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

by

Kim Finkbeiner

A Thesis
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Master of Science
Department of Geology

Western Michigan University
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I also wish to thank my friends and family for their encouragement. Hanna also deserves acknowledgement for enduring numerous weekend hours at the office with love and a smile. My deepest gratitude is extended to my husband, Bill, for his love, advice, support, and eventual inspiration to finish.

Kim Finkbeiner

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

Kim Finkbeiner, M.S.

Western Michigan University, 1994

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 constructed 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,

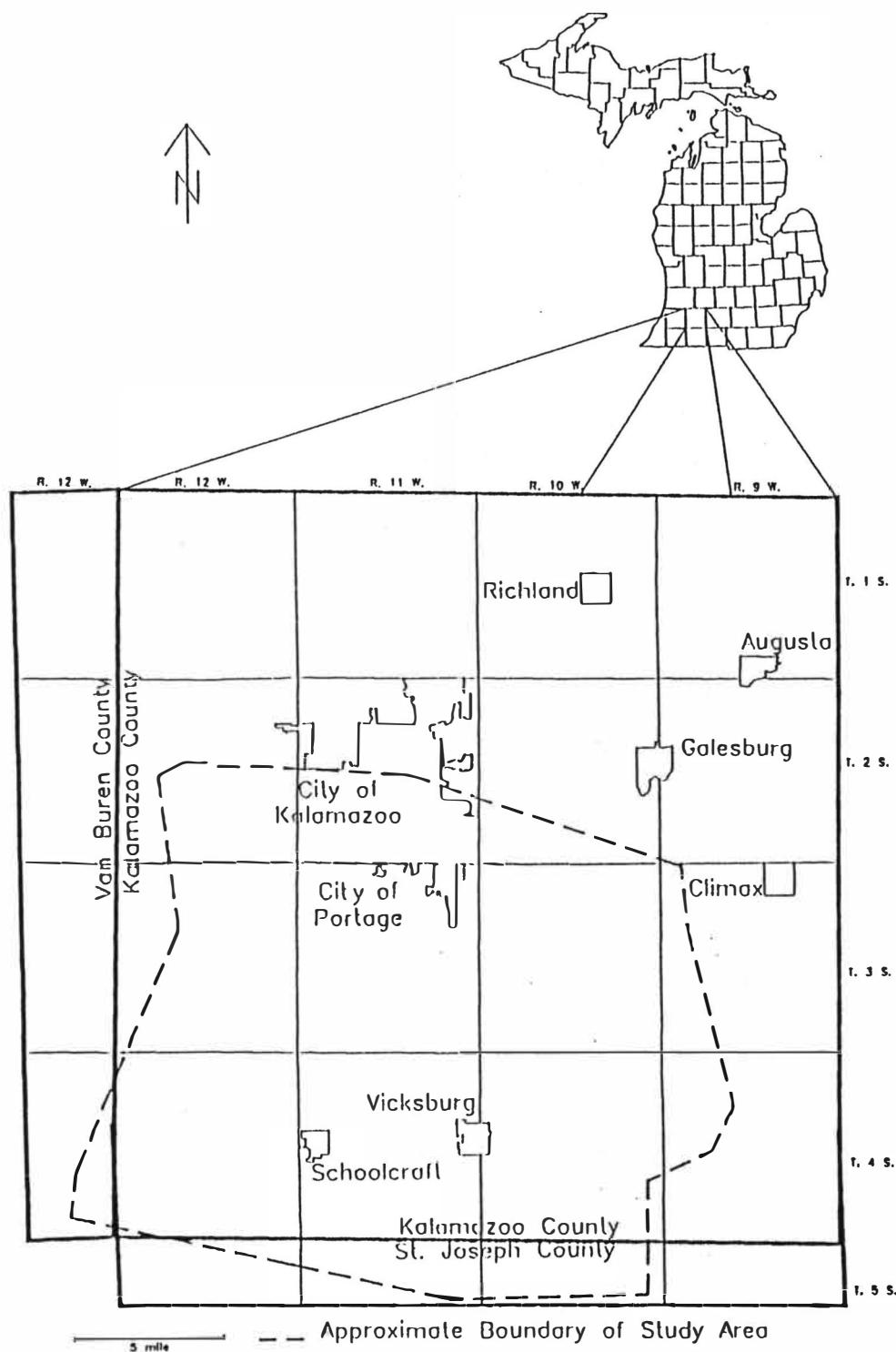


Figure 1. Location of Study Area.

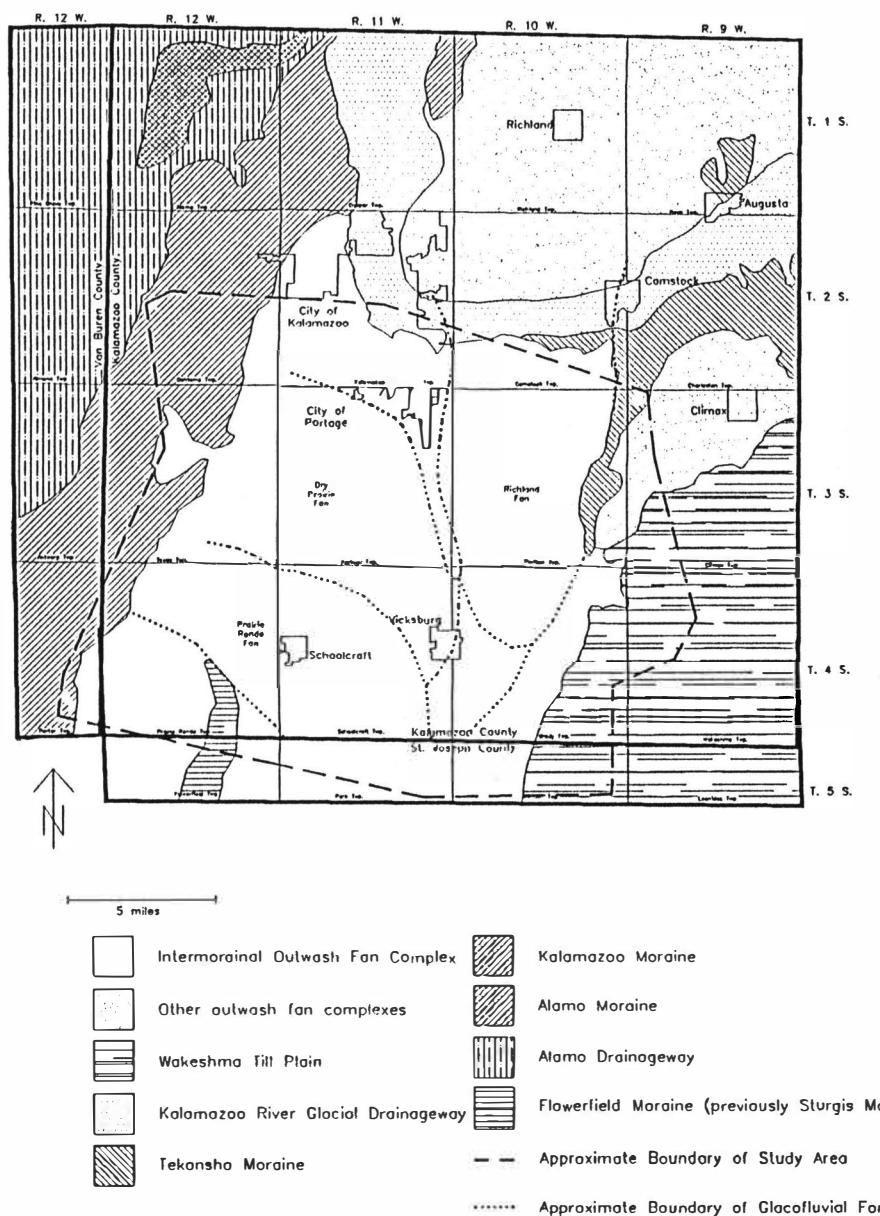


Figure 2. Map of Surficial Glacial Features (modified from Martin, 1955; Shah, 1971).

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.

