] Jetted [ ] _____

6 USE [x]Domestic [ ]Irrigation [ ]Test Well [ ]Type I Public [ ]Type II Public [ ]Type IIb Public [ ]Type III Public [ ]Heat Pump [ ]_____

7 CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 70.0 ft. depth
3.00 in. to 80.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 3.00
SLOT 0.015 Length 10.0
Set between 70.00 ft. and 80.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Drop Check [x] Blank above screen 5.0 ft. Other

9 STATIC WATER LEVEL:
12.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]12" above grade [ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 75 ft. Direction NW
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name FLINT AND
Model number HP 1 Volts
Length of Drop Pipe 42 ft. capacity 19 G.P.M.
TYPE: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 19 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY	18	18
GREY CLAY, SAND AND GRAVEL	10	28
BROWN CLAY, SAND AND GRAVEL	16	44
BROWN CLAY, STONES AND SAND AND GRAVEL	14	58
GREY CLAY, SAND AND GRAVEL	8	66
WATER SAND	14	80

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME 1576 REGISTRATION NO.

Address

Signed AUTHORIZED REPRESENTATIVE Date

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WATER WELL, AND PUMP RECORD

D1

Page 1 of 1

LOCATION OF WELL	Tax Parcel #
County: KALAMAZOO	Township Name: TEXAS
Direction: SW 1/4 NW 1/4 NW 1/4	Section: 15
Town: 01 S	Range: 12 W

Distance and Direction from Nearest Intersection
1366' S OF & AND 206' E OF 6TH
7129 6TH STREET, KALAMAZOO 49009
Street Address (or city of well location)

Locate with "X" in Section Below — Sketch Map

ELEVATION 743.00 msl

1 OWNER OF WELL: SCOTT FEE, MIKE
Address: 54 GAL ST.
SOUTH HAVEN, MI 49090
Address of Well Location (if different from above)

3 WELL DEPTH: 133.0 Ft. | Date Completed: 12/2/2005 | [ ] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Jetted [ ] Other

6 USE [x]Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type III Public [ ] _____

7 CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 120.0 ft. Depth
1.00 in. to 133.0 ft. Depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. Depth
0.00 in. to 0.0 ft. Depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 1.00
Slot 0.010 Length 5.0
Set between 128.00 ft. and 133.00 ft.
FITTINGS: [ ]S-Packer [ ]Bead Packer [ ]Prepacker shoe
[ ] Blank above screen 0.0 ft. other

9 STATIC WATER LEVEL:
95.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Well vented [x]Bentonite [ ]Other
[ ]Pitless unit [ ]Approved pit
No. of bags of cement Additives

12 WELL GROUTED? [ ]Yes [x]No From to ft.
[ ]Neat cement [x]Bentonite [ ]Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type None Distance 0 ft. Direction
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name PEDROLLO
Model number HF 1.5 Volts
Length of Drop Pipe 110 ft. Capacity 10 G.P.M.
TYPE: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 10 Gallons

2 FORMATION DESCRIPTION	THICKNESS of STRATUM	DEPTH TO BOTTOM of STRATUM
MED BR CLAY*	20	20
MED BR SAND	15	35
BR CLAY AND SAND	10	45
GRAVEL	5	50
BR SAND & CLAY	30	80
STONE- MED BR GRAVEL	20	100
MED BR GRAVEL	33	133

15. Remarks, elevation, source of data, etc.

Data Source: MDNR

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.

1794
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

17. Pump Operator's Name:

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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 07811214011 | D2 | Tax Parcel #

County: KALAMAZOO | Township Name: TEXAS | Fraction: NE 1/4 SE 1/4 SE 1/4 | Section: 14 | Town: 03 S | Range: 12 W

Distance And Direction From Road Intersection
396' W OF 10TH 100' S OF KEITH CT
6124 KEITH CT, KALAMAZOO 49009
Street Address & City, if Well Location

Locate with "X" in Section Below — Sketch Map

ELEVATION 910.00 est

1 OWNER OF WELL: SCOTT, MARY ELLEN
Address: 396 S. CEDAR
KALAMAZOO, MI 49009
Address Same As Well Location: [ ] Yes [x] No

4 WELL DEPTH: 104.0 FT. | Date Completed: 12/10/97 | [x] New Well [ ] Replacement Well

[x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 NSF [ ]% mastic [ ] Type I Public [ ] Type II Public
[ ] Chromium [ ] Type II Public [ ] Heat Pump
[ ] West Well [ ] Type IIb Public [ ]

7 CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Diameter
4.00 in. to 100.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Full Wall Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight: Alloy Surface 1.0 ft.
Weight _ lbs/ft.
Drive Shoe [x] Yes [ ] No

2 FORMATION DESCRIPTION

	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	45	45
MUDDY SAND	15	60
COARSE SAND & GRAVEL	15	75
SAND MUDDY WATER BEARING	3	78
COARSE SAND	22	96
COARSE SAND & GRAVEL	8	104

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.015 Length 4.0
Set between 100.00 ft. and 104.00 ft.
FITTINGS: [ ] Packer [ ] Bead Packer [ ] Bronner check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
45.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
65 ft. after 1.0 hrs. pumping at 50 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [x] Pitless adapter [ ] 12" above grade
[ ] Pitless unit [ ] Approved pit
[ ] Diverted offset

12 WELL GROUTED: [ ] No [x] Yes From to ft.
[ ] Neat cement [x] Bentonite [ ] Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type: Septic Distance: 100 ft. Direction: S
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation only
Manufacturer's name: STARLITE
Model number HP .5 Volts
Length of Drop Pipe 60 ft. Capacity 14 G.P.M.
Type: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity 16 Gallons

15. Remarks, elevation, source of data, etc.

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.

0112
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

17. Registered's Name:

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WATER WELL AND PUMP RECORD

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1 LOCATION OF WELL 1971224086 103

Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	TEXAS	SW 1/4 SW 1/4 NE 1/4	24	03 S	12 W

Distance And Direction From Road Intersection

I-75 COLONY LANE, KALAMAZOO 49009
Street Address & City of Well Location

Locate with "X" in section Below Sketch Map

ELEVATION 907.00 msl

# FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
COARSE SAND & GRAVEL	25	25
SAND & GRAVEL (WATER)	74	99
HARD GRAY CLAY AND GRAVEL	41	140
COARSE SAND	8	148

3 OWNER OF WELL AMERICAN VILLAGE BLDR.
Address 4314 WEST CENTRE
KALAMAZOO, MI 49002
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 148.0 FT. | Date Completed 03/11/88 | [ ] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [x]Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[ ]Test Well [ ]Type IIB Public [ ]

7 CASING: [x] Steel [x] Threaded | Height: Above Surface 1.0 ft.
[ ] Plastic [ ] Welded
Diameter
4.00 in. to 142.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
SLOT 0.010 Length 6.0
Set between 142.00 ft. and 148.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Bremmer Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
25.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
25 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From ft.
[ ]Neat cement [x]Bentonite [ ]Other
No. of bags of cement ___ Additives ___

13 Nearest source of possible contamination
Type Sewer Distance 0 ft. Direction
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name STA RITE
Model number HP 1 Volts
Length of Drop Pipe 63 ft. capacity 20 G.P.M.
TYPE: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number capacity 20 Gallons

15 Remarks, elevation, source of data, etc.
PERMIT 7071

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO. 0112

Address

Signed AUTHORIZED REPRESENTATIVE Date

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WATER WELL AND PUMP RECORD

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1 LOCATION OF WELL 39?:1120:00 104 Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PORTAGE	SW 1/4 SE 1/4 SE 1/4	2?	03 S	11 W

Distance And Direction From Road Intersection
JUST SOUTH OF PORTAGE CREEK 150' W OF OAKLAND DR
2917 OAKLAND DR, KALAMAZOO
Street Address & City of Well Location

Locate with "X" in Section Below — Sketch Map

ELEVATION 853.00 msl

2 OWNER OF WELL WILKINS AND WHEATON
Address 1?? PORTAGE ST
KALAMAZOO, MI 49007
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 150.0 FT. | Date Completed 10/24/?0 | [x] New Well [ ] Replacement Well

5 [ ] Cable Tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger/Bored [ ] Jetted [x] Unknown

6 USE [ ] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type II Public [ ] Heat Pump [ ] Test Well [ ] Type IIb Public [x] Monitor Well

Formation Description	Thickness of Stratum	Depth to Bottom of Stratum
LIGHT BROWN FINE SAND, SOME BLACK ORGANICS	1	1
LIGHT BROWN FINE SAND TO MEDIUM SAND	27	28
BROWN FINE TO MEDIUM SAND, TRACE GRAVEL	3	31
GREYISH BROWN MEDIUM TO COARSE SAND, TRACE GRAVEL	6	37
GREYISH BROWN FINE TO MEDIUM SAND, TRACE SILT, TRACE GRAVEL	[illegible]	[illegible]
GREYISH MEDIUM TO COARSE SAND	[illegible]	[illegible]
GREYISH BROWN FINE TO MEDIUM SAND, TRACE ORGANICS, TRACE 1-2MM COBBLES	[illegible]	[illegible]
BROWN FINE TO MEDIUM SAND, SOME SILT	5	92
BROWN CLAY WITH SOME COARSE BROWN SAND	5	97
BROWN FINE TO MEDIUM SAND, SOME SILT, TRACE CLAY, TRACE GRAVEL	20	117
BROWN FINE TO MEDIUM SAND, TRACE SILT	[illegible]	11[illegible]
GREYISH FINE TO MEDIUM SILTY SAND	[illegible]	150

7 CASING: [ ] Steel [ ] Threaded [ ] Plastic [ ] Welded | Height: Above Surface 0.0 ft.
Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth | Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth | Drive Shoe [ ] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Unknown Diameter 0.00
Slot 0.000 Length 3.0
Set between 147.00 ft. and 150.0 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bronze Check
[ ] Blank above screen 0.0 ft.

9 STATIC WATER LEVEL:
4.50 ft. below land surface [ ] Flow

10 PUMPING LEVEL below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [ ] 12" above grade [ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity 0 Gallons

15 Remarks, elevation, source of data, etc.
MW-150

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed AUTHORIZED REPRESENTATIVE Date

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This is not a legal document.

WATER WELL AND PUMP RECORD

1 LOCATION OF WELL 39741103002 | DS

Tax Parcel #

County: KALAMAZOO | Township Name: SCHOOLCRAFT | Fraction: NE 1/4 NE 1/4 NE 1/4 | Section: 01 | Town: 04 S | Range: 11 W

Distance And Direction From Road Intersection:
350'W OF PORTAGE AND 150 S OF T
11032 EAST GOURDNECK LK. DR., SCHOOLCRAFT 49087
Street Address & City of Well Location

Locate with "X" in Section Below — Sketch Map

ELEVATION: 875.00 msl

OWNER OF WELL: MENTHER, JON
Address: 11032 EAST GOURDNECK LK. DR.
SCHOOLCRAFT, MI 49087
Address Same As Well Location? [x] Yes [ ] No

3 WELL DEPTH: 100.0 FT. | Date Completed 03/05/83 | [ ] New Well [ ] Replacement Well

[x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

USE [x] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [ ]

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY & SAND	8	8
SAND & GRAVEL (WET)	66	74
GRAY CLAY & GRAVEL	11	85
COARSE SAND	15	100

CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded | Height: Above Surface 1.0 ft.
Diameter:
4.00 in. to 96.0 ft. depth
0.00 in. to 0.0 ft. depth | Weight ___ lbs/ft.
Borehole Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.012 Length 4.0
Set between 96.00 ft. and 100.00 ft.
FITTINGS [ ] K-Packer [ ] Lead Packer [ ] Bumper Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
999.99 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 1.0 hrs. pumping at 50 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [x] Yes From to ft.

No. of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Septic Distance 60 ft. Direction S
Well disinfected upon completion? [x] Yes [ ] No
Abandoned well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation only
Manufacturer's name
Model number HP .5 Volts
Length of Drop Pipe 21 ft. capacity 14 G.P.M.
TYPE: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity 14 Gallons

15 Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION No.

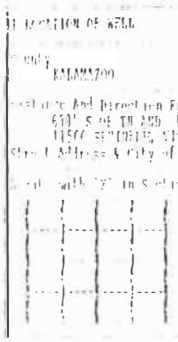
Address

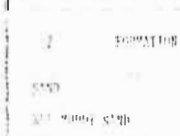
Signed AUTHORIZED REPRESENTATIVE Date

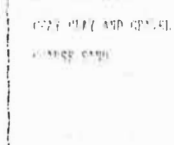
This is an MDNR computer generated facsimile of a water well record submitted under PA 368 of 1978.
This is not a legal document.

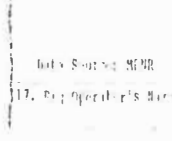
WATER WELL AND PUMP RECORD

D6









This is an HWRI computer generated facsimile of a water well record submitted under RA 173 of 1972.

Page 1 of 1

D7

1 LOCATION OF WELL 39741000404

Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	SW 1/4 NW 1/4 NE 1/4	09	04 S	10 W

Distance And Direction From Road Intersection:
150' E OF 29TH AND 100' S OF U
29TH AND U AVENUE, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below

Sketch Map

ELEVATION 851.00 msl

3 OWNER OF WELL NAZARENE CHURCH
Address 29TH AND U AVENUE
VICKSBURG MI 49097
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: Date Completed [ ] New Well
131.0 FT. 10/15/81 [ ] Replacement Well

5 [ ] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [x] Jetted [ ]

6 USE [ ]Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[ ]Test Well [ ]Type IIb Public [x]Other Public

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	27	27
SAND & CLAY	71	130
SAND	4	104

7 CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 1.0 ft.
Diameter
2.00 in. to 101.0 ft. depth
1.25 in. to 104.0 ft. depth
Weight lbs/ft.
Borehole Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 1.25
Slot 0.010 Length 3.0
Set between 101.00 ft. and 104.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Bremmer sleeve
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
[illegible] ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED: [ ]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other
No. of Bags of cement Additives:

13 Nearest source of possible contamination
Type Septic Distance 75 ft. Direction SW
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [x]Not Installed [ ]Pump Installation only
Manufacturer's Name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturer's Name
Model number Capacity 0 Gallons

15 Remarks, elevation, source of data, etc.

Data Source: MDPH

17. Rig Operator's Name:

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.

6067
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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This is not a legal document.

WATER WELL AND PUMP RECORD

page 1 of 1

108

1 LOCATION OF WELL 39741e11001

Tax Parcel #

County: KALAMAZOO | Township Name: BRADY | Fraction: SW 1/4 SW 1/4 SW 1/4 | Section: 14 | Town: 04 S | Range: 10 W

Distance And Direction From Road Intersection
390' E of 12TH AND 125' N of W
9845 W AVENUE, VICKSBURG 49097
Street Address & City of Well Location

Locate with "X" in Section Below — Sketch Map

ELEVATION: 365.00 msl

3 OWNER OF WELL: MORRIS, PHYLLIS
Address: 11324 W AVENUE
VICKSBURG, MI 49097
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 81.0 FT. | Date Completed: 03/23/83 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [x] Auger/Bored [ ] Jetted [ ]

6 USE [x]Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[ ]Test Well [ ]Type IIb Public [ ]

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
RED CLAY	10	10
GRAY GRAVEL	15	25
BLUE CLAY	40	65
CLAY & SA ND	10	75
GRAY SAND	6	81

7 CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 1.0 ft.
Diameter
2.00 in. to 77.0 ft. depth
1.25 in. to 81.0 ft. depth
Weight lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 1.25
Slot 0.012 Length 4.0
Set between 77.00 ft. and 81.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [x]Bremmer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
18.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Septic Distance 55 ft. Direction NW
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name L & D
Model number HP .5 Volts
Length of Drop Pipe 21 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

1734

REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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This is not a legal document.