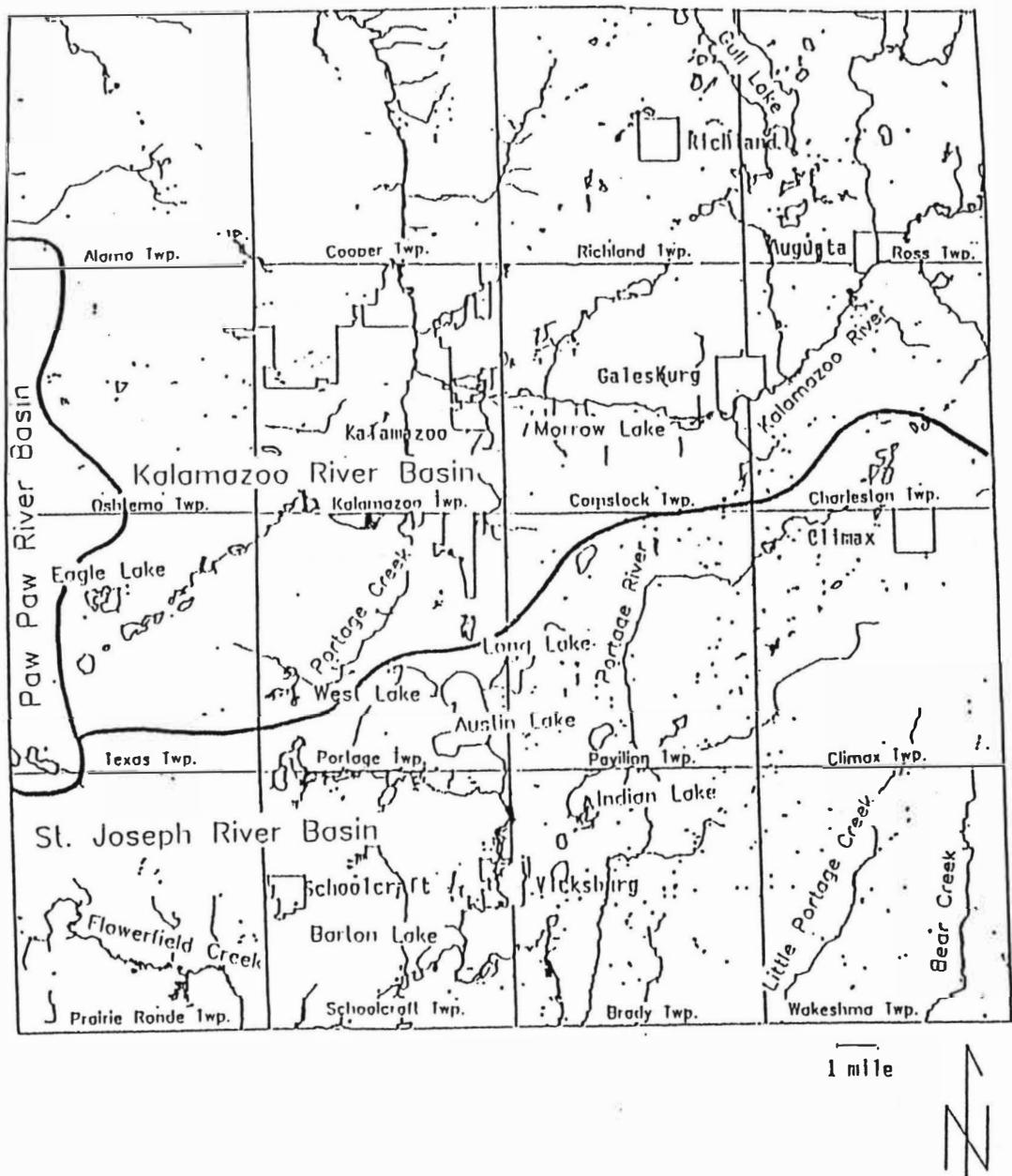
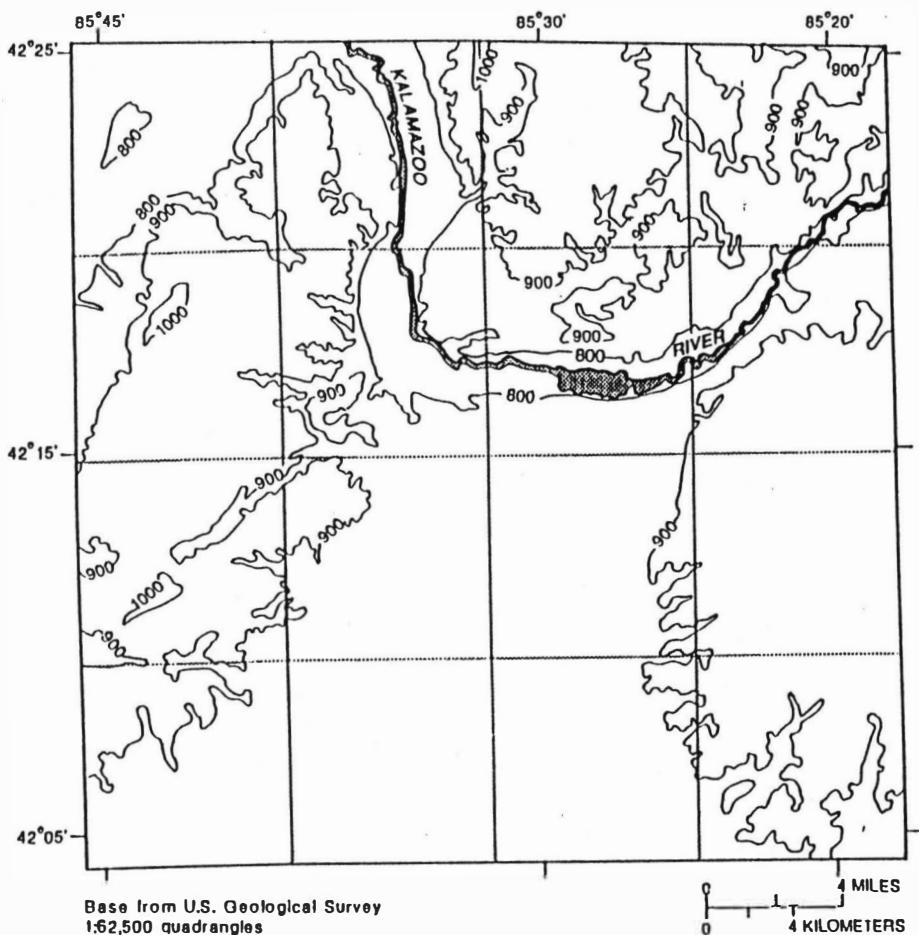


Figure 3. Map of Surface Water Features in Kalamazoo County (digitized map from the Michigan Resource Inventory System, MIRIS Groundwater Database).

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 (Lillenthal, 1978).

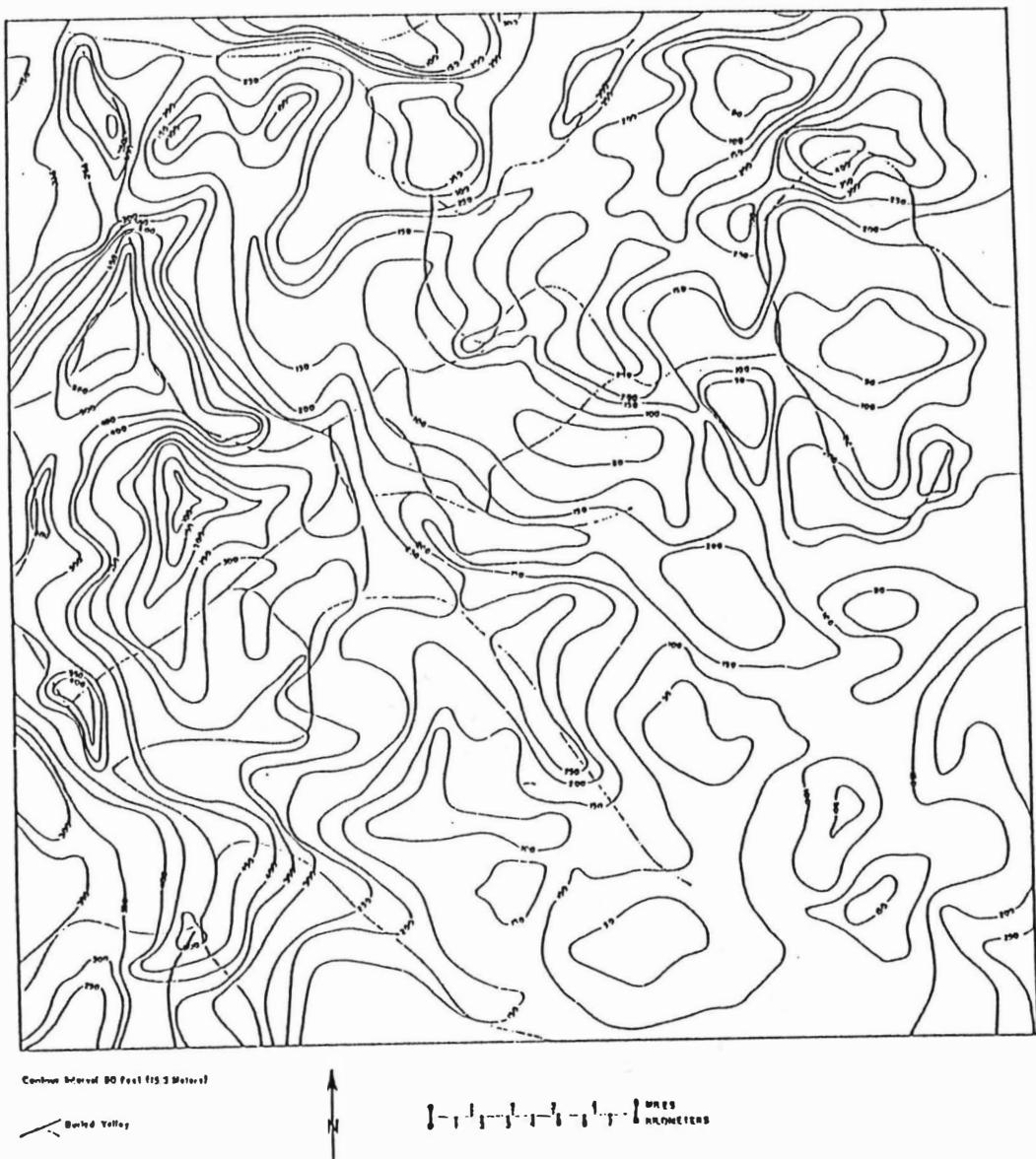


Figure 5. Map of Drift Thickness (Western Michigan University, 1978).

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 apparently 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.

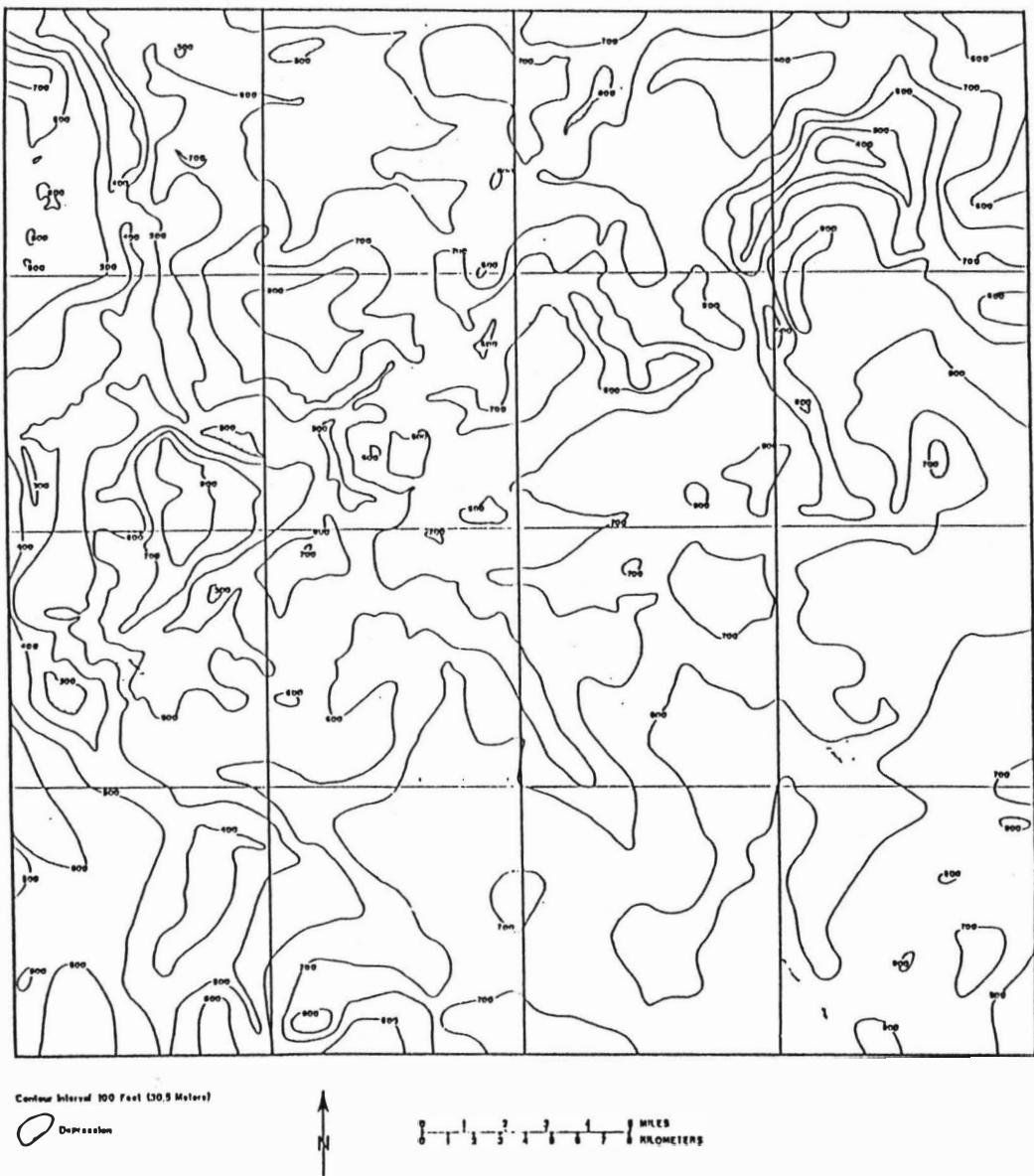


Figure 6. Map of Bedrock Topography (Western Michigan University, 1978; originally adapted from Ibrahim, 1970).

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 its 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

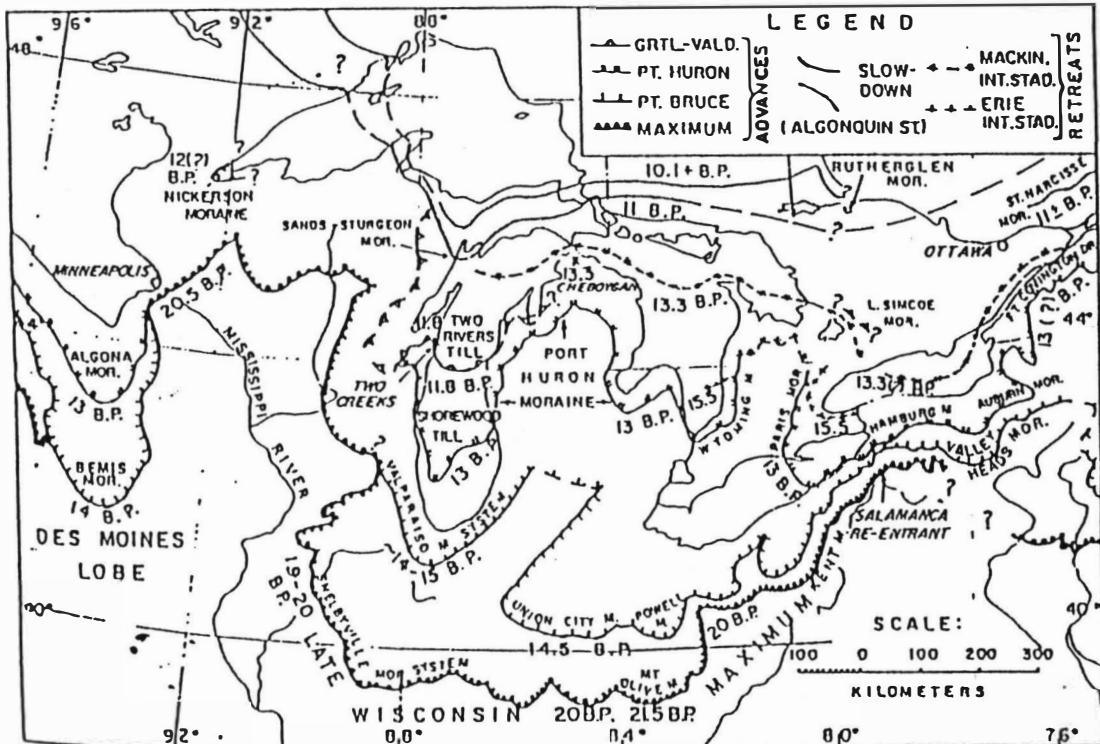


Figure 7. Maximum Extent of Wisconsinan Advance of Ice (Dreimanis, 1977).

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

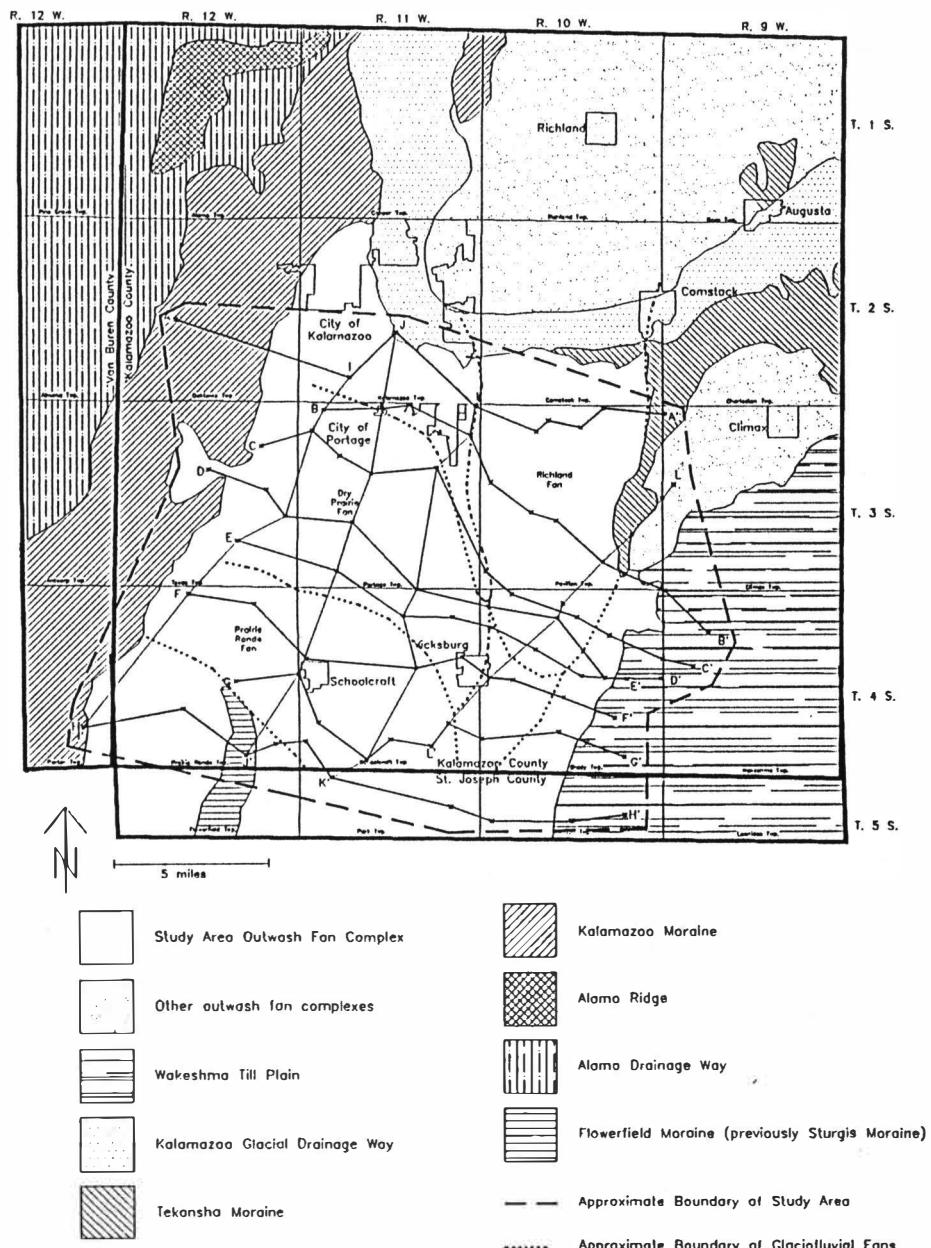


Figure 8. Map of Location of Cross Section Lines.

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

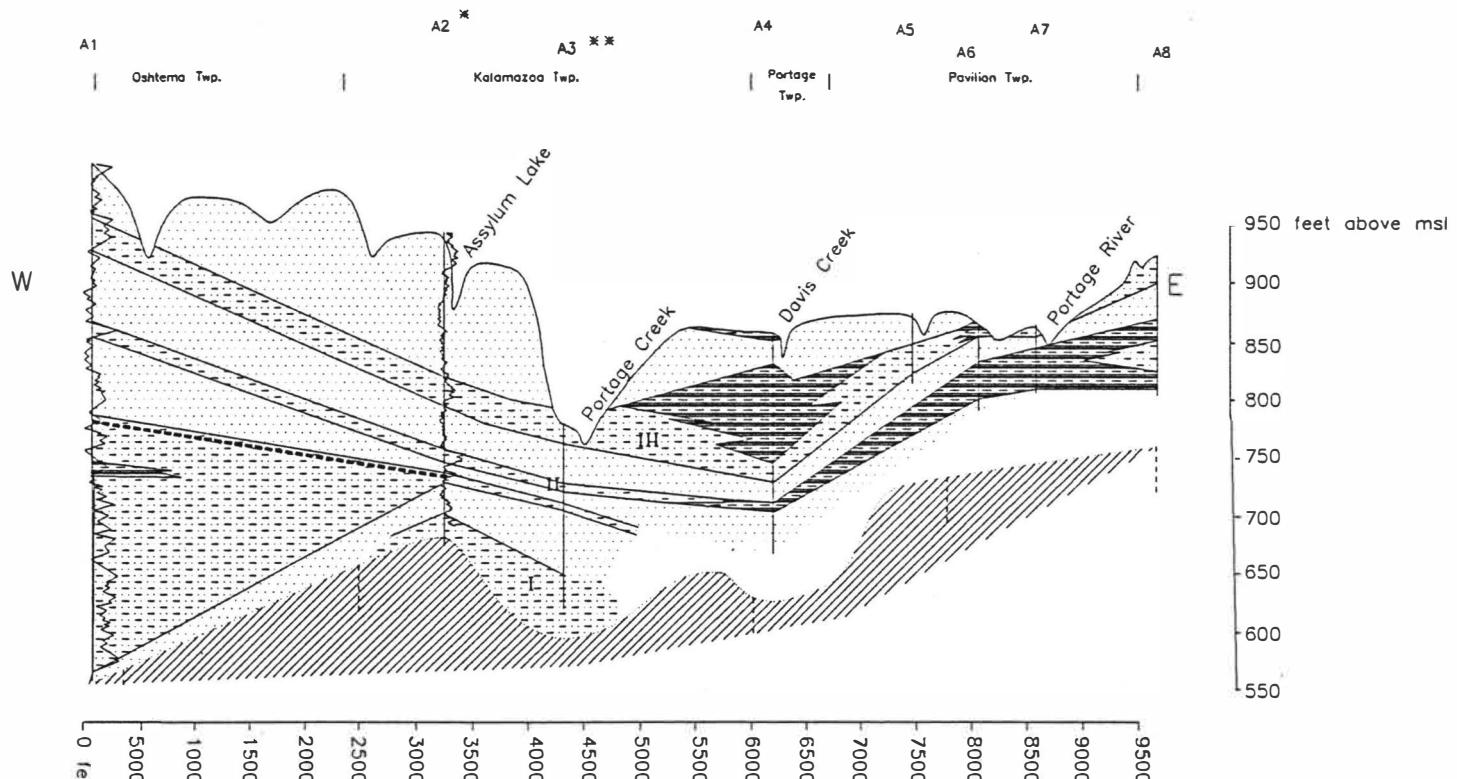
The cross section depicts four distinct till units. The far western well (A1) shows at least three till units within this area of the Kalamazoo Moraine. Nearby wells indicated complex deposition in this area with additional till units in the immediate vicinity of this well. The nearby well records also 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



* W.M.U. Geology Department test wells
 ** City of Kalamazoo wells
 (all others are domestic water wells)
 A minimum of 19 well records were used to create this cross section.

----- Approximate location of assumed paleosol
 Estimated bedrock surface (Ibrahim, 1970)
 (vertical dashed lines show where oil well logs
 were used for depth to bedrock control)

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.