WATER WELL AND PUMP RECORD

LOCATION OF WELL: D9

County: KALAMAZOO | Township Name: BRADY | Location: SE 1/4 SE 1/4 SE 1/4 | Section: 13 | Town: 04 S | Range: 10 W

Distance And Direction From Road Intersection
400' N OF 26TH AND 10' W OF M
& M AVENUE, PLAINSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below

Sketch Map

ELEVATION 900.00 msl

OWNER OF WELL: U.S. GEOLOGICAL SURVEY
Address: DENVER, CO
Address Same As Well Location? [ ] Yes [x] No

WELL DEPTH: 114.0 Ft. | Date Completed: 01/11/87 | [x] New Well [ ] Replacement Well

[x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

USE [1]Domestic [4]Type I Public [7]Type III Public
[2]Irrigation [5]Type II Public [8]Heat Pump
[x]Test Well [6]Type IV Public [ ]

CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 2.0 ft.
Diameter
4.00 in. to 110.0 ft. depth
5.66 in. to 0.0 ft. depth
Weight lbs/ft.
Drive Shoe [x] Yes [ ] No
Created Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.010 Length 4.0
Set between 110.00 ft. and 114.00 ft.
Fittings: [ ]K-Packer [ ]Dead Packer [ ]Drive Shoe Check
[x] Blank above screen 1.0 ft. Other

STATIC WATER LEVEL:
42.00 ft. below land surface [ ] Flow

PUMPING LEVEL: below land surface
92 ft. after 1.0 hrs. pumping at 50 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

WELL HEAD COMPLETION: [ ]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

GROUTED? [ ]Yes [x]No From 0 ft. To ft.
[ ]Neat cement [ ]Bentonite [ ]Other
No. of Bags of cement Additives

Nearest source of possible contamination
Type Septic Distance 900 ft. Direction W
Well disinfected upon completion? [ ]Yes [x]No
Was soil well plugged? [ ]Yes [ ]No

PUMP: [x]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M.
Type: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity Gallons

FORMATION DESCRIPTION	THICKNESS OF STRATA	DEPTH (Feet) Bottom of Stratum
HARD BROWN CLAY AND SAND	5	5
COARSE SAND & GRAVEL	5	10
COARSE GRAVEL & HARD GRAY CLAY	10	20
HARD GRAY CLAY AND GRAVEL	10	30
HARD GRAY CLAY AND GRAVEL	10	40
VERY HARD GRAY CLAY AND GRAVEL	10	50
HARD GRAY CLAY AND GRAVEL	10	60
HARD GRAY CLAY AND GRAVEL	10	70
HARD GRAY CLAY AND GRAVEL	10	80
HARD GRAY CLAY AND SOME GRAVEL	10	90
SOFT GRAY CLAY	10	100
COARSE SAND AND SOME GRAY CLAY	10	110
COARSE SAND(WATER BEARING)	4	114

Remarks, elevation, source of data, etc.

Data Source: MPMP

Well operator's name

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.

0112
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 39721226107 | E1

Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	TEXAS	SW 1/4 SW 1/4 NE 1/4	26	03 S	12 W

Distance And Direction From Road Intersection
67' S of PS AND 60' E of 6TH
PS AVENUE, KALAMAZOO (com)
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 915.60 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	1	1
MEDIUM SAND AND GRAVEL MUDDY	16	17
MEDIUM SAND WITH LITTLE GRAVEL	30	47
CEMENTED SAND AND LITTLE CLAY	5	52
FINE SAND	25	77
MEDIUM SAND AND GRAVEL	41	118
MEDIUM SAND	10	128
GRAY CLAY WITH LITTLE GRAVEL	33	161
COARSE SAND AND GRAVEL	6	167
FINE MUDDY SAND AND GRAVEL	17	[illegible]
MEDIUM SAND	2	[illegible]
COARSE SAND AND GRAVEL	[illegible]	[illegible]
GRAY CLAY WITH SAND AND GRAVEL	31	216
FINE SAND	[illegible]	231
GREY CLAY WITH SAND	10	241
SALT GREY AND CLAY	[illegible]	[illegible]
TILL	[illegible]	[illegible]

3 OWNER OF WELL U.S.G.S.
Address

Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 371.0 FT. | Date Completed 10/23/95 | [ ] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [ ] Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[x]Test Well [ ]Type IIb Public [ ]

7 CASING: [x] Steel [ ] Threaded | Height: Above
[ ] Plastic [ ] Welded | Surface 0.0 ft.
Diameter
1.00 in. to 0.0 ft. Depth | Weight lbs/ft.
0.00 in. to 0.0 ft. Depth
Grouted Drill Hole Diameter: | Drive Shoe [ ] Yes
0.00 in. to 0.0 ft. Depth | [ ] No
0.00 in. to 0.0 ft. Depth

8 SCREEN [ ] Not Installed
Type Unknown Diameter 0.00
Slot 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Bremmer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
28.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15 Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

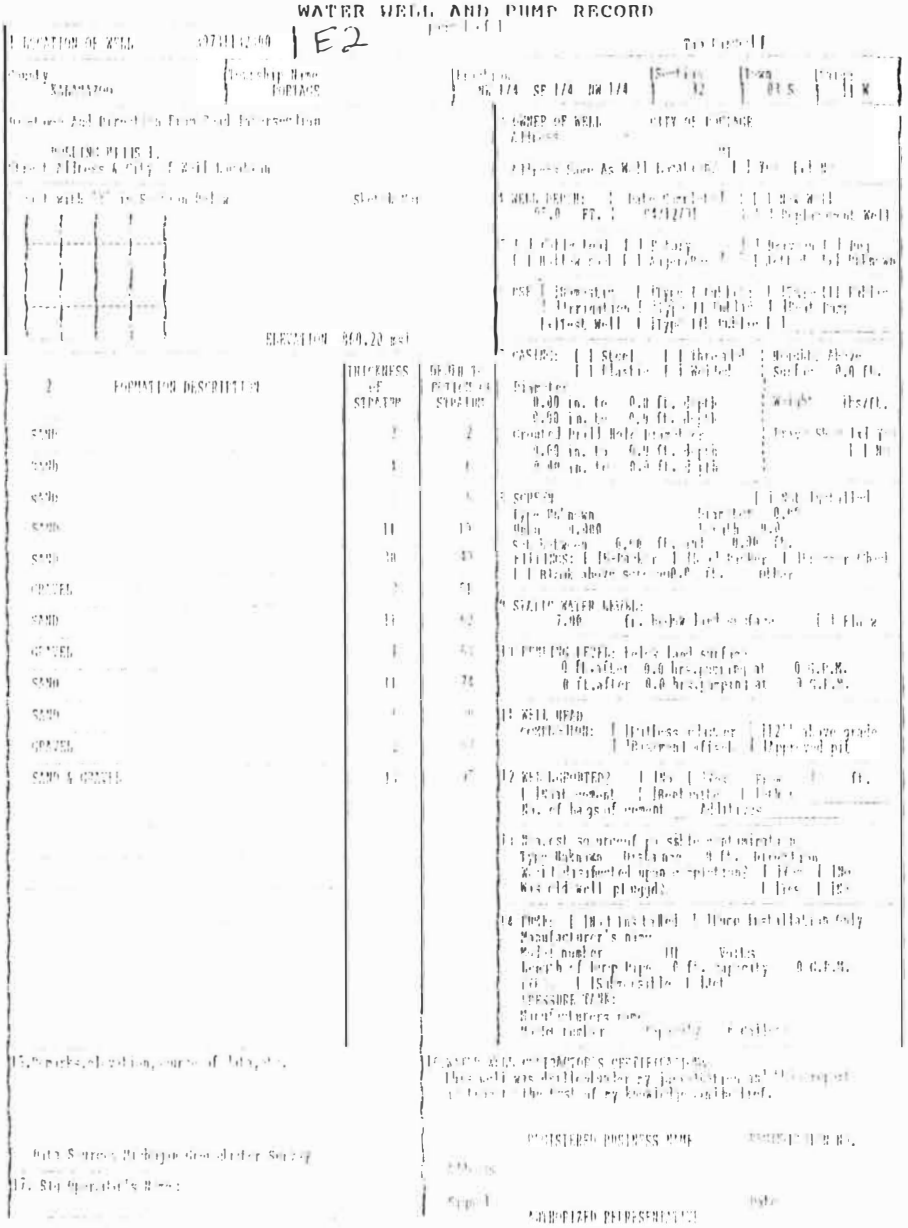
REGISTERED BUSINESS NAME REGISTRATION NO.

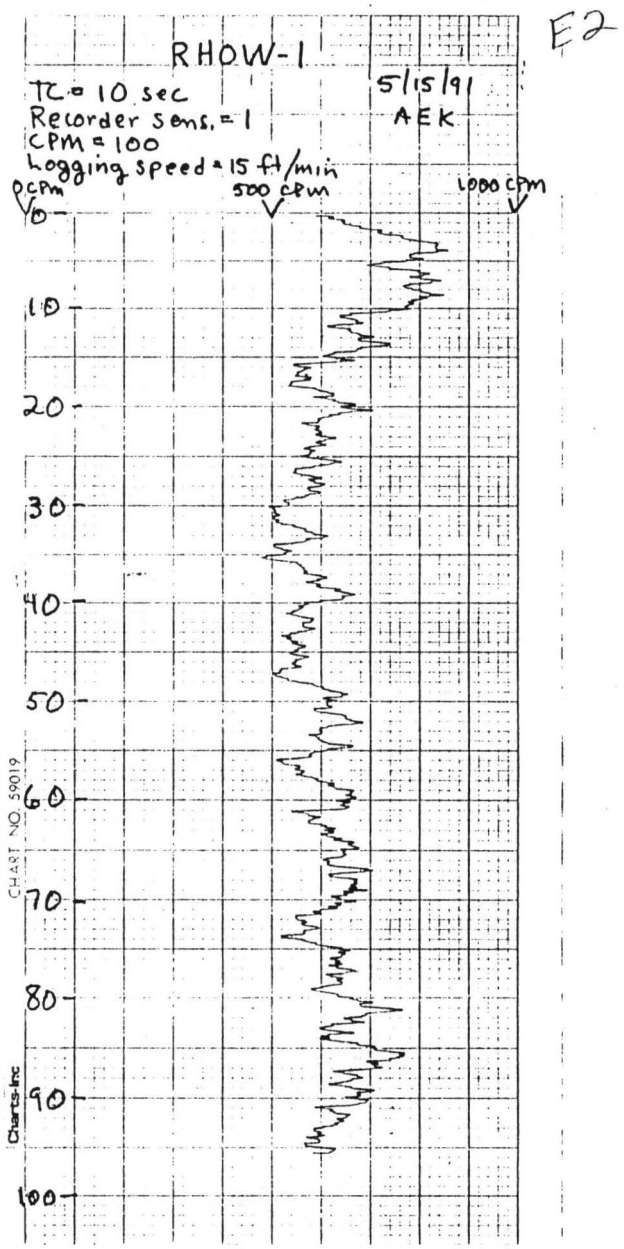
Address

Signed AUTHORIZED REPRESENTATIVE Date

This is an MDNR computer generated facsimile of a water well record submitted under PA 368 of 1978.
[illegible]

WATER WELL AND PUMP RECORD

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E2
TC = 10 sec
Recorder sens. = 1
CPM = 100
Logging speed = 15 ft/min
5/15/91
AEK
0 cpm
500 cpm
1000 cpm
0
10
20
30
40
50
60
70
80
90
100
CHART NO. 59019
Charts-Inc

WATER WELL AND PUMP RECORD

E3

1 LOCATION OF WELL — Tax Parcel #

County: — Township Name: SCHOOLCRAFT — Direction: SE 1/4 SE 1/4 SW 1/4 — Section: 04 — T or R: 04 S — Range: 11 W

Distance And Direction From Road Intersection
2700' W OF INTERSTATE AND 660' S OF U
U AVENUE, SCHOOLCRAFT TWP
Street Address if City of Well Location

Locate with "X" in Section Below — Sketch Map

ELEVATION 870.00 +-1

3 OWNER OF WELL: U.S. GEOLOGICAL SURVEY
Address: LANSING MI
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 190.0 FT. | Date Completed: 07/11/69 | [ ] New Well [ ] Replacement Well

5 [ ] Cable Tool [x] Rotary [ ] Driven [ ] Dug [ ] Bored [ ] Jetted [ ] Hollow Rod [ ] Augered/Bored

6 USE [ ] Domestic [ ] Type I Public [ ] Type III Public [ ] Irrigation [ ] Type II Public [ ] Other Type [ ] Test Well [ ] Type IV Public [x] Monitor Well

7 CASING: [x] Steel [ ] Threaded [ ] Plastic [ ] Welded — Weight: Above Surface 2.5 ft.
Diameter
4.0 0 in. to 190.0 ft. Depth — Weight __ lbs/ft.
0.0 0 in. to 0.0 ft. Depth
Grouted Drill Hole Diameter — Drive Shoe [ ] Yes [x] No
0.00 in. to 0.0 ft. Depth
0.00 in. to 0.0 ft. Depth

8 SCREEN [ ] Not Installed
Type Stainless Steel — Diameter 4.06
Slot 0.020 — Length 10.0
Set between 180.0 0 ft. and 190.00 ft.
FITTINGS: [ ] K-Packer [ ] Bead Packer [ ] Retainer Check [ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
10.15 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [x] 12" above grade [ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [x] Yes [ ] No — From 0 to 0 ft.
[ ] Neat cement [ ] Bent mix [ ] Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Septic — Distance 400 ft. — Direction W
Well disinfected upon completion? [ ] Yes [x] No
Was old well plugged [ ] Yes [ ] No

14 PUMP: [x] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number — HP — Volts
Length of Drop Pipe 0 Ft. — Capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number — Capacity 0 Gallons

2 FORMATION DESCRIPTIONS

FORMATION DESCRIPTIONS	THICKNESS OF STRATA	DEPTH TO BOTTOM OF STRATUM
GRAVEL, SOME FILL	5	5
GRAVEL, MED. A LITTLE SAND MED TO FINE	11	16
BOULDER AT 43 FT		
CLAY, GRAY, STONY	6	22
CLAY, GRAY, A LITTLE GRAVEL	11	33
SAND, FINE	7	40
GRAVEL FINE TO MED	97	137
GRAVEL, MED TO COARSE	8	145
GRAVEL, FINE TO MEDIUM A LITTLE SAND	5	150
GRAVEL, FINE A LITTLE SAND MED TO FINE	17	175
GRAVEL, FINE A LITTLE SAND, BOULDER AT 177	27	202
GRAVEL, MED. W/FLECKS OF BLACK SHALE, SOFT	3	205

15 Remarks, elevation, source of data, etc.

Data Source: USGS

17 Well Operator's Name:

18 WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

(USGS)
REGISTERED BUSINESS NAME

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

This is an USGS computer generated facsimile of a water well record submitted under LA 168 of 1939.
This is not a legal document.

WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 39741101010 | E4

Tax Parcel #

County: KALAMAZOO | Township Name: SCHOOLCRAFT | Fraction: S 1/4 SW 1/4 SW 1/4 | Section: 01 | Town: 04 S | Range: 11 W

Distance And Direction from Road Intersection:
2100'W OF 23 AND 230'N OF U
3184 E U AVE, SCHOOLCRAFT 49087
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 868.00 msl

3 OWNER OF WELL: PERRY III
Address: 4422 WESTFIELD
KALAMAZOO, MI 49007
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 71.0 ft. | Date Completed: 02/20/88 | [ ] New Well [ ] Replacement Well

[x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

USE [x] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [ ]

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
DRY SAND	15	[illegible]
WET SAND	25	40
SOFT GRAY CLAY	27	67
COARSE SAND	4	71

7 CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 1.0 ft.
Diameter:
4.00 in. to 57.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight lbs/ft.
Drive Shoe [x] Yes [ ] No
Reamed Drill Hole Diameter:
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.015 Length 4.0
Set between 57.00 ft. and 61.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Bremer Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL below land surface
15 ft. after 1.0 hrs. pumping at [illegible] G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED: [ ]No [x]Yes From [illegible] ft.

No. of bags of cement ___ Additives ___

13 Nearest source of possible contamination
Type Septic Distance 15 ft. Direction S
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Temp Installation Only
Manufacturer's name
Model number HP .5 Volts
Length of Drop Pipe 42 ft. capacity 14 G.P.M.
Type: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity 14 Gallons

15 Remarks, elevation, source of data, etc.

Data Source: MGSB

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME REGISTRATION NO. 0112

Address

Signed AUTHORIZED REPRESENTATIVE Date

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This is not a legal document.

WATER WELL AND PUMP RECORD

1 LOCATION OF WELL 1???1007001 IES Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	SE 1/4 SE 1/4 NW 1/4	07	4 S	10 W

Distance And Direction From Road Intersection
700' E OF SPRINGLE AND 100' N OF W
5391 W AVENUE, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 859.00 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY & GRAVEL	25	25
WET SAND AND GRAVEL	15	40
GRAY CLAY & GRAVEL	10	50
WET MUDDY SAND	5	55
GRAY CLAY & GRAVEL	5	60
WET MUDDY SAND	[illegible]	[illegible]
HARD GRAY CLAY	[illegible]	[illegible]

3 OWNER OF WELL
Address 5391 W AVENUE
VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 160.0 FT. — Date Completed 03/09/?? — [ ] New Well [x] Replacement Well

5 [x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [x]Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[ ]Test Well [ ]Type IIb Public [ ]

7 CASING: [x] Steel [x] Threaded | Height: Above Surface 1.0 ft.
[ ] Plastic [ ] Welded
Diameter
4.00 in. to 160.0 ft. depth | Weight lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [x] Not Installed
Type None Diameter 0.00
Make 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Bremner Check
[ ] Blank above screen 0.0 ft. other

9 STATIC WATER LEVEL:
???.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [ ]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED [ ]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [x]Yes [ ]No

14 PUMP: [x]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15 Remarks,elevation,source of data,etc.

Data Source: MDNR

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.

0112
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

17. Rig Operator's Name:

This is an MDNR computer generated facsimile of an [illegible] well record submitted under [illegible] of 1976. [illegible]

WATER WELL AND PUMP RECORD

E6

Tax Parcel #

Distance And Direction From Road Intersection
269' W OF 2510 ADD 168' S OF W
6312 V AVENUE, VICKSBURG 49097
Street Address & City of Well Location

OWNER OF WELL: MDOT
Address: 6312 V AVENUE
VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

Locate with "X" in Section Below

ELEVATION: 845.00 msl

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
CLAY (BROWN)	8	8
MEDIUM SAND	32	40
SAND (GRAVEL	40	80
CLAY (GRAVEL	20	100
GRAY CLAY(HARD)	50	150

WELL DEPTH: 150.0 FT. | Date Completed: 09/00/86 | [ ] New Well [ ] Replacement Well

[ ] Cable Tool [x] Rotary [ ] Driven [ ] Dug
[ ] Boring [ ] Air/Mud [ ] Jetted

USE: [ ] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type III Public [ ] Unknown

CASING: [x] Steel [ ] Threaded [ ] Welded [ ] Plastic
Height: Above Surface 0.0 ft.
Diameter
4.00 in. to 95.0 ft. depth
6.00 in. to 0.0 ft. depth
Grouted? [ ] Yes [ ] No
Drive Shoe? [ ] Yes [ ] No
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight: lbs/ft.

SCREEN [ ] Not Installed
Type Unknown
Diameter 0.00
Slot 0.000
Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ] Stainless [ ] Brass [ ] Galvanized
[ ] Blank above screen 0.0 ft. [ ] Other

STATIC WATER LEVEL:
0.00 ft. below land surface [ ] Flow

PUMPING LEVEL: below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

WELLHEAD COMPLETION: [ ] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

WELL GROUTED: [ ] No Grout ft. to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement Additives

Nearest Source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M. T.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity Gallons

Data Source: MDOT

17. Rig Operator's Name:

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.

3107
REGISTERED BUSINESS NAME REGISTRY NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 0741015007 | E7 Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	SW 1/4 SE 1/4 SW 1/4	15	04 S	10 W

Distance And Direction From Road Intersection
300' [illegible] 31ST AND [illegible] W OF W
W AVENUE, VICKSBURG, 49097
Street Address & City of Well Location

Locate with "X" in Section Below Sketch Map

ELEVATION 855.00 [illegible]

3 OWNER OF WELL FRITZ, JOHN
Address P.O. BOX 109
[illegible] MI 49052
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 136.0 FT. | Date Completed 12/00/80 | [ ] New Well [ ] Replacement Well

5 [ ] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [x] Jetted [ ]

6 USE [ ] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[x] Test Well [ ] Type IIb Public [ ]

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
DIRT, SAND AND LITTLE CLAY	9	9
SAND & GRAVEL	11	20
CLAY, SAND, AND GRAVEL	7	27
LITTLE CLAY, SAND AND GRAVEL	[illegible]	[illegible]
TRACE OF CLAY, SAND GRAVEL	11	[illegible]
GRAVEL	[illegible]	50
CLAY, SAND, LITTLE GRAVEL	[illegible]	55
CLAY, SAND, GRAVEL	[illegible]	67
CLAY, SAND	5	72
CLAY, SAND AND GRAVEL	12	84
CLAY, SAND	10	94
SAND	[illegible]	99
SAND AND LITTLE GRAVEL	5	104
GRAVEL	10	114
GRAVEL	6	120
SAND	1	121
BEDROCK	15	136

7 CASING: [x] Steel [x] Threaded | Height: Above Surface 0.0 ft.
[ ] Plastic [ ] Welded
Diameter
2.00 in. to 136.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [x] Not Installed
Type None Diameter 0.00
Slot 0.000 Length 0.0
Set between 0.00 ft. and 0.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bronze check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
0.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [x] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [x] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15. Remarks, elevation, source of data, etc.

Data Source: MGSB

17. Rig Operator's Name:

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.

0169
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed AUTHORIZED REPRESENTATIVE Date

This is an MDPH computer generated facsimile of a water well record submitted under PA 368 of 1978.
[illegible]

WATER WELL AND PUMP RECORD

E8

1 LOCATION OF WELL [illegible]

County: KALAMAZOO [illegible] | Township Name: [illegible] | Fraction: [illegible] 1/4 [illegible] 1/4 [illegible] 1/4 | Section: [illegible] | Town: 04 S | Range: [illegible] W

Distance And Direction From Road Intersection
[illegible]
[illegible] W AVENUE, VICKSBURG [illegible]
Street Address & City of Well Location

Locate with "X" in Section Below — Sketch Map

ELEVATION: 885.00 msl

2 OWNER OF WELL: [illegible]
Address: [illegible] W AVENUE
VICKSBURG, MI [illegible]
Address Same As Well Location? [ ] Yes [ ] No

3 WELL DEPTH: [illegible] ft. | Date Completed: [illegible] | [ ] New Well | [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE: [ ] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type III Public [ ]

4 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
RED LOAMY SAND	10	10
RED CLAY AND SAND	20	[illegible]
FINE TO GRAVEL	[illegible]	[illegible]
[illegible] GRAY SAND	[illegible]	[illegible]
GRAY CLAY AND SAND	[illegible]	[illegible]
[illegible] SAND	[illegible]	[illegible]

7 CASING: [ ] Steel [ ] Threaded | Height: Above Surface 1.0 ft.
[ ] Plastic [ ] Welded
Diameter:
[illegible] in. to 14?.0 ft. depth | Weight [illegible] lbs/ft.
[illegible] in. to 151.0 ft. depth
Drill Hole Diameter | Drive Shoe [ ] Yes [ ] No
[illegible] in. to [illegible] ft. depth
[illegible] in. to [illegible] ft. depth

8 SCREEN: [ ] Not Installed
Type: [illegible] | Diameter: [illegible]
Slot: [illegible] | Length: [illegible]
Set between [illegible] ft. and [illegible] ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bremer Check
[ ] Blank above screen [illegible] ft. [ ] Other

9 STATIC WATER LEVEL:
25.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
[illegible] ft. after [illegible] hrs. pumping at [illegible] G.P.M.
[illegible] ft. after [illegible] hrs. pumping at [illegible] G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From [illegible] to [illegible] ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement ___ Additives ___

13 Nearest source of possible contamination
Type Septic | Distance 60 ft. | Direction SW
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name F & W
Model number [illegible] HP .5 Volts [illegible]
Length of Drop Pipe [illegible] ft. capacity [illegible] G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity [illegible] Gallons

15 Remarks, elevation, source of data, etc.

Data Source: [illegible]

17. Pump Installer's Name:

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.

[illegible]
REGISTERED BUSINESS NAME — REGISTRATION NO.

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

This is an MGSP computer generated facsimile of a water well record submitted under Act [illegible] of [illegible].
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WATER WELL AND PUMP RECORD

page 1 of 2

F1

1 LOCATION OF WELL 39741204100 | Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PRAIRIE RONDE	SE 1/4 NE 1/4 NW 1/4	04	04 S	12 W

Distance And Direction From Road Intersection
PAW PAW LAKE RD. 1/4 MILE EAST OF 4TH ST. ON N. SIDE OF
WELL SA-1,
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 909.00 msl

1 OWNER OF WELL — GEOLOGY DEPT.
Address — WESTERN MICHIGAN UNIVERSITY
KALAMAZOO, MI 49007
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 178.0 FT. | Date Completed 11 20/88 | [x] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted ____

6 USE [ ]Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[x]Test W ell [ ]Type IIb Public [ ]_____

7 CASING: [x] Steel [ ] Plastic [x] Threaded [ ] Welded
Diameter
4.00 in. to 174.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Height: Above Surface 1.0 ft.
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SOFT BROWN CLAY & GRAVEL	5	5
COARSE GRAVEL (WATER)	20	25
COARSE CEMENTED GRAVEL	5	30
FINE GRAVEL & COBBLES	5	35
COARSE SAND & GRAVEL	10	45
COARSE SAND	30	75
SOFT GRAY CLAY	22	97
SOFT GRAY CLAY & GRAVEL	3	100
SOFT GRAY CLAY	5	105
SOFT GRAY CLAY & SAND	5	110
COARSE GRAVEL (WATER)	8	118
FINE MUDDY SAND	10	128
FINE GRAY SILT	12	140
SAND & GRAVEL (WATER)	5	145
COARSE SAND	5	150
FINE SAND & GRAVEL	4	154
FINE SAND (WATER)	6	160
FINE GRAY SILT	20	180
HARD GRAY CLAY & GRAVEL	15	195
HARD GRAY CLAY	5	200

8 SCREEN [ ] Not Installed
Type Stainless Steel — Diameter 4.00
Slot 0.070 — Length 4.0
Set between 174.00 ft. and 178.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Brenner Check
[x] Blank above screen 1.0 ft. — Other

9 STATIC WATER LEVEL:
10.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
10 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [ ]Pitless adapter [x]12" above grade
[ ]Basement of Inet [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type None Distance 0 ft. Direction
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [x]No

14 PUMP: [x]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers Name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.
CASING PULLED BACK TO 170'; SCREEN SET BETWEEN 174 AND 178

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 0117

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

F2

1 LOCATION OF WELL 39741202100 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PRAIRIE RONDE	SW 1/4 SE 1/4 SW 1/4	02	04 S	12 W

Distance And Direction From Road Intersection
6500 WEST @ AVE. EAST OF EXISTING HOME
WELL SA-25, SCHOOLCRAFT
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 892.00 msl

3 OWNER OF WELL: WESTERN MICHIGAN UNIVERSITY
Address: GEOLOGY DEPT. KALAMAZOO, MI 49007
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 200.0 FT. | Date Completed 01/31/90 | [x] New Well [ ] Replacement Well

5 [x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger/Bored [ ] Jetted ____

6 USE | [ ]Domestic [ ]Irrigation [x]Test Well | [ ]Type I Public [ ]Type II Public [ ]Type IIb Public | [ ]Type III Public [ ]Heat Pump [ ]_____

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
HARD BROWN CLAY & GRAVEL	8	8
COARSE SAND & GRAVEL "DRY"	7	15
COARSE SAND & GRAVEL SOME BROWN CLAY	3	18
COARSE SAND & GRAVEL "WET"	92	110
FINE SAND	15	125
COARSE SAND & GRAVEL	2	127
HARD GRAY CLAY & GRAVEL	2	129
HARD GRAY CLAY & GRAVEL	5	134
HARD GRAY CLAY & GRAVEL	7	141
COARSE GRAVEL SOME GRAY CLAY "WET"	9	150
HARD GRAY CLAY & GRAVEL	50	200

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 141.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 15.000 Length 4.0
Set between 146.00 ft. and 150.00 ft.
FITTINGS: [ ]K-Packer [ ]Knad Packer [ ]Brenner Check [x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
15 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]Basement of Wall | [ ]12" above grade [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other_____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 150 ft. Direction SW
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [x]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 0112

Address

Signed — Date

AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 2 of 2

1 LOCATION OF WELL 39741201100 | F2 | Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PRAIRIE RONDE	SE 1/4 NE 1/4 NW 1/4	04	04 S	12 W

Distance And Direction From Road Intersection
PAW PAW LAKE RD. 1/4 MILE EAST OF 4TH ST. ON N. SIDE OF
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 902.00 msl

3 OWNER OF WELL — GEOLOGY DEPT.
Address — WESTERN MICHIGAN UNIVERSITY
KALAMAZOO, MI 49007
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 228.0 FT. | Date Completed 11/21/88 | [x] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted ____

6 USE [ ]Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[x]Test Well [ ]Type IIb Public [ ]_____

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
HARD GRAY CLAY & GRAVEL	28	228

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded
Diameter
4.00 in. to 174.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Height: Above Surface 1.0 ft.
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
SLOT 0.070 Length 4.0
Set between 174.00 ft. and 178.00 ft.
FITTINGS: [x]Packer [ ]Lead Packer [ ]Brenner Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
10.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
10 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [ ]Pitless adapter [x]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type None Distance 0 ft. Direction
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [x]No

14 PUMP: [x]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.
CASING PULLED BACK TO 178'; SCREEN SET BETWEEN 174 AND 178