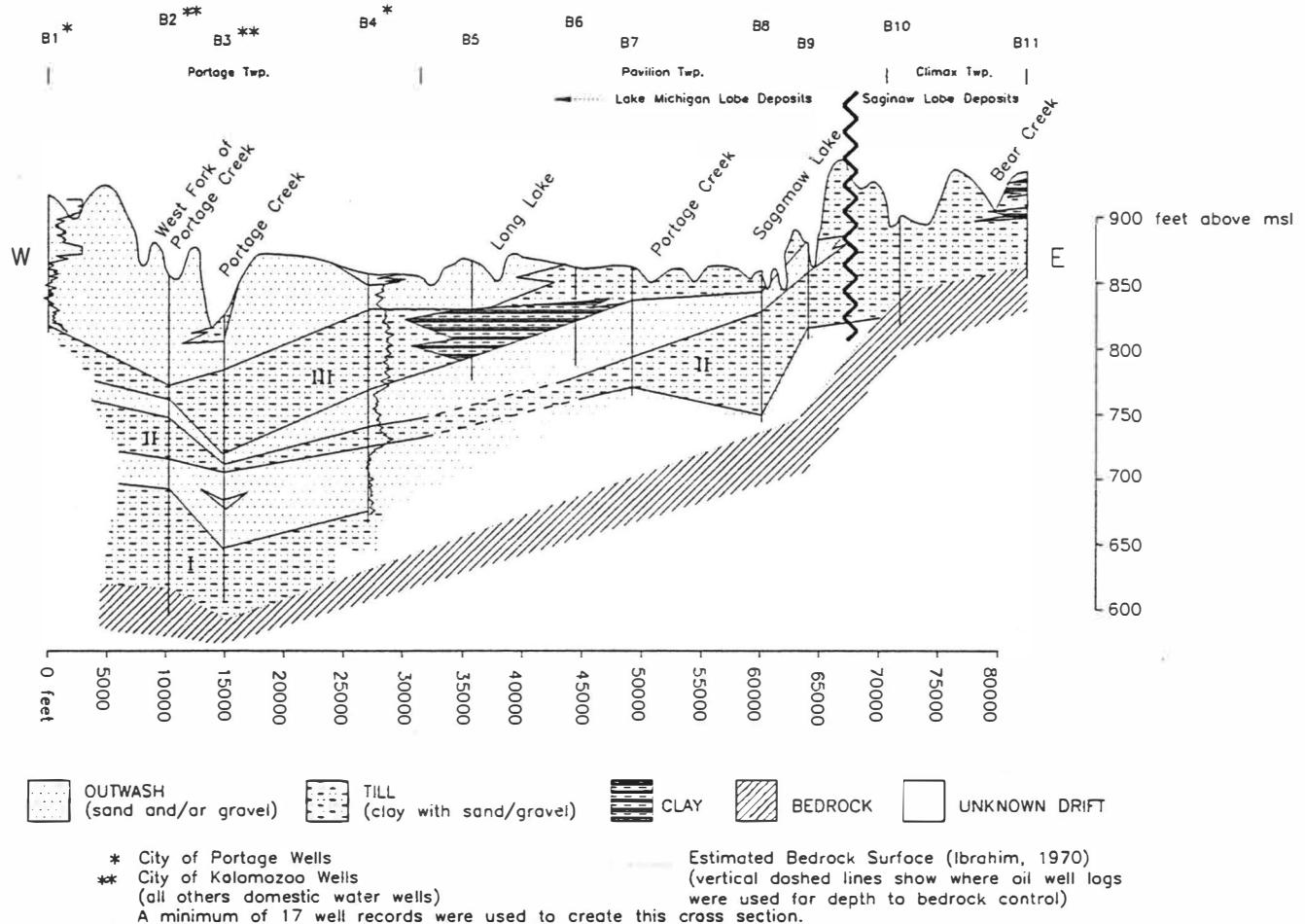


Figure 10. Cross Section B-B'.

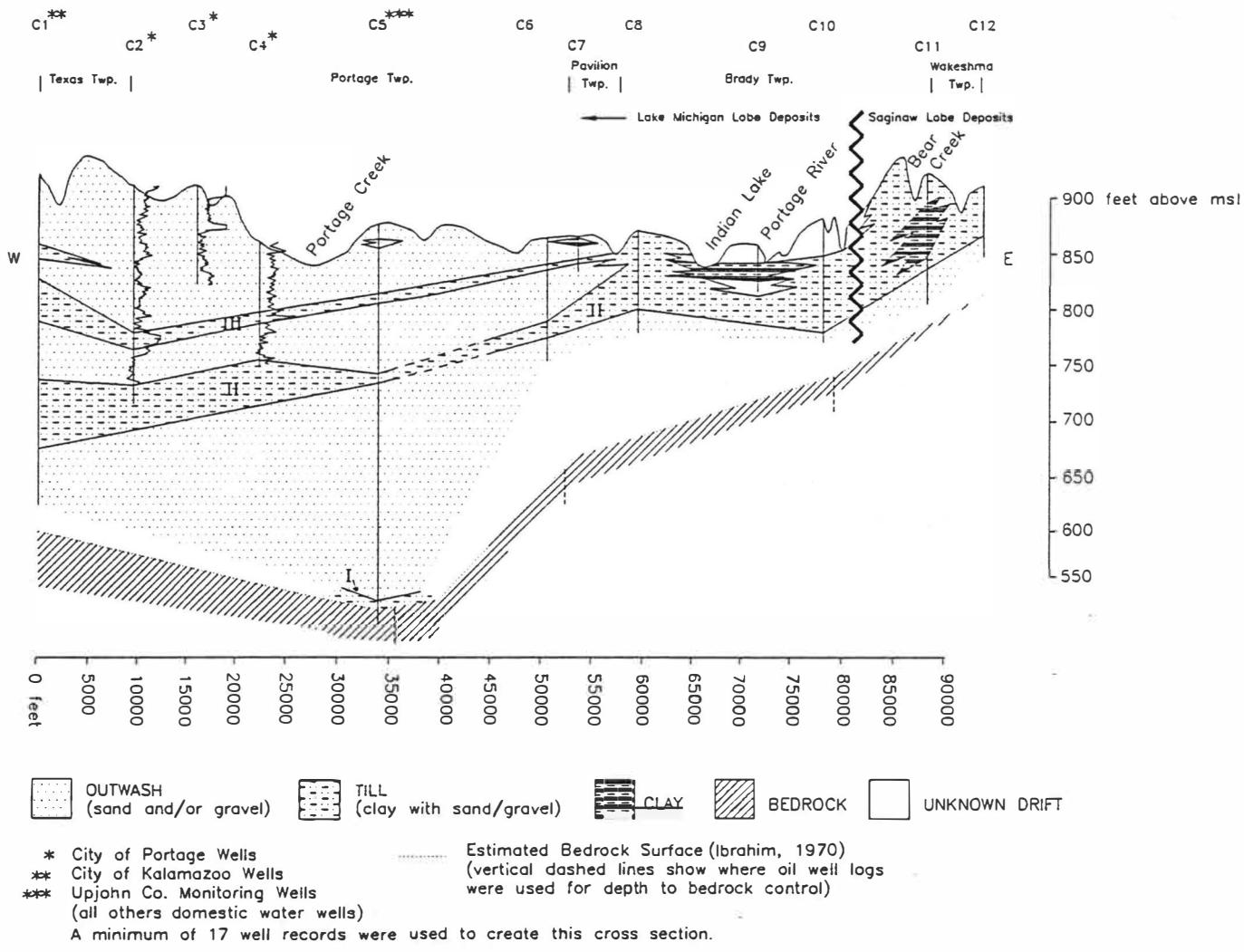


Figure 11. Cross Section C-C'.

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.

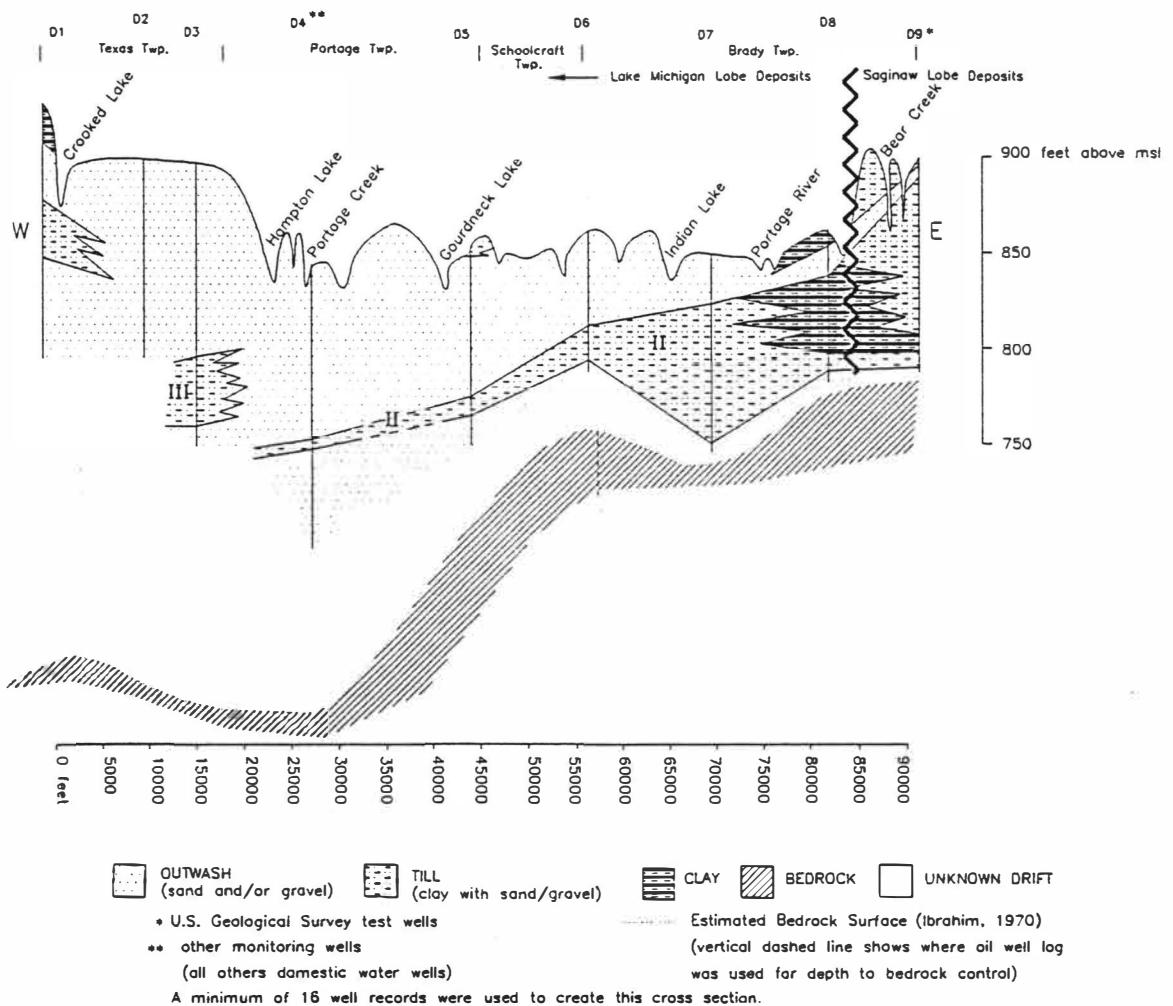


Figure 12. Cross Section D-D'.

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

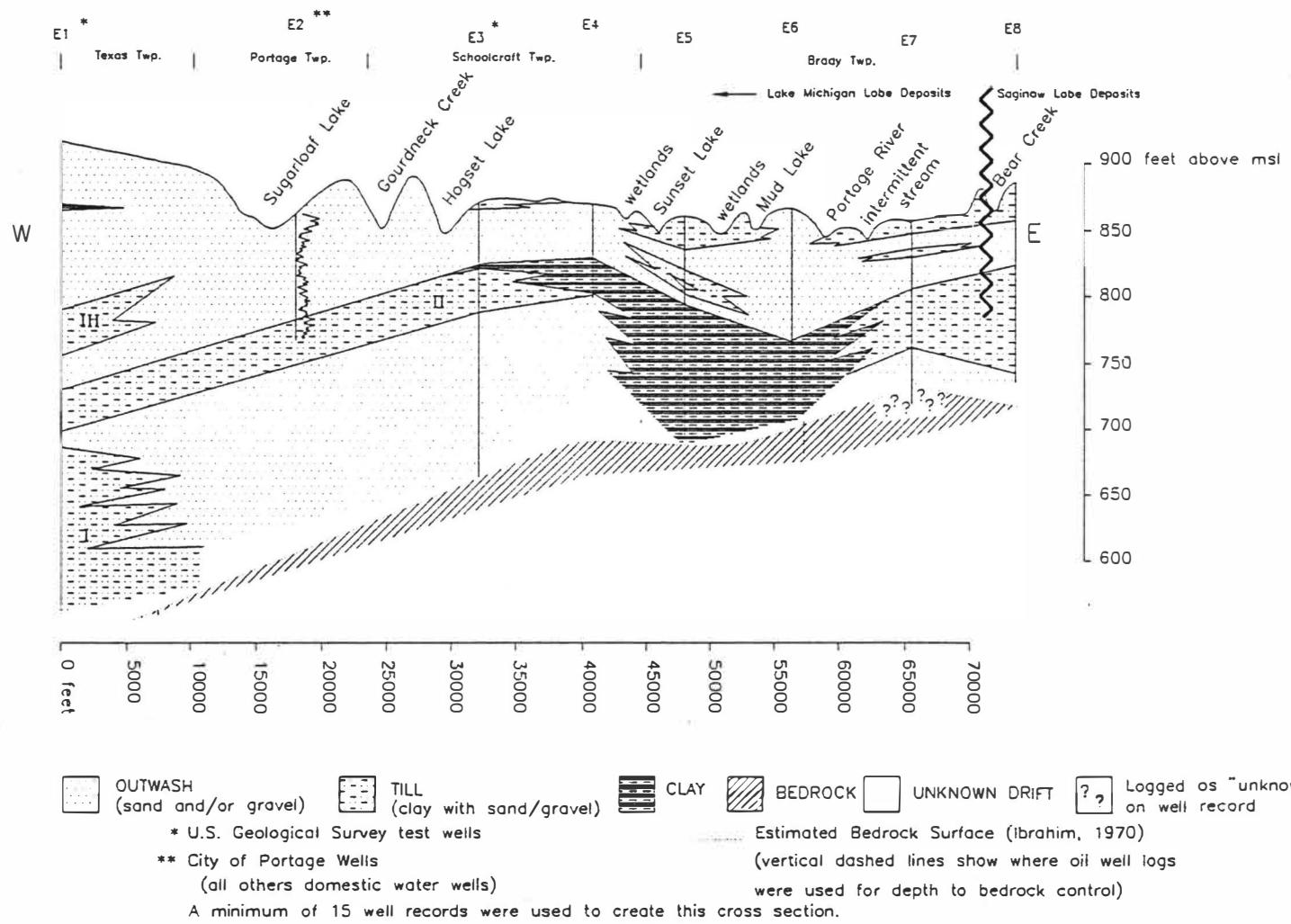


Figure 13. Cross Section E-E'.

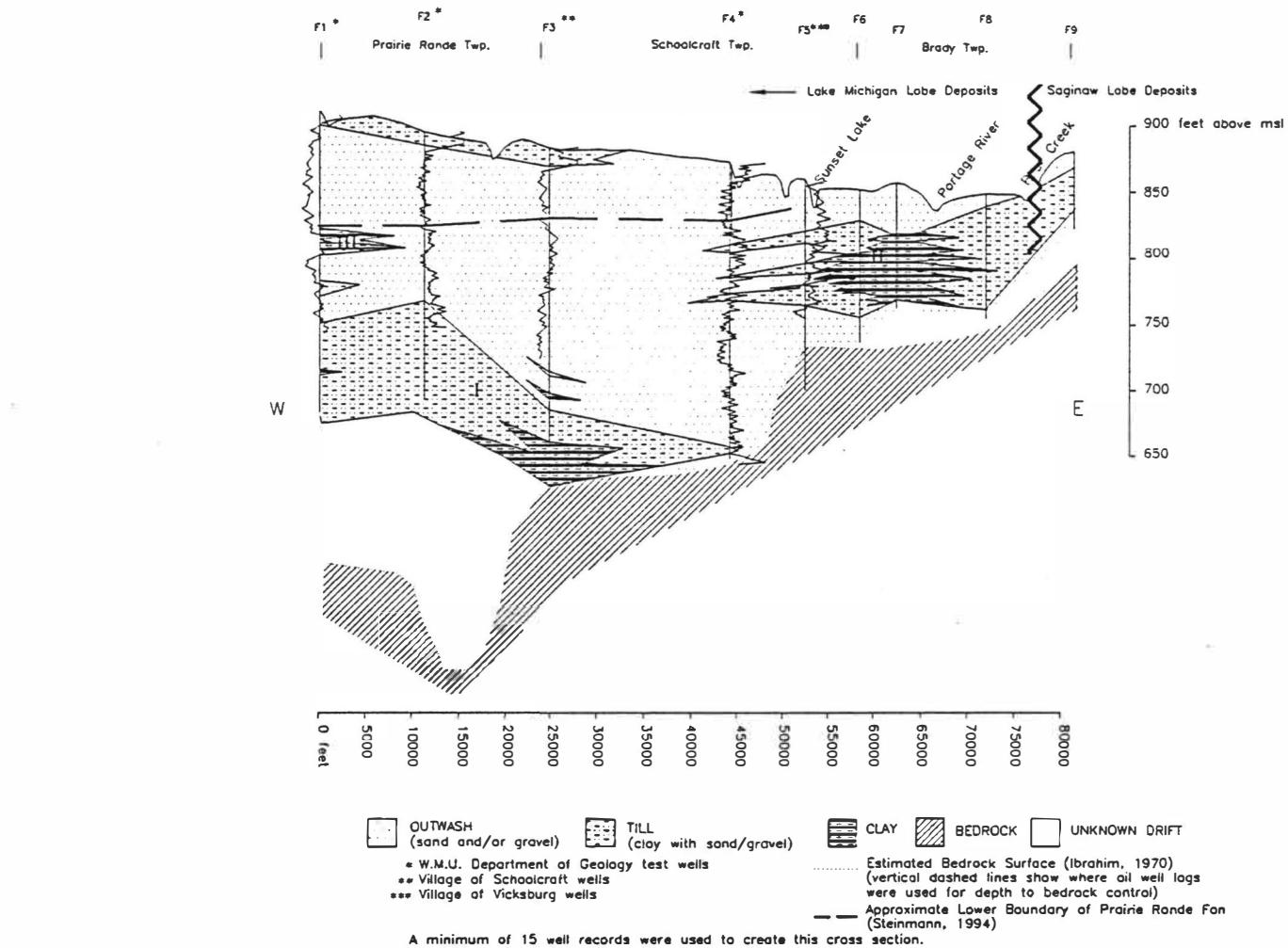


Figure 14. Cross Section F-F'.

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'

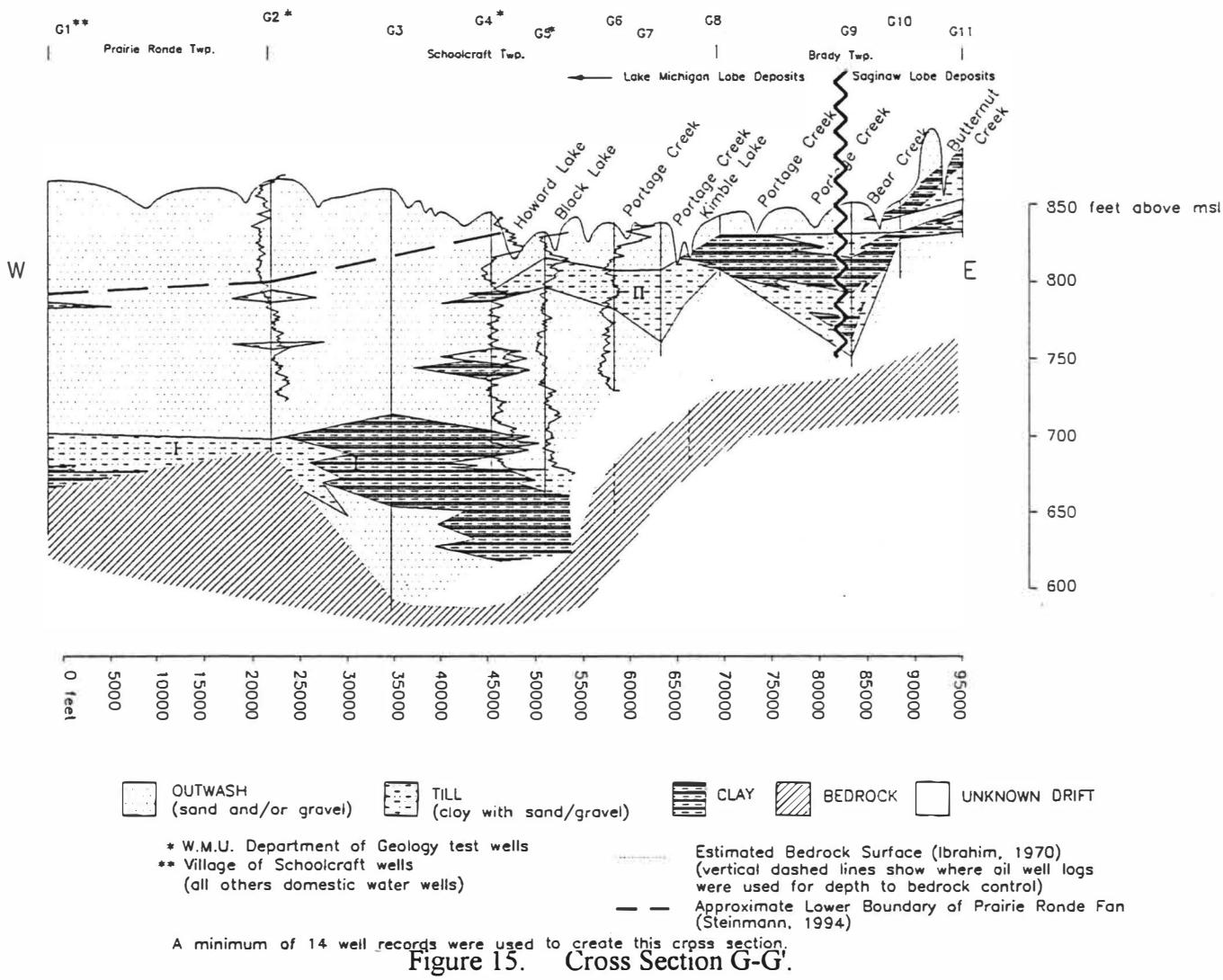
Cross section G-G' transects the study area in Kalamazoo County from west-central Prairie Ronde Township through Schoolcraft Township and into Brady Township, ending on the Wakeshma till plain (Figure 15).