Data Source: Michigan Groundwater Survey

17. Wig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 0112

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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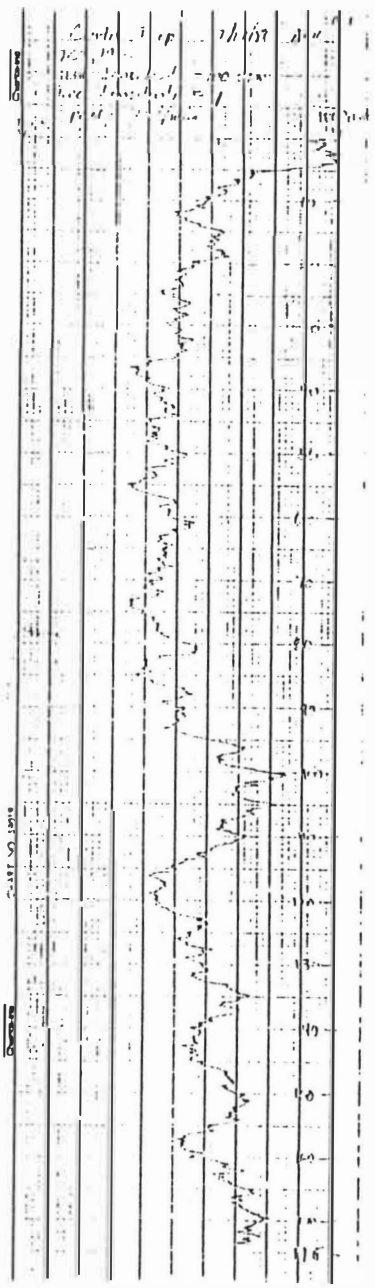
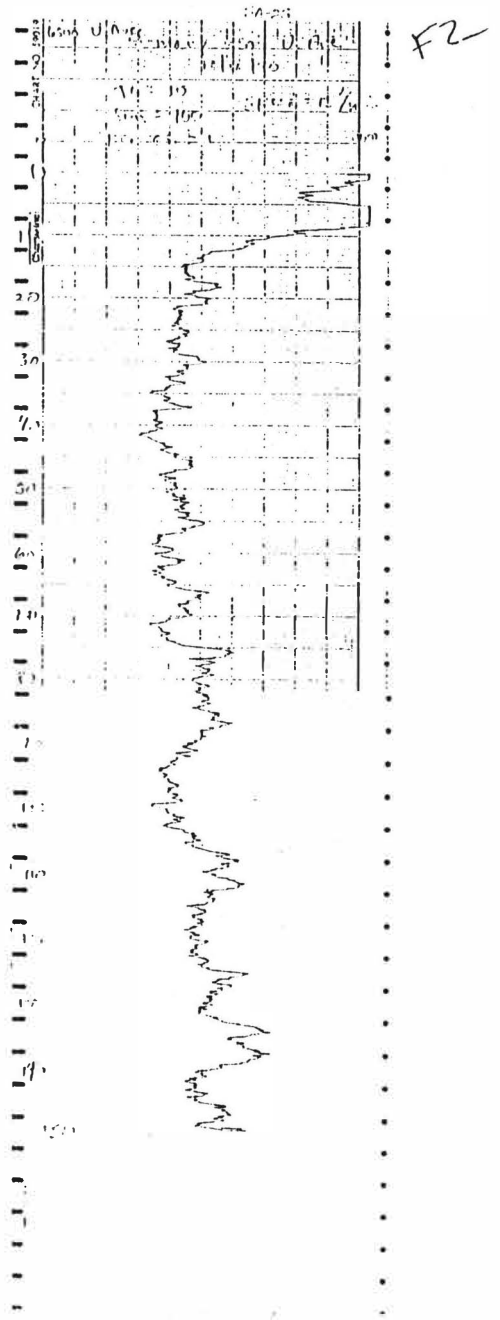
This is not a legal document.



F2.


F2

WATER WELL AND PUMP RECORD

page 1 of 2

F3

1 LOCATION OF WELL 39741118002 | Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	SCHOOLCRAFT	SW 1/4 SE 1/4 NW 1/4	10	04 S	11 W

Distance And Direction From Road Intersection
600' N OF LYON AND 1050' W OF US 131
SCHOOLCRAFT 49087
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 000.00 msl

3 OWNER OF WELL VILLAGE OF SCHOOLCRAFT
Address
SCHOOLCRAFT, MI 49087
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 250.0 FT. | Date Completed 08/11/87 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [x] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted ____

6 USE [ ] Domestic [x] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [ ] _____

7 CASING: [ ] Steel [ ] Threaded | Height: Above Surface 0.0 ft.
[ ] Plastic [ ] Welded
Diameter
4.06 in. to 162.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [ ] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.050 Length 3.0
Set between 162.00 ft. and 165.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Brenner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
13.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	2	2
BROWN SANDY CLAY	2	4
BROWN COARSE TO MED. SAND & GRAVEL	27	31
BROWN FINE TO MED. SAND, SOME GRAVEL	35	66
BROWN MED. TO VERY COARSE GRAVEL AND	28	94
SAND, SOME FINE SAND;GRAY CLAY TRAC		
BROWN FINE TO VERY FINE SAND. SOME SILT;	61	155
GRAVEL TRACES		
BROWN FINE TO COARSE SAND WITH FINE GRAVEL	10	165
GRAY CLAYEY SAND WITH GRAVEL	3	168
GRAY CLAY WITH GRAVEL	4	172
GRAY CLAYEY GRAVEL	2	174
GRAY CLAY WITH GRAVEL	3	177
BROWN SAND AND GRAVEL WITH GRAY CLAY	2	179
BROWN SAND WITH GRAVEL	4	183
GRAY CLAY & BROWN SAND WITH GRAVEL	2	185
GRAY CLAY	4	189
BROWN SAND WITH GRAY CLAY, SOME GRAVEL	2	191
BROWN FINE SAND, SOME GRAVEL	5	196
GRAY SANDY CLAY, SOME GRAVEL	2	198

15. Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

1250
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 2 of 2

1 LOCATION OF WELL 39741118002 F3				Tax Parcel #
County: KALAMAZOO	Township Name: SCHOOLCRAFT	Fraction: SW 1/4 SE 1/4 NW 1/4	Section: 18	Town: 04 S / Range: 11 W

Distance And Direction From Road Intersection
600' N OF LYON AND 1050' W OF US 131
SCHOOLCRAFT 49087
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 000.00 msl

1 OWNER OF WELL: VILLAGE OF SCHOOLCRAFT
Address
SCHOOLCRAFT, MI 49087
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 250.0 FT. ; Date Completed 08/11/87 ; [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [x] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted ____

6 USE [ ] Domestic [x] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [ ] _____

7 CASING: [ ] Steel [ ] Threaded ; Height: Above Surface 0.0 ft.
[ ] Plastic [ ] Welded
Diameter
4.00 in. to 162.0 ft. depth ; Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter ; Drive Shoe [ ] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
GRAY CLAY	1	199
GRAY SANDY CLAY, SOME GRAVEL	2	201
HARD GRAY CLAY, SOME GRAVEL	20	221
HARD GRAY SLICK(OILY) CLAY-COLDWATER SHALE	29	250

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.050 Length 3.0
Set between 162.00 ft. and 165.00 ft.
FITTINGS: [ ] K-Packer [ ] Bead Packer [ ] Drawdown Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
13.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

1250
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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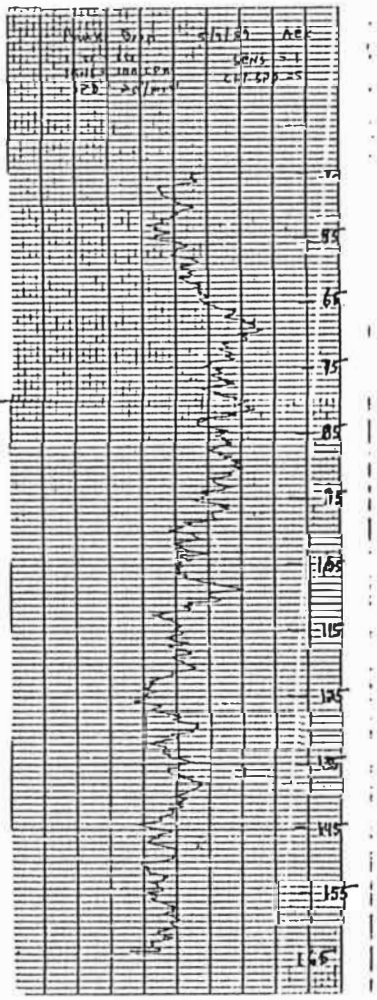
Well Name Hawks (Schoolcraft Cemetery - Deep Well) SA-9
Location NW1/4, SE1/4, NW1/4, Sec. 12, T4S, R12W
Date 5/9/89 Operator AEK
Time Constant 10 Sensitivity (cpm) 100
Speed 20'/min Chart Sensitivity 1
Chart Speed 5

#3



WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL — 19761105161 — FL

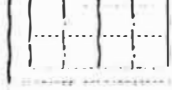
Tax Parcel #

County: KALAMAZOO | Township Name: SCHOOLCRAFT | Fraction: NW 1/4 NW 1/4 SW 1/4 | Section: 05 | Town: 04 S | Range: 11 W

Distance And Direction From Road Intersection
SCHOOLCRAFT TWP. WELL CORNER OF W KILGORE AND 10TH ST.
PORTAGE

Street Address & City of Well Location

Circle with "X" in Section Box — Sketch Map



ELEVATION: 870.90 msl

2 FORMATION DESCRIPTION

FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND "DRY"	17	17
COARSE SAND "WET"	37	54
COARSE SAND AND GRAVEL	11	65
HARD GRAY CLAY AND GRAVEL	4	69
MUDDY COARSE SAND	18	87
COARSE SAND	8	95
GRAVEL	22	265
COARSE SAND	3	268
SOFT GRAY CLAY AND GRAVEL	5	273
COARSE SAND	6	279

11 Remarks, Elevation, source of data, etc.
CONTRACTOR REPORT

Data Source: Michigan Groundwater Survey

12. Rig Operator's Name:

3 WELL OWNER: — Date Completed: 07/11/10 — [x] New Well — [ ] Replacement Well — 240.0 ft.

[x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow Rod [ ] Auger/Bored [ ] Jetted

4 USE: [ ] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[x] Test Well [ ] Type I NonPublic [ ]

7 CASING: [x] Steel [x] Threaded — Weight: 21 lbs
[ ] Plastic [ ] Welded — Surface 1.0 ft.
Diameter
4.50 in. to 222.0 ft. depth — Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Drilled Drill Hole Diameter — Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.012 Length 5.0
Set between 221.00 ft. and 229.00 ft.
FITTINGS: [X]-Packer [ ]Lead Packer [ ]Drawdown Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
17.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: Below land surface
17 ft. after 1.0 hrs. pumping at 30 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [ ]Pitless adapter [ ]Pitless unit [ ]Well Cap
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED [ ]No [ ]Yes From to ft.
No. of Bags of cement Additives

13 Nearest source of possible contamination
Type Septic Distance 150 ft. Direction N
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M.
Type: [ ]Submersible [ ]Jet
PRESSURE TANK
Manufacturer's name
Model number Capacity 0 Gallons

15 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was installed under my jurisdiction and this report is true to the best of my knowledge and belief.

6112
ENTERPRISE BUSINESS NAME — REGISTRATION NO.

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 39111101 | FS Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	SCHOOLCRAFT	SW 1/4 SW 1/4 SW 1/4	13	04 S	11 W

Distance And Direction From Road Intersection
500' E. AND 200' S. OF NW CORNER OF HENRY LEJA BUSINESS

Street Address & City of Well Location:

Locate with 'X' in Section Below   Sketch Map

ELEVATION 878.00 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH to BOTTOM of STRATUM
TOP SOIL AND BROWN CLAY	2	2
BROWN CLAY, SAND & GRAVEL	4	6
BROWN MEDIUM TO COARSE SAND WITH FINE GRAVEL	4	10
BROWN COARSE TO MEDIUM SAND AND FINE TO COARSE GRAVEL	11	21
BROWN MEDIUM TO VERY COARSE GRAVEL AND SAND	2	25
BROWN COARSE TO MEDIUM SAND AND FINE TO COARSE GRAVEL	6	31
BROWN MEDIUM TO VERY COARSE GRAVEL AND SAND	5	36
BROWN CLAY	1	37
BROWN FINE TO MEDIUM SAND , LITTLE COARSE SAND	4	41
GRAY SANDY CLAY AND GRAVEL	11	52
BROWN COARSE TO VERY COARSE GRAVEL WITH MEDIUM GRAVEL, SOME MEDIUM TO CO	8	60
BROWN MEDIUM TO FINE SAND AND GRAVEL	26	81
BROWN SANDY CLAY WITH GRAVEL	11	93
BROWN MEDIUM TO COARSE GRAVEL AND STONES	2	101
BROWN MED. TO FINE SAND WITH FINE GRAVEL	19	120
BROWN MED. TO FINE SAND, TRACE COARSE SAND	6	126
BLUISH GRAY OILY SILTY CLAY	11	139

3 OWNER OF WELL VILLAGE OF VICKSBURG
Address

Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 180.0 FT. | Date Completed 07/11/79 | [x] New Well [ ] Replacement Well

5 [ ] Cable tool [x] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [ ] Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[x]Test Well [ ]Type IIb Public [ ]

7 CASING: [x] Steel [ ] Threaded | Height: Above
[ ] Plastic [ ] Welded | Surface 0.0 ft.
Diameter
6.00 in. to 106.0 ft. depth | Weight lbs/ft.
4.00 in. to 0.0 ft. depth
Borehole Drill Hole Diameter | Drive Shoe [ ] Yes
0.00 in. to 0.0 ft. depth | [x] No
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 2.00
Slot 0.018 Length 5.0
Set between 106.00 ft. and 111.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Bremer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
0.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other
No. of bags of cement Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturer's name
Model number Capacity 0 Gallons

15 Remarks,elevation,source of data,etc.
[illegible] ASSOCIATES] FE .58 [illegible] ADDRESS14,7 10 7

Data Source: Michigan Groundwater Survey

17. Pump Installer's Name:

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.

REGISTERED BUSINESS NAME   REGISTRATION NO.

Address

Signed   Date
AUTHORIZED REPRESENTATIVE

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This is not a legal document.