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



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.

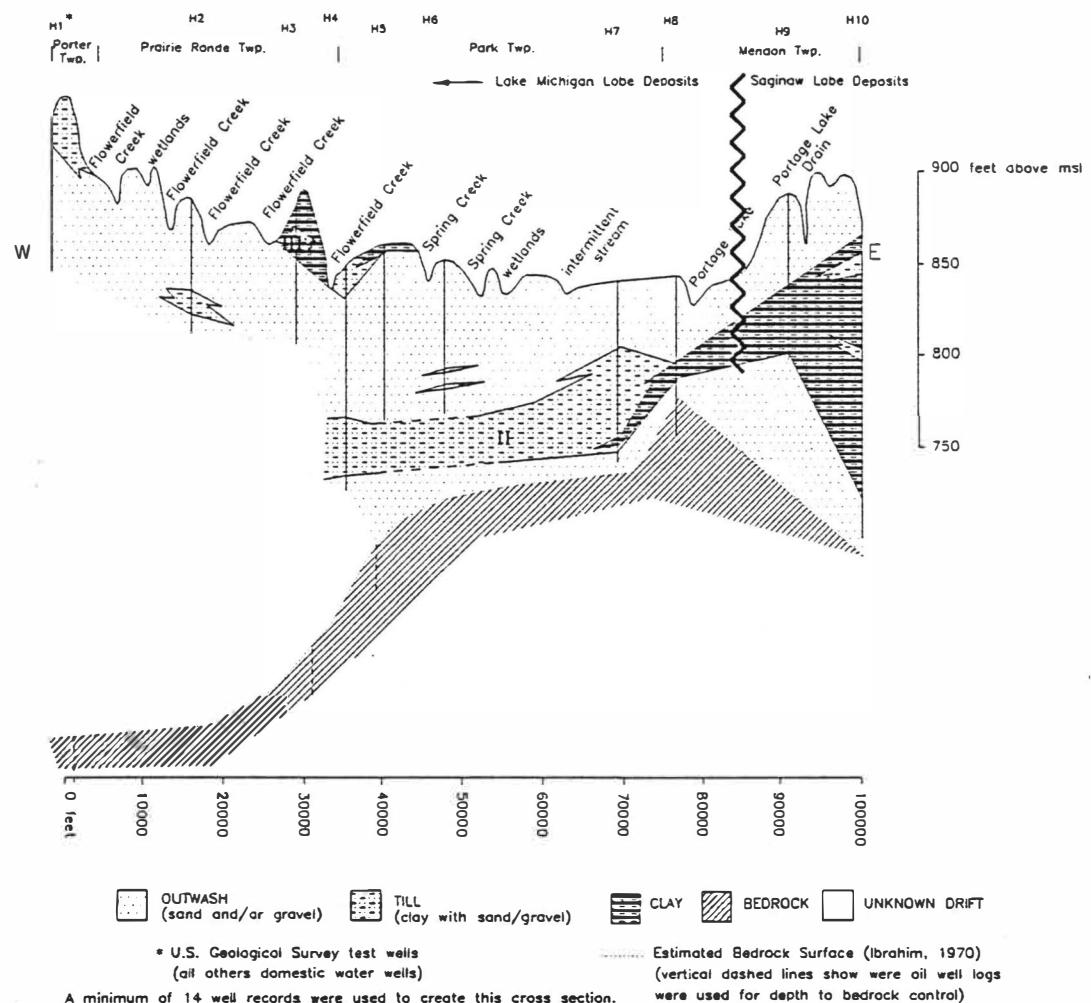


Figure 16. Cross Section H-H'.

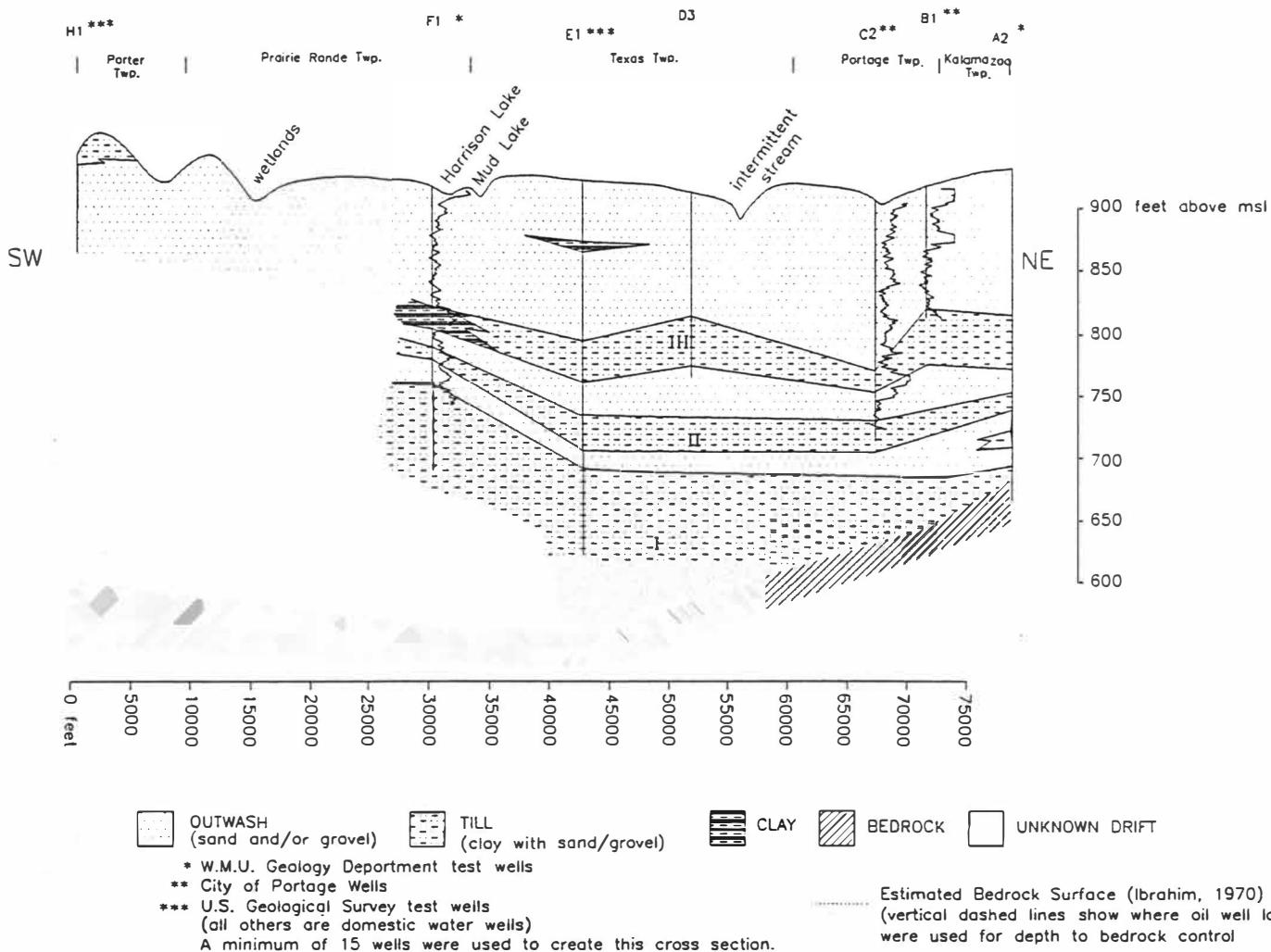


Figure 17. Cross Section I-I'.

Cross Section J-J'

Cross section J-J' transects the west-central part of the intermorainal area with a northeast-southwest orientation 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.

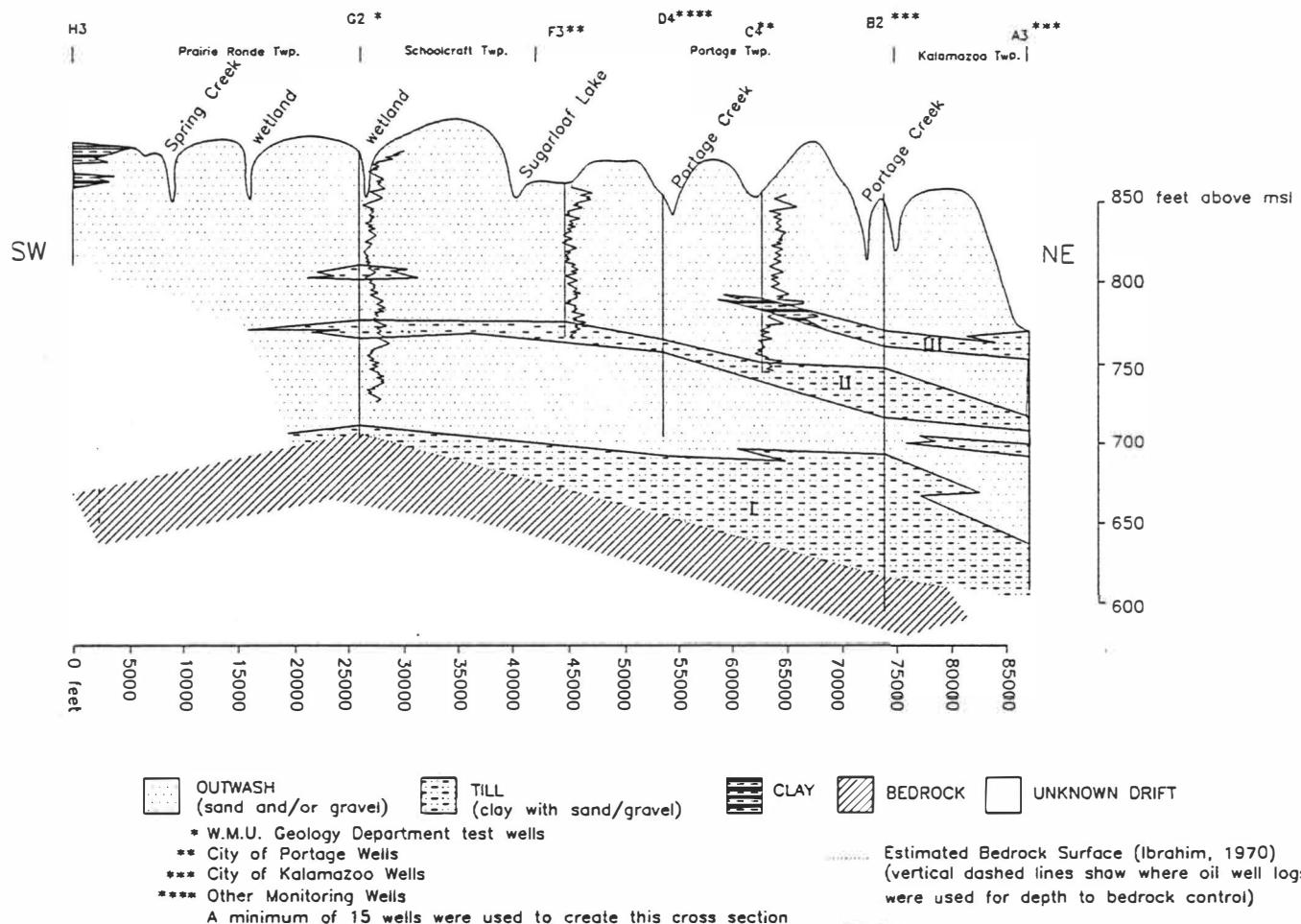


Figure 18. Cross Section J-J'.