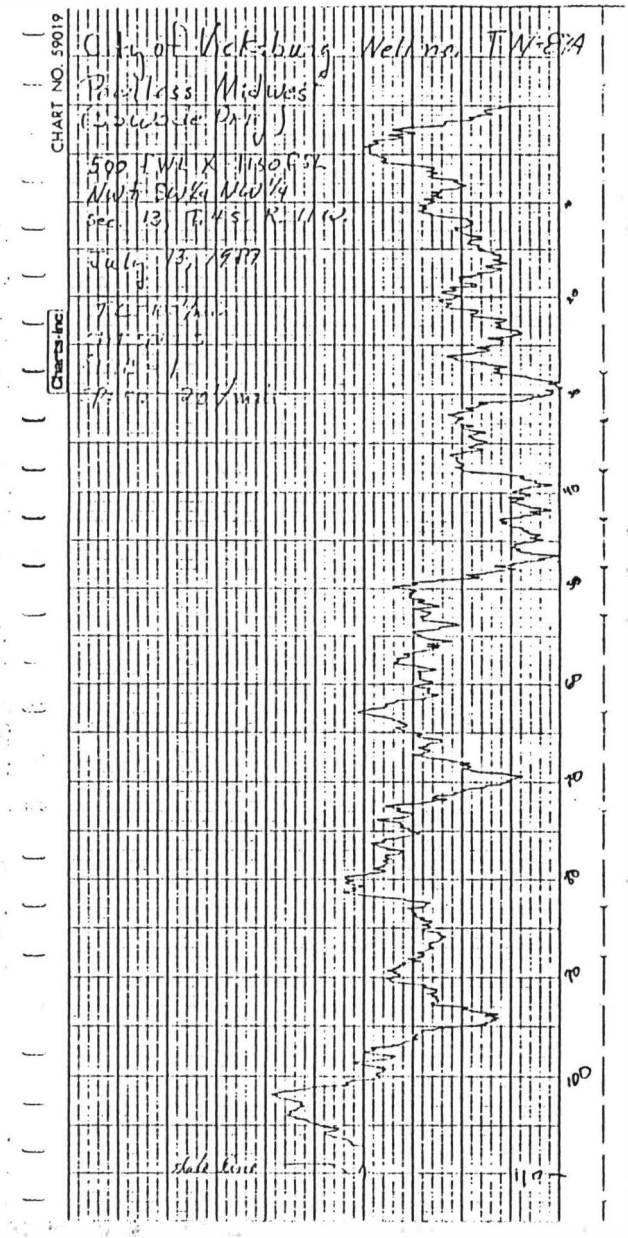
CHART NO. 59019
Charts-Inc
City of Vicksburg Well no. TW-8A
Miss. Midwest
500 FWL X 1150 FSL
NW¼ SW¼ NW¼
Sec. 13 T. 4S R. 11W
July 13, 1987
state line

F5

WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 12741912000 IF6

Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	SE 1/4 SE 1/4 SW 1/4	19	04 S	10 W

Distance And Direction From Road Intersection
209' E OF WILSON AND 150' N OF W
5290 W AVENUE, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 850.00 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	2	2
FINE SAND	20	22
SAND & CLAY	10	[illegible]
CLAY	26	[illegible]
SAND & CLAY	20	78
FINE SAND	[illegible]	[illegible]
COARSE SAND	12	[illegible]

1 OWNER OF WELL: LAPEER, GEORGE
Address: 5290 W AVENUE
VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 115.0 ft. | Date Completed 01/16/97 | [ ] New Well [ ] Replacement Well

5 [x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [x] Domestic [ ] Type I Public [ ] Type IIb Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [ ]

7 CASING: [x] Steel [x] Threaded | Height: Above
[ ] Plastic [ ] Welded | Surface 1.0 ft.
Diameter
6.00 in. to 110.0 ft. depth | Weight __ lbs/ft.
4.00 in. to 115.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes
6.00 in. to 30.0 ft. depth | [ ] No
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 3.00
Slot 0.012 Length 5.0
Set between 110.00 ft. and 115.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Bremner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
22.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
26 ft.after 2.0 hrs.pumping at 10 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From 0 to 30 ft.
[ ] Neat cement [x]Bentonite [ ] Other
No. of bags of cement __ Additives ______

13 Nearest source of possible contamination
Type Septic Distance 55 ft. Direction S
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name F & W
Model number HP .75 Volts
Length of Drop Pipe 42 ft. capacity 10 G.P.M.
TYPE: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 19 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name

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.

REGISTERED BUSINESS NAME	REGISTRATION NO.
	1704

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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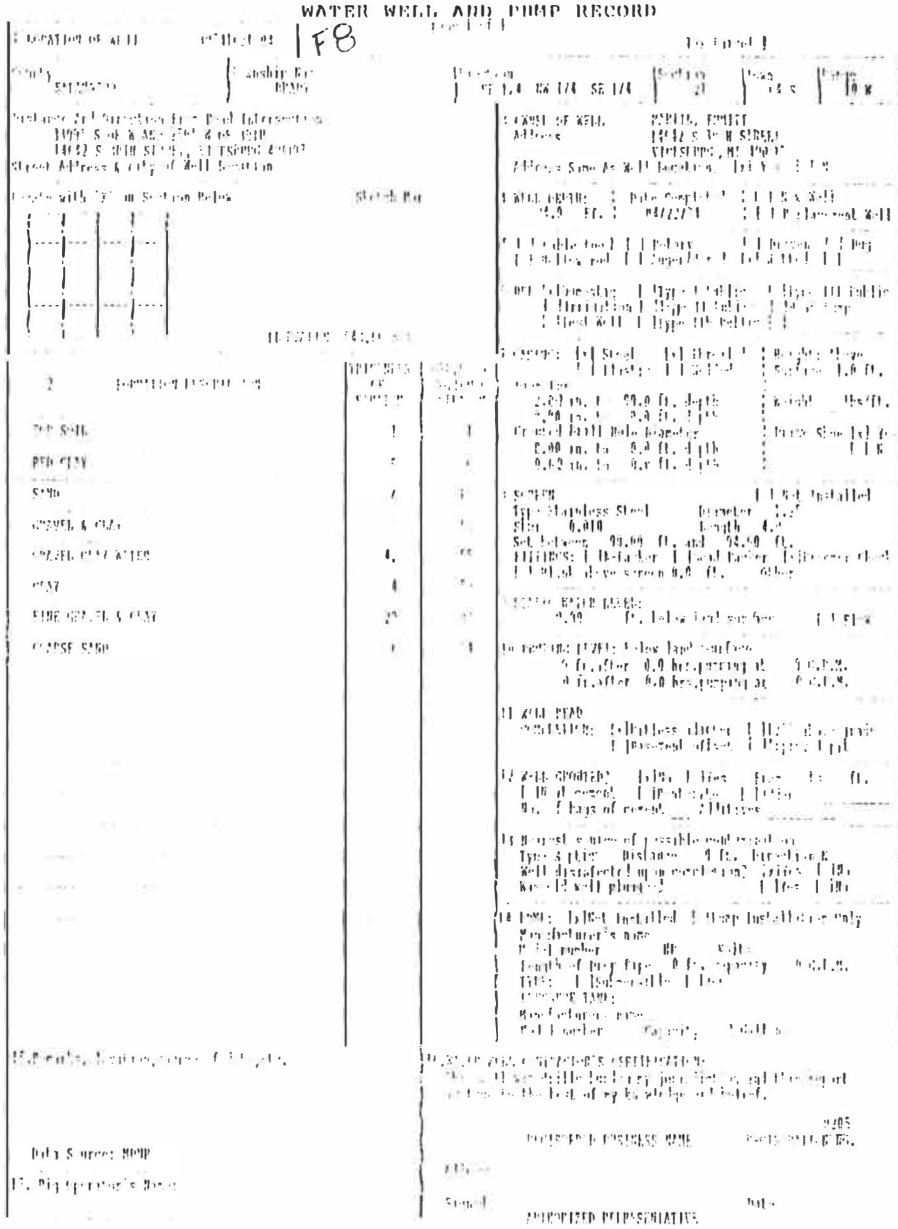
WATER WELL AND PUMP RECORD

SAND
WATER SAND
GRAY CLAY AND STONES
WATER SAND

Data Source: OWRB

WATER WELL AND PUMP RECORD



WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 39[illegible] | F9 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	NE 1/4 SE 1/4 SW 1/4	[illegible]	[illegible] S	10 W

Distance And Direction From Road Intersection
[illegible]' S OF Z AVE 600' W OF [illegible]
15274 S [illegible] STREET, VICKSBURG [illegible]
Street Address & City of Well Location

Locate with "X" in Section Below [illegible]

ELEVATION [illegible] ft

3 OWNER OF WELL [illegible]
Address 15274 S [illegible]
VICKSBURG, MI [illegible]
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: [illegible] FT. | Date Completed 06/23/75 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Augered/Bored [x] Jetted [ ] ______

6 USE [x] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type III Public [ ]

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND, GRAVEL	12	[illegible]
SAND, GRAVEL, CLAY	30	[illegible]
SAND FINE	12	[illegible]
SAND COURSE	4	[illegible]

7 CASING: [x] Steel [x] Threaded | Height: Above
[ ] Plastic [ ] Welded | Surface 1.0 ft.
Diameter
2.00 in. to 0.0 ft. Depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. Depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. Depth
0.00 in. to 0.0 ft. Depth

8 SCREEN [ ] [illegible] Installed
Type Unknown Diameter 1.[illegible]
Slot 0.0[illegible] Length [illegible]
Set between [illegible] ft. and [illegible] ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bronze Clip
[ ] Blank above screen [illegible] ft. Other

9 STATIC WATER LEVEL:
12.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [x] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [ ] No [ ] Yes From ft. to ft.
[ ] Neat cement [ ] Bentonite [ ] Other ______
No. of bags of cement __ Additives ______

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] [illegible]
PRESSURE TANK:
Manufacturer's name
Model number Capacity 0 Gallons

15 Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

0117
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

This is an MDNR computer generated facsimile of a water well record submitted under PA 368 of 1978.
This is not a legal document.

WATER WELL AND PUMP RECORD

[illegible]

1. LOCATION OF WELL 0?41222992 | Ct 1 | Tax Parcel #

County: KALAMAZOO | Township Name: [illegible] | Fraction: [illegible] 1/4 SE 1/4 NE 1/4 | Section: 22 | Town: 3S S | Range: 12 W

Distance And Direction From Road Intersection:
[illegible] S OF [illegible] AND 250' W OF [illegible] STREET
[illegible], SCHOOLCRAFT [illegible]

Street Address & City of Well Location: [illegible]

Locate with "X" in Section Below [illegible]

ELEVATION: 8??.00 msl

2. OWNER OF WELL: VILLAGE OF SCHOOLCRAFT
Address: [illegible] STREET
SCHOOLCRAFT, MI 49087
Address Same As Well Location: [ ] Yes [x] No

3. WELL DEPTH: 2?0.0 FT. | Date Completed: ?1/??/?? | [ ] New Well [ ] Replacement Well

4. [ ] Cable tool [x] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

5. USE: [ ] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[x] Test Well [ ] Type III Public [ ] ________

2. FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN SANDY CLAY	6	[illegible]
BROWN MEDIUM TO FINE WITH COARSE SAND, SOME FINE GRAVEL	26	32
BLUISH GRAY CLAY	[illegible]	[illegible]
GRAY-BROWN FINE TO MEDIUM SAND	[illegible]	[illegible]
GRAY MEDIUM TO COARSE WITH FINE SAND, LITTLE GRAVEL	[illegible]	71
[illegible] GRAY MEDIUM TO COARSE SAND WITH FINE GRAVEL, SOME MEDIUM TO COARSE	[illegible]	[illegible]
BROWN CLAY	[illegible]	[illegible]
GRAY MEDIUM TO FINE WITH COARSE SAND, TRACE OF GRAVEL	[illegible]	[illegible]
GRAY MEDIUM TO COARSE WITH FINE SAND, SOME FINE TO COARSE GRAVEL	1?	1?2
GRAY SANDY CLAY	[illegible]	1?4
BLUE CLAY	[illegible]	1??
BLUE CLAY WITH ABUNDANT GRAY-BROWN SHALE FRAGMENTS	18	1??
SOFT BLUE SHALE W/LAYERS OF GRAY SHALE	[illegible]	[illegible]

7. CASING: [ ] Steel [ ] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 0.0 ft.
Diameter:
2.00 in. to 155.0 ft. depth
2.00 in. to 0.0 ft. depth
Weight ___ lbs/ft.
Drive Shoe [x] Yes [ ] No
Ground Drill Hole Diameter:
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8. SCREEN [ ] Not Installed
Type: Unknown Diameter: 2.00
Make: 0.000 Length: 5.0
Set between 155.00 ft. and 160.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bronze Shoe
[ ] Blank above screen 0.0 ft. Other

9. STATIC WATER LEVEL:
15.23 ft. below land surface [ ] Flow

10. PUMPING LEVEL below land surface:
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11. WELL HEAD COMPLETION: [ ] Pitless adapter [ ] 12" above grade
[ ] Basement offset [ ] Approved pit

12. WELL GROUTED? [ ] No [ ] Yes From ft. to ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement ___ Additives

13. Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14. PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
Type: [ ] Submersible [ ] [illegible]
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15. Remarks, elevation, source of data, etc.

Data Source: [illegible]

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.

1989

REGISTERED BUSINESS NAME   REGISTRATION NO.

Address

Signed   Date

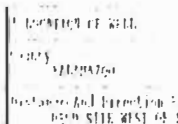
AUTHORIZED REPRESENTATIVE

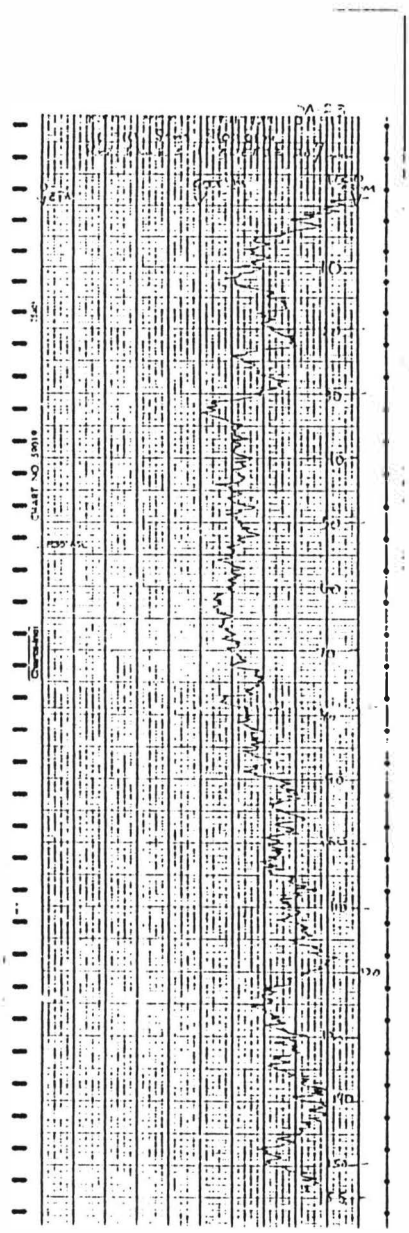
17. Pump Installer's Name:

This is a [illegible] computer generated facsimile of a water well record submitted under [illegible]. This is not an official record.

WATER WELL AND PUMP RECORD

G2





WATER WELL AND PUMP RECORD

1 LOCATION OF WELL 07341130001 | Cx3

Tax Parcel [illegible]

County	Township Name	Fraction	Section	Town	Range
[illegible]	SCHOOLCRAFT	[illegible] SW 1/4 NE 1/4	10	34 S	11 W

Distance And Direction From Road Intersection
70' N OF 77 AND 1090' E OF US 131
US 131 AND 77, SCHOOLCRAFT 49087
Street Address & City of Well Location

Locate with "X" in Section Below — Sketch Map

ELEVATION 872.00 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	2	2
MEDIUM SAND	23	25
MEDIUM SAND & SM GRAVEL	19	44
COARSE SAND AND GRAVEL	15	[illegible]
FINE SAND -LITTLE GRAVEL	15	120
SILTY SAND	27	147
SOFT GRAY CLAY	53	207
COARSE SAND AND GRAVEL WITH BOULDERS	63	270
COLDWATER SHALE WITH LIMESTONE	7	277

3 OWNER OF WELL: [illegible] — WOLVERINE [illegible]
Address: US 131 AND 77, SCHOOLCRAFT, MI 49087
Address Same As Well Location: [x] Yes [ ] No

4 WELL DEPTH: 277.0 ft. | Date Completed 06/26/73 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [x] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE: [ ] Domestic [ ] Type I Public [ ] Type III Public
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [ ]

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 2.6 ft.
Diameter
8.00 in. to 69.0 ft. depth | Weight [illegible] lbs/ft.
0.00 in. to 0.0 ft. depth
Completed Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type [illegible] Diameter 8.00
Slot 0.025 Length 10.0
Set between 65.00 ft. and 75.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bronze [illegible]
[ ] Plug [illegible] above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
10.30 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft. after 0.5 hrs. pumping at 400 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [x] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [x] No [ ] Yes From [illegible] ft.
[ ] Neat cement [ ] Bentonite [ ] Other
No. of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [x] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] [illegible]
PRESSURE TANK:
Manufacturer's name
Model number Capacity 0 Gallons

15 Remarks, elevation, source of data, etc.

Data Source: MGSD

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 1250

Address

Signed — AUTHORIZED REPRESENTATIVE — Date

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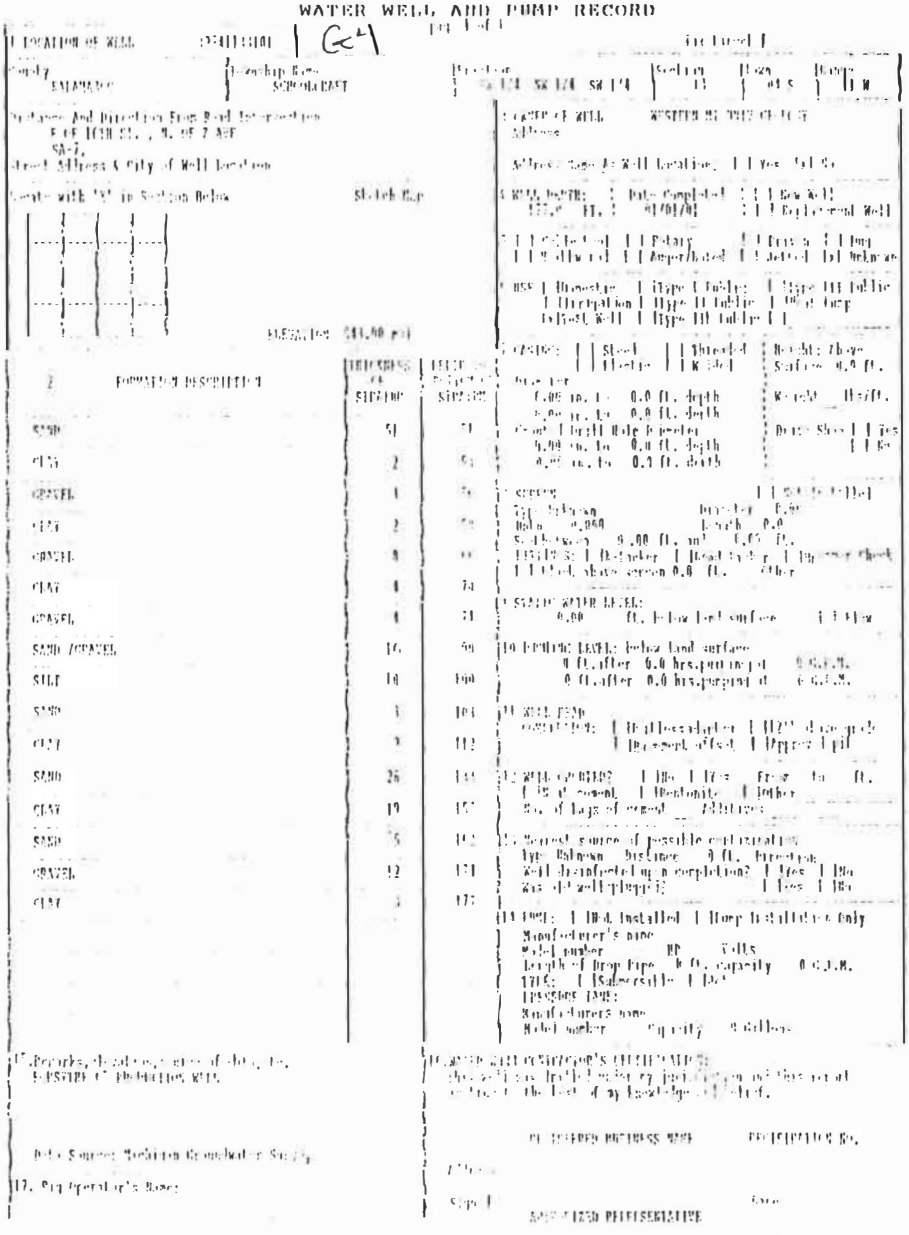
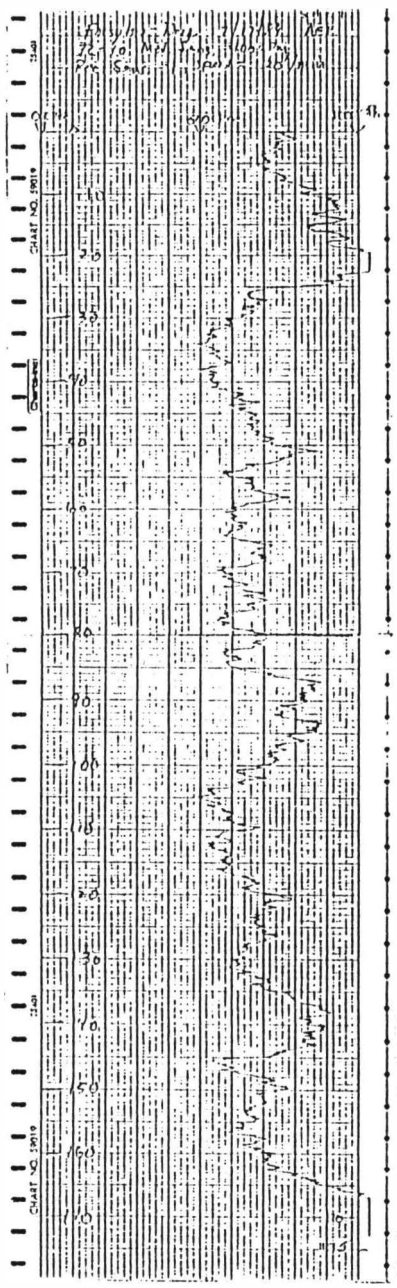
WATER WELL AND PUMP RECORD



This is an NRDD computer generated facsimile of a water well record submitted under RA 168 of 1976.
There is not a hard copy.



G-1

WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 39741127100 G5 Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	SCHOOLCRAFT	SE 1/4 SW 1/4 SW 1/4	27	04 S	11 W

Distance And Direction From Road Intersection
11 AVE 1/4 MILE INTO SOUTH ON HOWARD LAKE
WELL SA-5,
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 841.00 msl

3 OWNER OF WELL — GEOLOGY DEPT
Address — WESTERN MICH UNIVERSITY
KALAMAZOO, MI 49007
Address Same As Well Location? | | Yes [x] No

4 WELL DEPTH: 205.0 FT. | Date Completed 12/10/88 | [x] New Well | | Replacement Well

5 [x] Cable tool | | Rotary | | Driven | | Dug | | Hollow rod | | Auger/Bored | | Jetted ____

6 USE | |Domestic | |Type I Public | |Type III Public | |Irrigation | |Type II Public | |Heat Pump | [x]Test We ll | |Type IIb Public | | _____

7 CASING: [x] Steel | | Plastic | [x] Threaded | | Welded | Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 156.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes | | No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN | | Not Installed
Type Stainless Steel Diameter 4.00
Slot 15.000 Length 6.0
Set between 156.00 ft. and 162.00 ft.
FITTINGS: | |K-Packer | |Bead Packer | |Bremmer Check [x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
8.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
0 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: | |Pitless adapter [x]12" above grade | |Basement offset | |Approved pit

12 WELL GROUTED? | |No [x]Yes From to ft.
| |Neat cement [x]Bentonite | |Other_____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type None Distance 0 ft. Direction
Well disinfected upon completion? [x]Yes | |No
Was old well plugged? | |Yes | |No

14 PUMP: [x]Not Installed | |Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: | |Submersible | |Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
COARSE DRY SAND	6	6
COARSE SAND & GRAVEL	14	20
SILT, FINE SAND, LITTLE GRAY CLAY	15	35
COARSE SAND (WET)	43	78
COARSE SAND & GRAVEL (WET)	13	91
GRAVEL (WET)	3	96
COARSE SAND (WET)	7	103
COARSE SAND & GRAVEL (WET)	2	105
GRAVEL (WET)	32	137
COARSE SAND & GRAVEL (WET)	11	148
GRAVEL (WET)	14	162
SOFT GRAY CLAY AND GRAVEL	8	170
HARD GRAY CLAY	35	205

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 0112

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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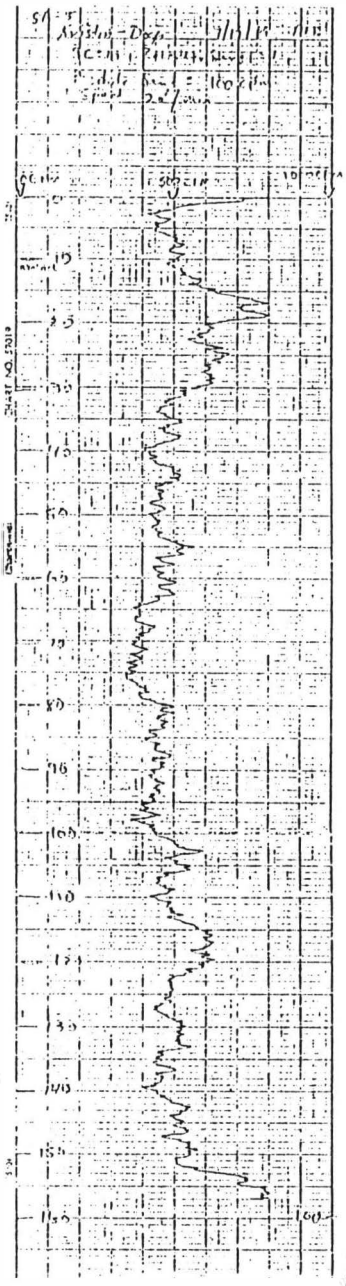
This is not a legal document.



WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 39[illegible]5001 | Gc6

Tax Parcel [illegible]

County: KALAMAZOO | Township Name: SCHOOLCRAFT | Fraction: [illegible] 1/4 [illegible] 1/4 NW 1/4 | Section: [illegible] | Town: 4 S | Range: 11 W

Distance And Direction From Road Intersection
1230' S OF [illegible] AND 450' W OF 21ST
15540 S 21ST, SCHOOLCRAFT MI [illegible]
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION: 8[illegible]0.00 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
DRY SAND AND GRAVEL	10	10
COARSE SAND	[illegible]	110

3 OWNER OF WELL: MOTT, [illegible]
Address: 3209 [illegible]
KALAMAZOO, MI 4900[illegible]
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 110.0 FT. | Date Completed: 09/04/8[illegible] | [x] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [ ] Domestic [ ] Type I Public [ ] Type III Public [x] Irrigation [ ] Type II Public [ ] Heat Pump [ ] Test Well [ ] Type III Public [ ]

7 CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 100.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN: [ ] Not Installed
Type Stainless Steel Diameter 4.0"
Slot 0.015 Length 10.0
Set between 100.00 ft. and 110.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ] Bronze Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
15 ft. after 1.0 hrs. pumping at 50 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [ ] Pitless adapter [x] 12" above grade [ ] Basement offset [ ] Approved pit

12 WELL GROUTED: [ ] No [ ] Yes From To ft.
[ ] Neat cement [x] Bentonite [ ] Other
No. of bags of cement __ Additives __

13 Nearest source of possible contamination:
Type None Distance 0 ft. Direction
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [x] Not Installed [ ] Pump Installation Only
Manufacturer's Name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturer's Name
Model number Capacity 0 Gallons

15 Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

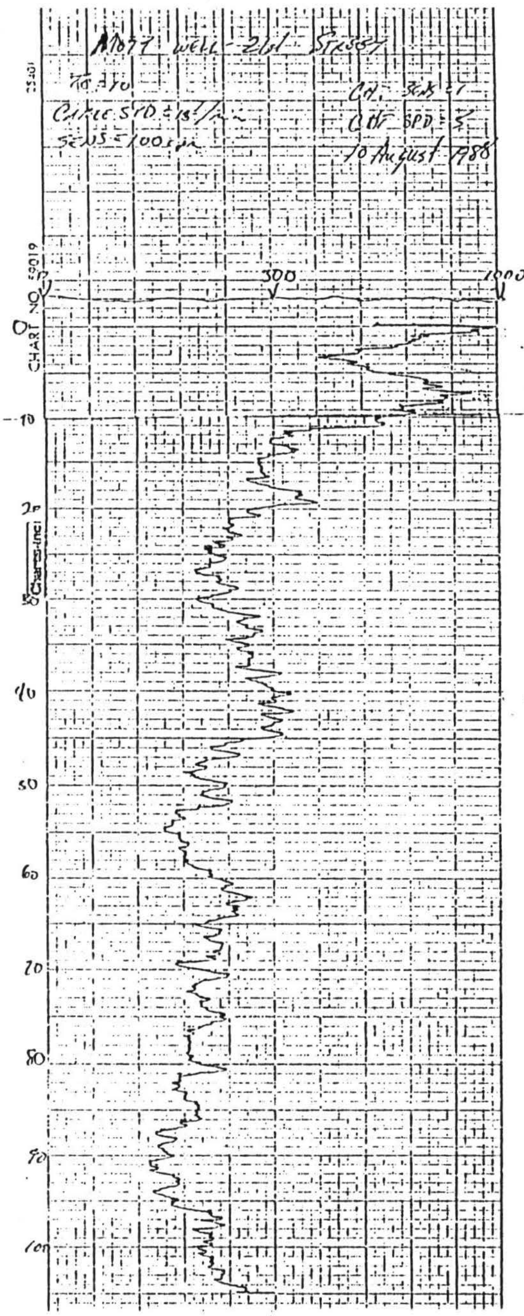
0112
REGISTERED BUSINESS NAME — REGISTRATION NO.