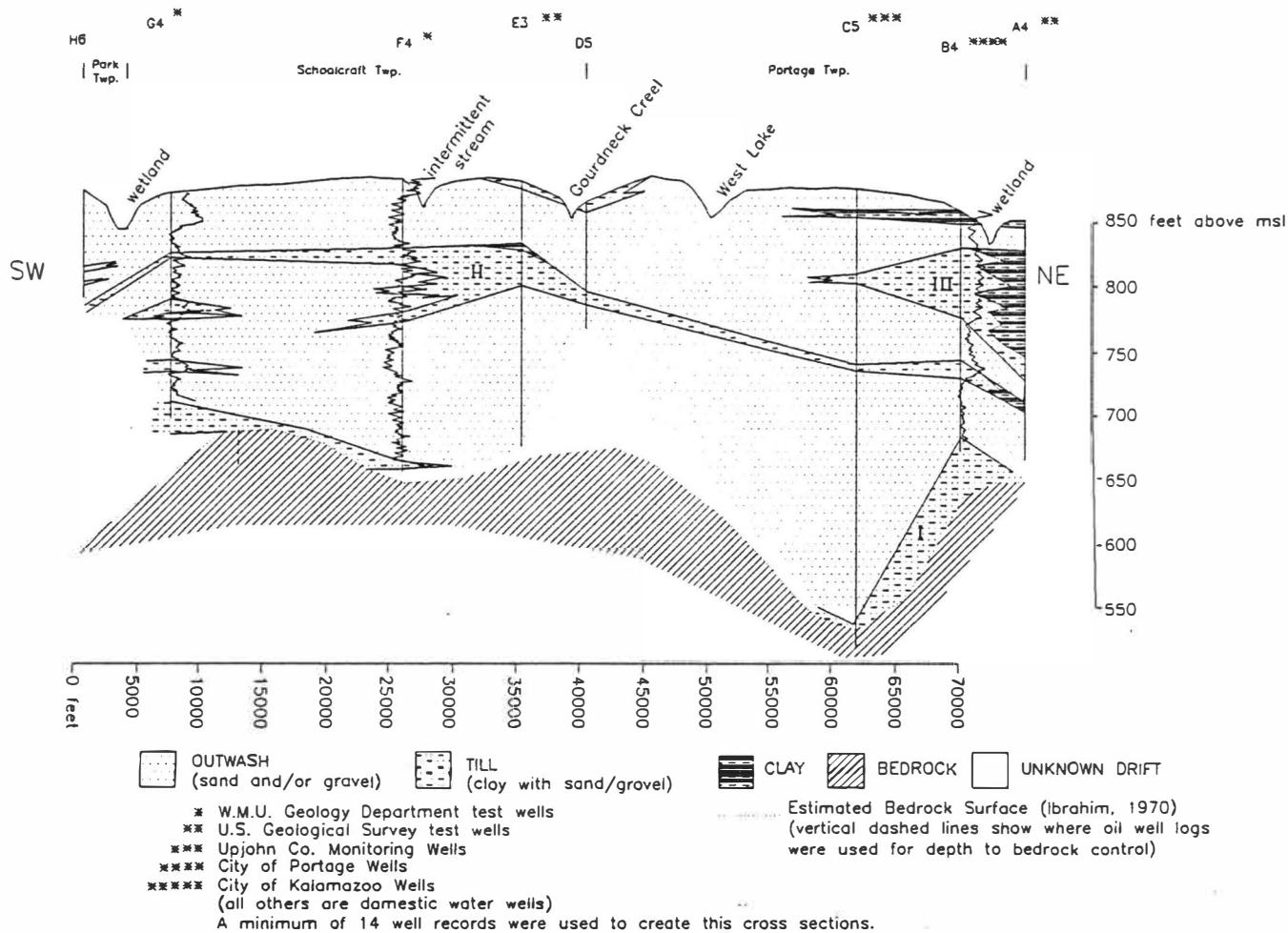


Figure 19. Cross Section K-K'.

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

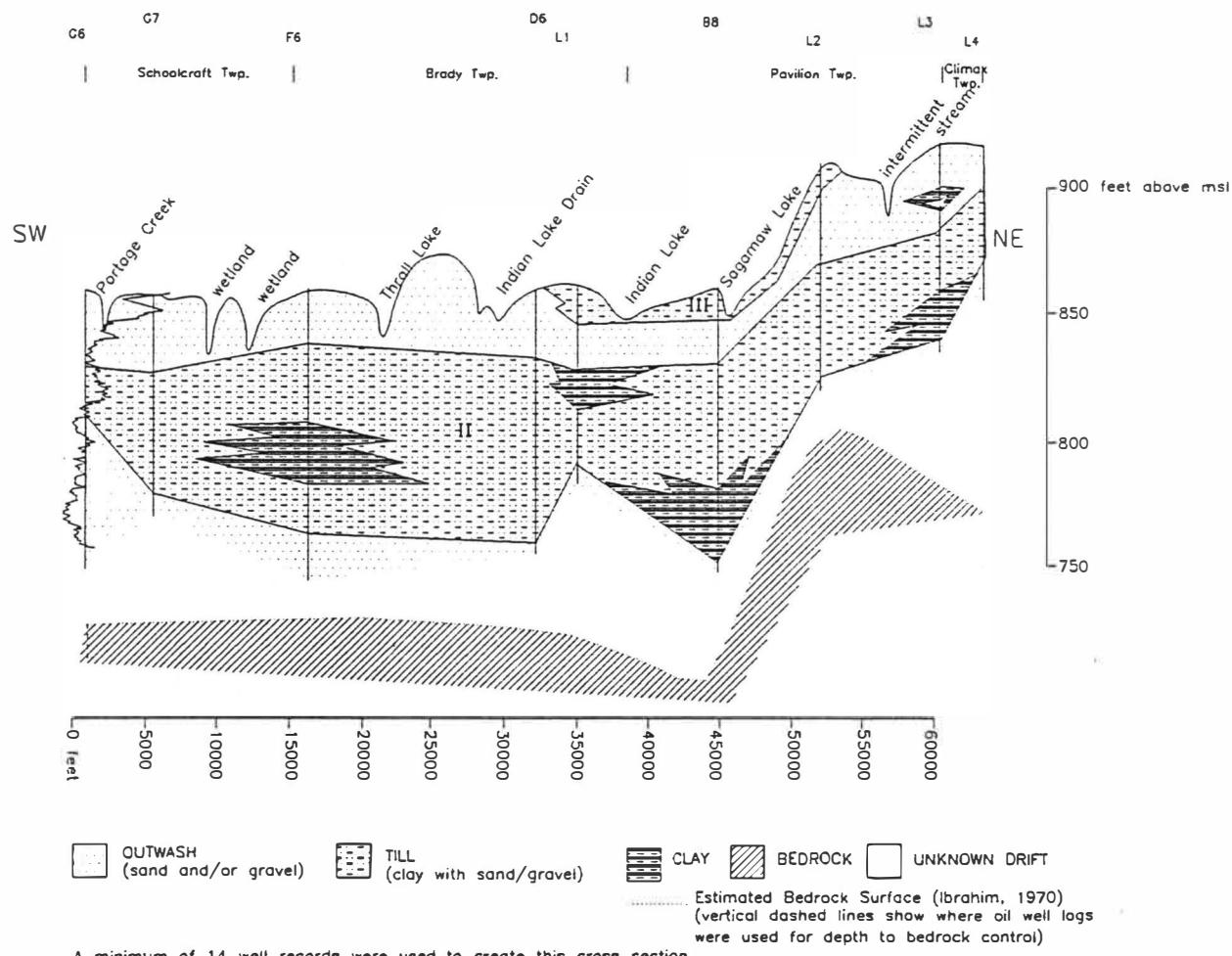


Figure 20. Cross Section L-L'.

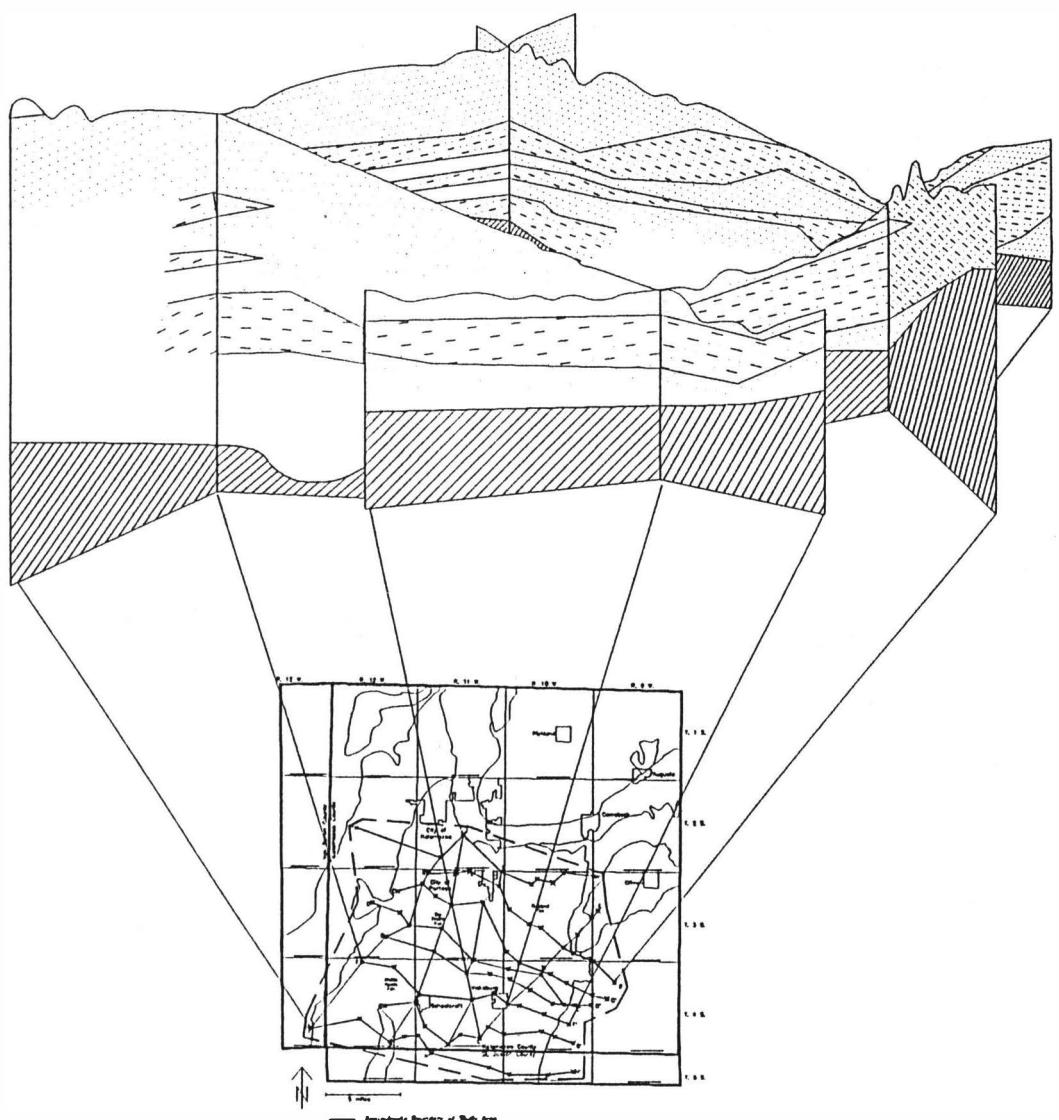


Figure 21. Fence Diagram.