Address

Signed — AUTHORIZED REPRESENTATIVE — Date

This is an MDNR computer generated facsimile of a water well record submitted under PA 368 of 1978. [illegible]

G6



WATER WELL AND PUMP RECORD

page 1 of 1

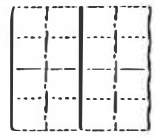
1 LOCATION OF WELL 39741126001 G07 Tax Parcel

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	SCHOOLCRAFT	SE 1/4 SE 1/4 NE 1/4	26	04 S	11 W

Distance And Direction From Road Intersection
100' N OF KY AND 150' W OF 22ND
15540 S 22ND, SCHOOLCRAFT 49087
Street Address & City of Well Location

3 OWNER OF WELL
Address 15540 S 22ND
SCHOOLCRAFT, MI 49087
Address Same As Well Location? [x] Yes [ ] No

Locate with 'X' in Section Below — Sketch Map



ELEVATION 845.00 msl

4 WELL DEPTH: 87.0 FT. | Date Completed 06/29/83 | [ ] New Well [ ] Replacement Well

5 [x] Cable Tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [x] Domestic [ ] Irrigation [ ] Test Well | [ ] Type I Public [ ] Type II Public [ ] Type IIb Public | [ ] Type III Public [ ] Heat Pump

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
4.09 in. to 83.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight _ lbs/ft.
Drive Shoe [x] Yes [ ] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	30	30
GRAY CLAY & GRAVEL	50	80
COARSE SAND & GRAVEL	7	87

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.010 Length 4.0
Set between 83.00 ft. and 87.00 ft.
FITTINGS: [x] K-Packer [ ] Lead Packer [ ] Bremmer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
30.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
30 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x] Pitless adapter [ ] Basement offset | [ ] 12" above grade [ ] Approved pit

12 WELL GROUTED? [ ] No [x] Yes From to ft.
[ ] Neat cement [x] Bentonite [ ] Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Septic Distance 90 ft. Direction W
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [ ] Not Installed [ ] Pump Installation Only
Manufacturer's name STA RITE
Model number HP .5 Volts
Length of Drop Pipe 42 ft. capacity 14 G.P.M.
TYPE: [x] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 14 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME 0112 REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 39741030001 C&S Tax Parcel

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	SW 1/4 SW 1/4 SW 1/4	30	04 S	10 W

Distance And Direction From Road Intersection
250' E OF 24TH AND 120' N OF T
5085 T AVENUE, VICKSBURG 49097
Street Address & City of Well Location

3 OWNER OF WELL MANSE, BRUCE
Address 308 S MICHIGAN
VICKSBURG, MI 49097
Address Same As Well Location? [ ] Yes [x] No

Locate with 'X' in Section Below Sketch Map

ELEVATION 848.00 msl

4 WELL DEPTH: 40.0 FT. | Date Completed 05/08/76 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [x] Jetted [ ] _____

6 USE [x]Domestic [ ]Irrigation [ ]Test Well | [ ]Type I Public [ ]Type II Public [ ]Type IIb Public | [ ]Type III Public [ ]Heat Pump [ ]_____

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	12	12
CLAY	23	35
SAND & GRAVEL	5	40

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
2.00 in. to 37.0 ft. depth
1.25 in. to 40.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 1.25
SLOT 0.010 Length 3.0
Set between 37.00 ft. and 40.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Brenner Check [ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
14.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]Basement offset | [ ]12" above grade [ ]Approved pit

12 WELL GROUTED? [ ]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 60 ft. Direction NW
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name DAYTON
Model number HP .5 Volts
Length of Drop Pipe 21 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [x]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME 0467 REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL: 39741028004 | G&9 | Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	NW 1/4 SW 1/4 SE 1/4	28	04 S	10 W

Distance And Direction From Road Intersection
1450' S OF KY AND 250' E OF 29TH
15731 S 29TH STREET, VICKSBURG 49097
Street Address & City of Well Location

3 OWNER OF WELL: JORDEN, FRED
Address: 7215 RAVINE
KALAMAZOO, MI 49009
Address Same As Well Location? | | Yes [x] No

Locate with 'X' in Section Below — Sketch Map

ELEVATION 854.00 msl

4 WELL DEPTH: 107.0 Ft. | Date Completed 02/28/16 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[x] Hollow rod [ ] Auger/Bored [ ] Jetted [ ] _____

6 USE ([x]Domestic | [x]Irrigation | [ ]Test Well | [ ]Type I Public | [ ]Type II Public | [ ]Type IIb Public | [ ]Type III Public | [ ]Heat Pump | [ ]_____

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	3	3
SAND & GRAVEL	18	21
GRAVEL & CLAY	16	37
GRAY CLAY	22	59
CLAY GRAVEL	16	75
BLACK CLAY	12	87
SAND CLAY	12	99
WATER SAND	8	107

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft. | Weight __ lbs/ft.
Diameter
2.00 in. to 103.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Unknown Diameter 1.25
SLOT 0.010 Length 4.0
Set between 103.00 ft. and 107.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [ ]Brenner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
16 ft.after 1.0 hrs.pumping at 15 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter | [ ]Basement offset | [ ]12" above grade | [ ]Approved pit

12 WELL GROUTED? [x]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other_____
No. of bags of cement __ Additives _____

11 Nearest source of possible contamination
Type Septic Distance 75 ft. Direction E
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name RAPIDAIRON
Model number HP .75 Volts
Length of Drop Pipe 42 ft. capacity 12 G.P.M.
TYPE: [ ]Submersible [x]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 12 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. [15]

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL: 39741034001 | C-10 | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	NE 1/4 NE 1/4 NW 1/4	34	04 S	10 W

Distance And Direction From Road Intersection
500' S OF T AND 100' W OF 31ST
16082 S 31ST STREET, VICKSBURG 49097
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 853.00 msl

1 OWNER OF WELL: BOWER, WILLIAM
Address: 701 HAMILTON
VICKSBURG, MI 49097
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 50.0 FT. | Date Completed 11/20/76 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [x] Jetted [ ] _____

6 USE [x]Domestic [ ]Irrigation [ ]Test Well | [ ]Type I Public [ ]Type II Public [ ]Type IIb Public | [ ]Type III Public [ ]Heat Pump [ ] _____

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND	5	5
CLAY	3	8
COURSE SAND	11	19
CLAY	2	21
COURSE SAND AND STONE	25	46
WATER SAND	4	50

7 CASING: [x] Steel [ ] Plastic | [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
2.00 in. to 47.0 ft. depth
1.75 in. to 50.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 1.25
SLOT 0.010 Length 3.0
Set between 47.00 ft. and 50.00 ft.
FITTINGS: [ ]Bk-Packer [ ]Lead Packer [ ]Reamer Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
15 ft.after 1.0 hrs.pumping at 13 G.P.M.
15 ft.after 1.0 hrs.pumping at 13 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]12" above grade [ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [x]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 50 ft. Direction S
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name RAPIDATION
Model number HP .5 Volts
Length of Drop Pipe 26 ft. capacity 10 G.P.M.
TYPE: [ ]Submersible [x]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 10 Gallons

15.Remarks,elevation,source of data,etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 1862

Address

Signed — Date

AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL: 39741[illegible]5002 | Cell | Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	BRADY	NE 1/4 NW 1/4 SE 1/4	35	04 S	10 W

Distance And Direction From Road Intersection
[100' E OF 33RD AND 300' S OF T]
9722 T] AVENUE, VICKSBURG 49097
Street Address & City of Well Location

1 OWNER OF WELL
Address: 9722 T] AVENUE
VICKSBURG, MI 49097
Address Same As Well Location? [x] Yes [ ] No

Locate with 'X' in Section Below — Sketch Map

ELEV ATI@ 886.00 msl

4 WELL DEPTH: 58.0 FT. | Date Completed 10/00/81 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [x] Jetted [ ] _____

6 USE [x] Domestic [ ] Type I Public [ ] Type III Pub li
[ ] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [ ] _____

7 CASING: [x] Steel [ ] Threaded | Height: Above Surface 1.0 ft.
[ ] Plastic [x] Welded
Diameter
2.00 in. to 54.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type — Diameter 1.25
GAMIZ 80.000 — Length 3.5
Set between 54.50 ft. and 58.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [x] Brenner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
25.00 ft. below land surface [ ] Flow

10 PUMPING LEV EL: below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ] Pitless adapter [x] 12" above grade
[ ] Basement offset [ ] Approved pit

12 WELL GROUTED? [x] No [ ] Yes From to ft.
[ ] Neat cement [ ] Bentonite [ ] Other_____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 50 ft. Direction NE
Well disinfected upon completion? [x] Yes [ ] No
Was old well plugged? [ ] Yes [ ] No

14 PUMP: [x] Not Installed [ ] Pump Installation Only
Manufacturer's name
Model number — HP — Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ] Submersible [ ] Jet
PRESSURE TANK:
Manufacturers name
Model number — Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	1	1
RED CLAY	8	9
RED CLAY AND SAND	24	33
GRAV E	6	39
SHALE	2	41
BLUE CLAY SANDY WATER	11	52
BLUE CLAY	2	54
SANDY WATER	4	58

15. Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

0205
REGISTERED BUSINESS NAME — REGISTRATION NO.

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 390412280001 | H2 | Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PRAIRIE RONDE	NE 1/4 NW 1/4 NW 1/4	28	04 S	12 W

Distance And Direction From Road Intersection
(1100' E OF 4TH STREET, 150' S OF K AVENUE
8811 W K AVENUE, SCHOOLCRAFT 49087)
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 890.00 msl

3 OWNER OF WELL: IRONS, JACK
Address: 8811 W K AVENUE
SCHOOLCRAFT, MI 49087
Address Same As Well Location? [x] Yes | | No

4 WELL DEPTH: 74.0 FT. | Date Completed 01/09/89 | [x] New Well | | Replacement Well

5 [x] Cable Tool | | Rotary | | Driven | | Dug
| | Hollow rod | | Auger/Bored | | Jetted

6 USE: [x]Domestic | |Type I Pub Ii: | |Type III Public
| |Irrigation | |Type II Public | |Heat Pump
| |Test Well | |Type IIb Public | |

7 CASING: [x] Steel | | Plastic | [x] Threaded | | Welded | Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 68.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Yes | | No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
GRAVEL	30	30
SAND & GRAVEL	20	50
GRAY CLAY & GRAVEL	15	65
COARSE SAND & GRAVEL	9	74

8 SCREEN | | Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.010 Length 6.0
Set between 68.00 ft. and 74.00 ft.
FITTINGS: | |K-Packer | |Bead Packer | |Bremner check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
25.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
75 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD
COMPLETION: [x]Pitless adapter | |12" above grade
| |Basement offset | |Approved pit

12 WELL GROUTED? | |No [x]Yes From to ft.
| |Neat cement [x]Bentonite | |Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type: Septic Distance 75 ft. Direction N
Well disinfected upon completion? | |Yes | |No
Was old well plugged? | |Yes | |No

14 PUMP: | |Not Installed | |Pump Installation Only
Manufacturer's name STA RITE
Model number HP .75 Volts
Length of Drop Pipe 42 ft. capacity 0 G.P.M.
TYPE: [x]Submersible | |Jet
|SUCTION TANK:
Manufacturers name
Model number Capacity 0 Gallons

15.Remarks,elevation,source of data,etc.
K-PACKER, SAMPLED 1989

Data Source: MDNR

17. Rig Operator's Name:

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.

0112
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

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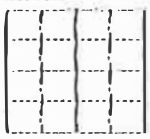
H3

1 LOCATION OF WELL 39741215002 | Tax Parcel |

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PRAIRIE RONDE	NE 1/4 NW 1/4 SW 1/4	35	04 S	12 W

Distance And Direction From Road Intersection
5100' E OF 7TH STREET, 250' S OF Y4 AVENUE
6767 W Y4 AVENUE, SCHOOLCRAFT 49087
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map



ELEVATION 885.00 msl

1 OWNER OF WELL: KIRVAN, RICK
Address: 6767 W Y4 AVENUE
SCHOOLCRAFT, MI 49087
Address Same As Well Location? [x] Yes [ ] No

3 WELL DEPTH: 76.0 FT. | Date Completed 05/31/64 | [x] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [x] Auger/Bored [ ] Jetted [ ] _____

6 USE [x]Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[ ]Heat Well [ ]Type IIb Public [ ] _____

7 CASING: [x] Steel [x] Threaded | Height: Above Surface 1.0 ft.
[ ] Plastic [ ] Welded
Diameter
4.00 in. to 72.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.010 Length 4.0
Set between 72.00 ft. and 76.00 ft.
FITTINGS: [ ]K-Packer [ ]Stead Packer [ ]Bronzer Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
40.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
40 ft. after 0.5 hrs. pumping at 60 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [ ]Bentonite [x]Other_____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name STA RITE
Model number HP .5 Volts
Length of drop Pipe 60 ft. capacity 8 G.P.M.
TYPE: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 4 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BLACK DIRT	2	2
BROWN CLAY	11	13
SAND	6	19
BROWN CLAY	9	28
SAND	12	40
GREY CLAY	25	65
WATER SAND	11	76

15. Remarks, elevation, source of data, etc.
12" ABOVE GRADE ALSO CHECKED

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME | 1711 REGISTRATION NO.

Address

Signed | Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 390412360011	H4	Tax Parcel #

County	Township Name	Fraction	Section	Town	Range
KALAMAZOO	PRAIRIE RONDE	SE 1/4 NW 1/4 NW 1/4	36	04 S	12 W

Distance And Direction From Road Intersection
620' N OF YA AVENUE, 50' E OF PRAIRIE RONDE
16162 PRAIRIE RONDE, SCHOOLCRAFT 49087
Street Address & City of Well Location

1 OWNER OF WELL: SCOTT, MARK
Address: 304 S CEDAR
SCHOOLCRAFT, MI 49087
Address Same As Well Location? [ ] Yes [x] No

Locate with 'X' in Section Below — Sketch Map

ELEVATION 850.00 msl

4 WELL DEPTH: 120.0 FT. | Date Completed 11/21/88 | [x] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Auger/Bored [ ] Jetted _____

6 USE [x]Domestic [ ]Type I Public [ ]Type III Public [ ]Irrigation [ ]Type II Public [ ]Heat Pump [ ]Test Well [ ]Type IIb Public [ ]_____

7 CASING: [x] Steel [x] Threaded [ ] Plastic [ ] Welded
Height: Above Surface 1.0 ft.
Diameter
4.00 in. to 116.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Grouted Drill Hole Diameter
8.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Drive Shoe [x] Ye [ ] No

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY & GRAVEL	15	15
WET SAND & GRAVEL	65	80
GRAY CLAY & GRAVEL	32	112
COARSE SAND	8	120

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 4.00
SLOT 0.010 Length 4.0
Set between 116.00 ft. and 120.00 ft.
FITTINGS: [ ]Packer [ ]Bead Packer [ ]Reducer Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
15 ft.after 1.0 hrs.pumping at 50 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]Basement offset [ ]12" above grade [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 65 ft. Direction N
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name STA RITE
Model number HP .5 Volts
Length of Drop Pipe 42 ft. capacity 10 G.P.M.
TYPE: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 10 Gallons

15.Remarks,elevation,source of data,etc.
R-PACKER, SAMPLED 1989

Data Source: MDNR

17. Rig Operator's Name:

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.

0112
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

1 LOCATION OF WELL 39741131091 | HS

Tax Parcel #

County	Township Name	Location	Section	Town	Range
KALAMAZOO	SCHOOLCRAFT	SE 1/4 NW 1/4 NW 1/4	11	04 S	11 W

Distance And Direction From Road Intersection
2150' N OF YZ AND 1200' W OF US 131
SCHOOLCRAFT 49087
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 865.00 msl

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	1	1
CLAY	3	4
DIRTY SAND	9	13
MEDIUM SAND	16	29
FINE SAND	11	40
MEDIUM SAND	20	60
SAND & GRAVEL	5	65
MEDIUM SAND	11	76
SAND & GRAVEL	10	95
MEDIUM SAND	1	96
SAND & GRAVEL	7	97

1 OWNER OF WELL: LANDIS, DEL BERT
Address
SCHOOLCRAFT, MI 49087
Address Same As Well Location? [x] Yes [ ] No

4 WELL DEPTH: 97.0 ft. | Date Completed 10/17/74 | [ ] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [ ] Domestic [ ] Type I Public [ ] Type III Public
[x] Irrigation [ ] Type II Public [ ] Heat Pump
[ ] Test Well [ ] Type IIb Public [ ]

7 CASING: [x] Steel [ ] Plastic | [ ] Threaded [x] Welded | Height: Above Surface 2.0 ft.
Diameter
12.00 in. to 77.0 ft. depth
0.00 in. to 0.0 ft. depth | Weight __ lbs/ft.
Grouted Drill Hole Diameter | Drive Shoe [x] Yes [ ] No
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 12.00
Slot 0.030 Length 20.0
Set between 77.00 ft. and 97.00 ft.
FITTINGS: [ ] K-Packer [ ] Lead Packer [ ]Bremner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
15.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
50 ft. after 8.0 hrs. pumping at 979 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ]Pitless adapter [x]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [x]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other
No. of bags of cement ___ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [x]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

15. Remarks, elevation, source of data, etc.

Data Source: MDNR

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 1259

Address

Signed AUTHORIZED REPRESENTATIVE — Date

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WATER WELL AND PUMP RECORD

H6

LOCATION OF WELL	25251195091			Tax Parcel	175-1
County: ST. JOSEPH	Township Name: PARK	Direction: SW 1/4 SE 1/4 NW 1/4	Section: 05	Town: 05 S	Range: 11 W

Distance And Direction From Road Intersection: 1360 FT. N. OF ROSEBUD RD. 1100 FT. W. OF QUAKE RD.

Street Address & City of Well Location:

Locate with 'X' in Section Below — Sketch Map

ELEVATION 855.00 msl

1 OWNER OF WELL: DON KLEIN
Address: 15691 NORTH ST, THREE RIVERS, MI 49093
Address Same As Well Location? | | Yes |x| No

4 WELL DEPTH: 82.0 FT. | Date Completed: 04/25/85 | | | New Well | | | Replacement Well

5 | | Cable Tool |x| Rotary | | Driven | | Dug | | Hollow rod | | Auger/Bored | | Jetted

6 USE | Domestic | | Type I Public | | Type III Public Institution | Type II Public | | Heat Pump | | Irrig. Well | | Type IV Public

7 CASING: |x| Steel | | Threaded | | Plastic |x| Welded
Diameter: 12.00 in. to 62.0 ft. depth; 8.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter: 12.00 in. to 82.0 ft. depth; 8.00 in. to 0.0 ft. depth
Height: Above Surface 1.0 ft.
Weight __ lbs/ft.
Drive Shoe | | Yes |x| No

8 SCREEN | | Not Installed
Type Stainless Steel — Diameter 10.75
Slot 0.060 — Length 20.0
Set between 62.00 ft. and 82.00 ft.
FITTINGS: | K-Packer | Dead Packer | Drawdown Check | | Blank above screen 0.0 ft. | Other

9 STATIC WATER LEVEL: 18.00 ft. below land surface | | Flow

10 PUMPING LEVEL: below land surface
38 ft. after 4.0 hrs. pumping at 817 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: | Pitless adapter |x| 12" above grade | | Basement offset | Approved pit

12 WELL GROUTED? | | Unknown |x| Yes From to ft.
| Neat cement |x| Bentonite | Other
No. of bags of cement __ Additives __

13 Nearest source of possible contamination: Type None Distance 400 ft. Direction
Well disinfected upon completion? |x| Yes | | No
Was dwell plugged? | | Yes | | No

14 PUMP: | Not Installed | Pump Installation Only
Manufacturer's name WESTERN LA
Model number WP 60 Volts
Length of Drop Pipe 50 ft. Capacity 800 G.P.M.
TYPE: | Submersible |x| Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 300 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM		
TOP SOIL	1	1		
BROWN FINE TO MEDIUM SAND	21	22		
GREY MEDIUM TO MEDIUM GRAVEL	11	33		
GREY COARSE SAND & GRAVEL	5	38		
GREY FINE SAND	3	41		
GREY MEDIUM SAND TO COARSE GRAVEL	8	49		
GREY FINE SAND	9	58		
GREY SOFT CLAY	1	59		
GREY COARSE SAND & GRAVEL	7	66		
GREY CLAY	2	68		
GREY COARSE SAND & GRAVEL	12	80		
GREY MEDIUM SAND (STONES)	1	81		

15. Remarks, elevation, source of data, etc.

Data Source: Michigan Groundwater Survey

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.

0550
REGISTERED BUSINESS NAME — REGISTRATION NO.

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

17. Rig Operator's Name:

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WATER WELL AND PUMP RECORD

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H7

1 LOCATION OF WELL 7575111200I | Tax Parcel # 0112-1

County: ST. JOSEPH | Township Name: LARE | Fraction: NE 1/4 SW 1/4 NW 1/4 | Section: 12 | Town: 05 S | Range: 11 W

Distance And Direction From Road Intersection
S W. OF MICHIGAN AVE.
51261 FARMVILLE Rd, SCHOOLCRAFT 49087
Street Address & City of Well Location

Locate with 'X' in Section Below | Sketch Map

ELEVATION 845.00 msl

2 OWNER OF WELL: DETROIT HOUSES (CONTRACTOR)
Address: 4410 AVE
LAKEVIEW, MI 49065
Address Same As Well Location? | | Yes | | No

3 WELL DEPTH: 100.0 FT. | Date Completed: 05/16/84 | | | New Well | | Replacement Well

4 [x] Cable Tool | | Rotary | | Driven | | Dug | | Hollow rod | | Auger/Bored | | Jetted

5 USE: [x] Domestic | Type I Public | Type III Public | | Irrigation | Type II Public | Test Pump | | Test Well | Type IV Public | |

6 CASING: | | Steel [x] Threaded | | | Plastic | | Welded
Diameter
4.00 in. to 96.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted? [x] Yes | | No
Grouted Wall Hole Diameter
6.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Height: Above Surface 1.0 ft.
Weight __ lbs/ft.
Drive Shoe [x] Yes | | No

7 SCREEN | | Not Installed
Type Stainless Steel Diameter 4.00
Slot 0.010 Length 4.0
Set Between 96.00 ft. and 100.00 ft.
FITTINGS: | Re-Packer | Bead Packer | Reverse Check
| | Blank above screen 0.0 ft. Other

8 STATIC WATER LEVEL:
8.00 ft. below land surface | | Flow

9 PUMPING LEVEL: below land surface
? ft. after 1.0 hrs. pumping at 50 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

10 WELL HEAD
COMPLETION: [x] Pitless adapter | | 12" above grade
| | Basement offset | | Approved pit

11 WELL GROUTED? | | No [x] Yes From to ft.
| | Neat cement [x] Bentonite | | Other
No. of bags of cement Additives

12 Nearest source of possible contamination
Type Septic Distance 90 ft. Direction E
Well disinfected upon completion? [x] Yes | | No
Was old well plugged? | | Yes | | No

13 PUMP: | | Not Installed | | Pump Installation Only
Manufacturer's name STA RITE
Model number HP .5 Volts
Length of Pump Pipe 61 ft. Capacity 14 G.P.M.
Type: [x] Submersible | | Turbine
PRESSURE TANK:
Manufacturers name
Model number Capacity 14 Gallons

Formation Description	Thickness of Stratum	Depth of Bottom of Stratum
DRY GRAVEL	10	10
WET GRAVEL	25	35
GREY CLAY & GRAVEL	50	85
SOFT GREY CLAY	5	90
GREY CLAY & GRAVEL HARD	5	95
COARSE SAND	5	100

15. Remarks, elevation, source of data, etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

0112
REGISTERED BUSINESS NAME REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

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H8

1 LOCATION OF WELL 75751007001 | Tax Parcel # ME7-1

County	Township Name	Fraction	Section	Town	Range
ST. JOSEPH	MENDON	SW 1/4 NE 1/4 SW 1/4	07	05 S	10 W

Distance And Direction From Road Intersection
1000 FT N. OF MICHIGAN AVE. ON SILVER ST. THEN 100 FT E

Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 845.00 msl

1 OWNER OF WELL: KLINE RESORT (PAUL)
Address: 22460 KLINE RESORT, THREE RIVERS, MI 49093
Address Same As Well Location? [ ] Yes [ ] No

4 WELL DEPTH: 66.0 FT. | Date Completed: 04/21/82 | [ ] New Well [ ] Replacement Well

5 [x] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted

6 USE [ ]Domestic [ ]Type I Public [ ]Type III Public
[ ]Irrigation [ ]Type II Public [ ]Heat Pump
[ ]Test Well [ ]Type IIb Public [x]Other Public

7 CASING: [ ] Steel [x] Threaded [ ] Plastic [x] Welded
Diameter
6.00 in. to 56.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Height: Above Surface 0.0 ft.
Weight __ lbs/ft.
Drive Shoe [ ] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 5.00
Make 15.000 Length 10.0
Set between 56.00 ft. and 66.00 ft.
FITTINGS: [ ]K-Packer [ ]Bead Packer [ ]Brenner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
17.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: Below land surface
0 ft. after 0.0 hrs. pumping at 0 G.P.M.
0 ft. after 0.0 hrs. pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other
No. of bags of cement __ Additives

13 Nearest source of possible contamination
Type Unknown Distance 0 ft. Direction
Well disinfected upon completion? [ ]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name
Model number HP Volts
Length of Drop Pipe 0 ft. Capacity 0 G.P.M.
TYPE: [ ]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND	10	10
SAND & GRAVEL	10	20
GRAVEL	10	30
SAND	16	46
CLAY	8	54
SAND	12	66
SOFT SHALE STOPPED DRILLING AT 66 FT	20	86

15. Remarks, elevation, source of data, etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

1696
REGISTERED BUSINESS NAME * REGISTRATION NO.

Address

Signed Date
AUTHORIZED REPRESENTATIVE

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WATER WELL AND PUMP RECORD

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1 LOCATION OF WELL 75751009001 | H9 | Tax Parcel # ME9-1

County	Township Name	Fraction	Section	Town	Range
ST. JOSEPH	MENDON	SE 1/4 NE 1/4 SE 1/4	09	05 S	10 W

Distance And Direction From Road Intersection
ABOUT .3 MI N. OF E. MICHIGAN AVE. ONTHE W. SIDE OF FUL
LER RD. 51678 FULLER RD, MENDON 49072
Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map

ELEVATION 870.00 msl

1 OWNER OF WELL — TOM SCHRODER
Address — FULLER RD.
MENDON, MI 49072
Address Same As Well Location? [ ] Yes [ ] No

4 WELL DEPTH: 93.0 FT. | Date Completed 12/29/77 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [x] Auger/Bored [ ] Jetted [ ] _____

6 USE [x]Domestic [ ]Irrigation [ ]Test Well | [ ]Type I Public [ ]Type II Public [ ]Type IIb Public | [ ]Type III Public [ ]Heat Pump [ ]_____

7 CASING: [ ] Steel [ ] Plastic [x] Threaded [ ] Welded | Height: Above Surface 1.0 ft.
Diameter
2.00 in. to 87.0 ft. depth
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter
0.00 in. to 0.0 ft. depth
0.00 in. to 0.0 ft. depth
Weight __ lbs/ft.
Drive Shoe [x] Yes [ ] No

8 SCREEN [ ] Not Installed
Type Other — Diameter 1.25
CAUGE 60.000 — Length 5.0
Set between 88.00 ft. and 93.00 ft.
FITTINGS: [ ]K-Packer [ ]Lead Packer [x]Bronner Check
[x] Blank above screen 1.0 ft. Other

9 STATIC WATER LEVEL:
40.00 ft. below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 0.0 hrs.pumping at 0 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [x]Pitless adapter [ ]Basement offset | [ ]12" above grade [ ]Approved pit

12 WELL GROUTED? [ ]No [ ]Yes From to ft.
[ ]Neat cement [ ]Bentonite [ ]Other _____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type Septic Distance 68 ft. Direction NW
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name FLINT & WA
Model number HP 1 Volts
Length of Drop Pipe 76 ft. capacity 0 G.P.M.
TYPE: [ ]Submersible [x]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 0 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
RED CLAY	4	4
YELLOW SAND	44	48
RED CLAY	15	63
BLUE CLAY	25	88
COARSE SAND	5	93

15. Remarks, elevation, source of data, etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 1538

Address

Signed — AUTHORIZED REPRESENTATIVE — Date

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WATER WELL AND PUMP RECORD

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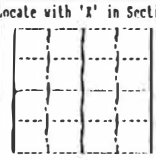
1 LOCATION OF WELL 75751011001 | H10 | Tax Parcel | MEII-1

County	Township Name	Fraction	Section	Town	Range
ST. JOSEPH	MENDON	SE 1/4 SW 1/4 NW 1/4	11	05 S	10 W

Distance And Direction From Road Intersection
2700 FT. N. OF MICHIGAN AVE. 1300 FT. E. OF OSGOOD RD.

Street Address & City of Well Location

Locate with 'X' in Section Below — Sketch Map



ELEVATION 873.00 msl

3 OWNER OF WELL: MR. CARROLL HAAS C&J FARMS
Address: PO BOX 248
MENDON, MI 49072
Address Same As Well Location? [ ] Yes [x] No

4 WELL DEPTH: 169.0 FT. | Date Completed 07/30/84 | [ ] New Well [ ] Replacement Well

5 [ ] Cable tool [x] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Auger/Bored [ ] Jetted ____

6 USE [ ]Domestic [ ]Type I Public [ ]Type III Public
[x]Irrigation [ ]Type II Public [ ]Heat Pump
[ ]Test Well [ ]Type IIb Public [ ]_____

7 CASING: [x] Steel [ ] Threaded | Weight: Above Surface 2.0 ft.
[ ] Plastic [ ] Welded
Diameter
6.00 in. to 159.0 ft. depth | Weight __ lbs/ft.
0.00 in. to 0.0 ft. depth
Grouted Drill Hole Diameter | Drive Shoe [ ] Yes [x] No
10.00 in. to 169.0 ft. depth
0.00 in. to 0.0 ft. depth

8 SCREEN [ ] Not Installed
Type Stainless Steel Diameter 6.00
SLOT 0.025 Length 10.0
Set between 159.00 ft. and 169.00 ft.
FITTINGS: [ ]K-Packer [ ]Bead Packer [ ]Brenner Check
[ ] Blank above screen 0.0 ft. Other

9 STATIC WATER LEVEL:
2.00 ft. Below land surface [ ] Flow

10 PUMPING LEVEL: below land surface
0 ft.after 2.0 hrs.pumping at 300 G.P.M.
0 ft.after 0.0 hrs.pumping at 0 G.P.M.

11 WELL HEAD COMPLETION: [ ]Pitless adapter [x]12" above grade
[ ]Basement offset [ ]Approved pit

12 WELL GROUTED? [ ]No [x]Yes From to ft.
[ ]Neat cement [x]Bentonite [ ]Other_____
No. of bags of cement __ Additives _____

13 Nearest source of possible contamination
Type None Distance 750 ft. Direction
Well disinfected upon completion? [x]Yes [ ]No
Was old well plugged? [ ]Yes [ ]No

14 PUMP: [ ]Not Installed [ ]Pump Installation Only
Manufacturer's name LAING & HO
Model number HP 10 Volts
Length of Drop Pipe 84 ft. capacity 350 G.P.M.
TYPE: [x]Submersible [ ]Jet
PRESSURE TANK:
Manufacturers name
Model number Capacity 350 Gallons

2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
TOP SOIL	2	2
BROWN SANDY CLAY	3	5
BROWN COARSE SAND & GRAVEL	2	7
GRY CLAY	9	16
BROWN CLAY & GRAVEL	14	30
BROWN HARD CLAY	40	75
GREY GRAVELY CLAY	4	79
GREY CLAY	78	157
GREY COARSE SAND & GRAVEL	18	175
BLUE SHALE (STOPPED)	1	176

15.Remarks,elevation,source of data,etc.

Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

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.

REGISTERED BUSINESS NAME — REGISTRATION NO. 0550

Address

Signed — Date
AUTHORIZED REPRESENTATIVE

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