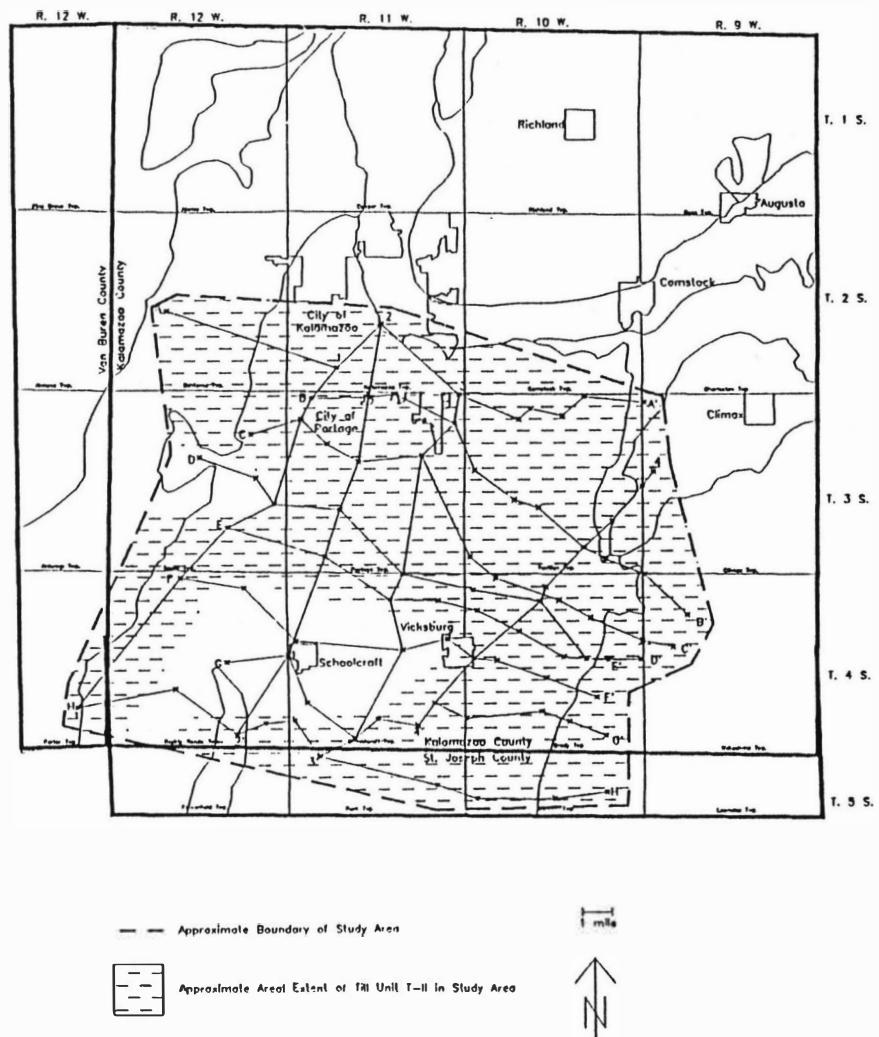


Figure 22. Map of Areal Extent of Till Unit II.

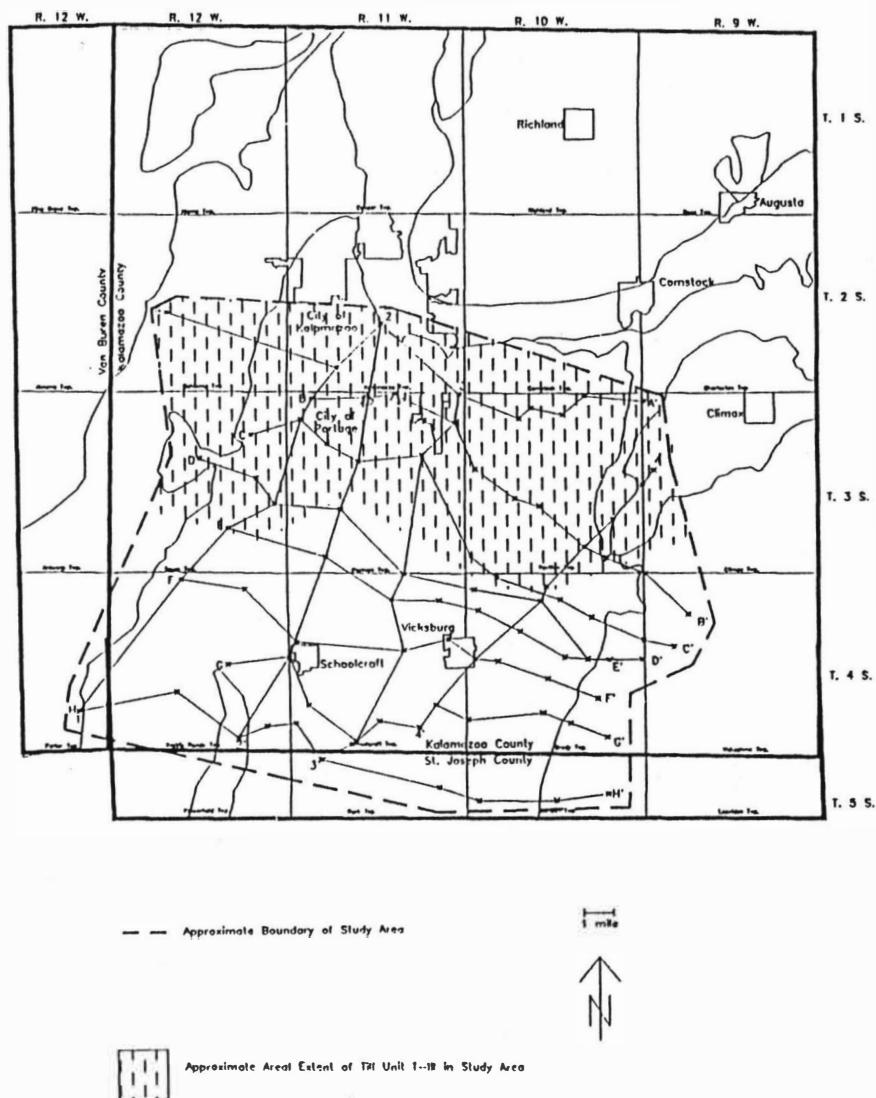


Figure 23. Map of Areal Extent of Till Unit III.

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

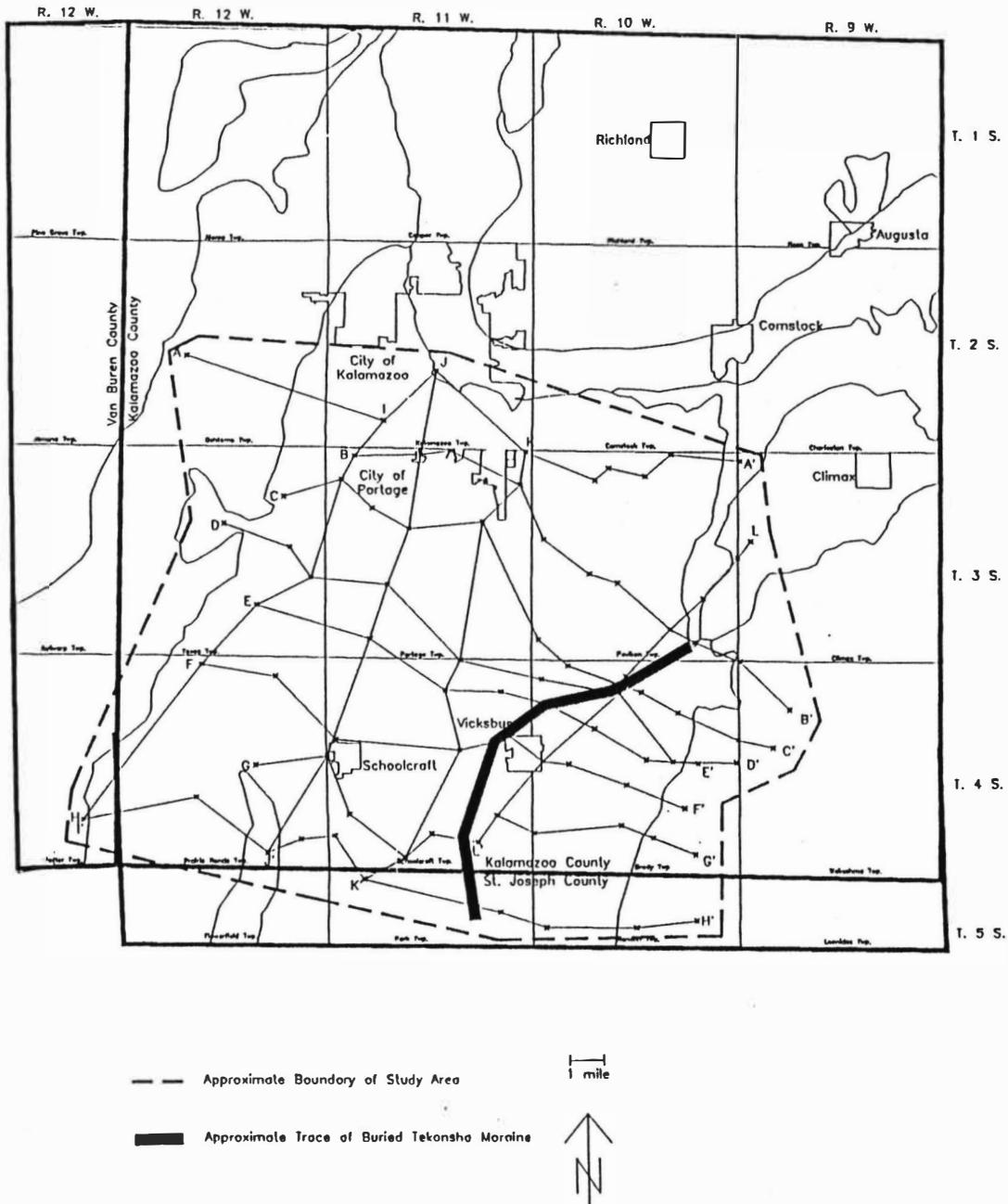


Figure 24. Trace of Buried Arm of the Tekonsha Moraine.

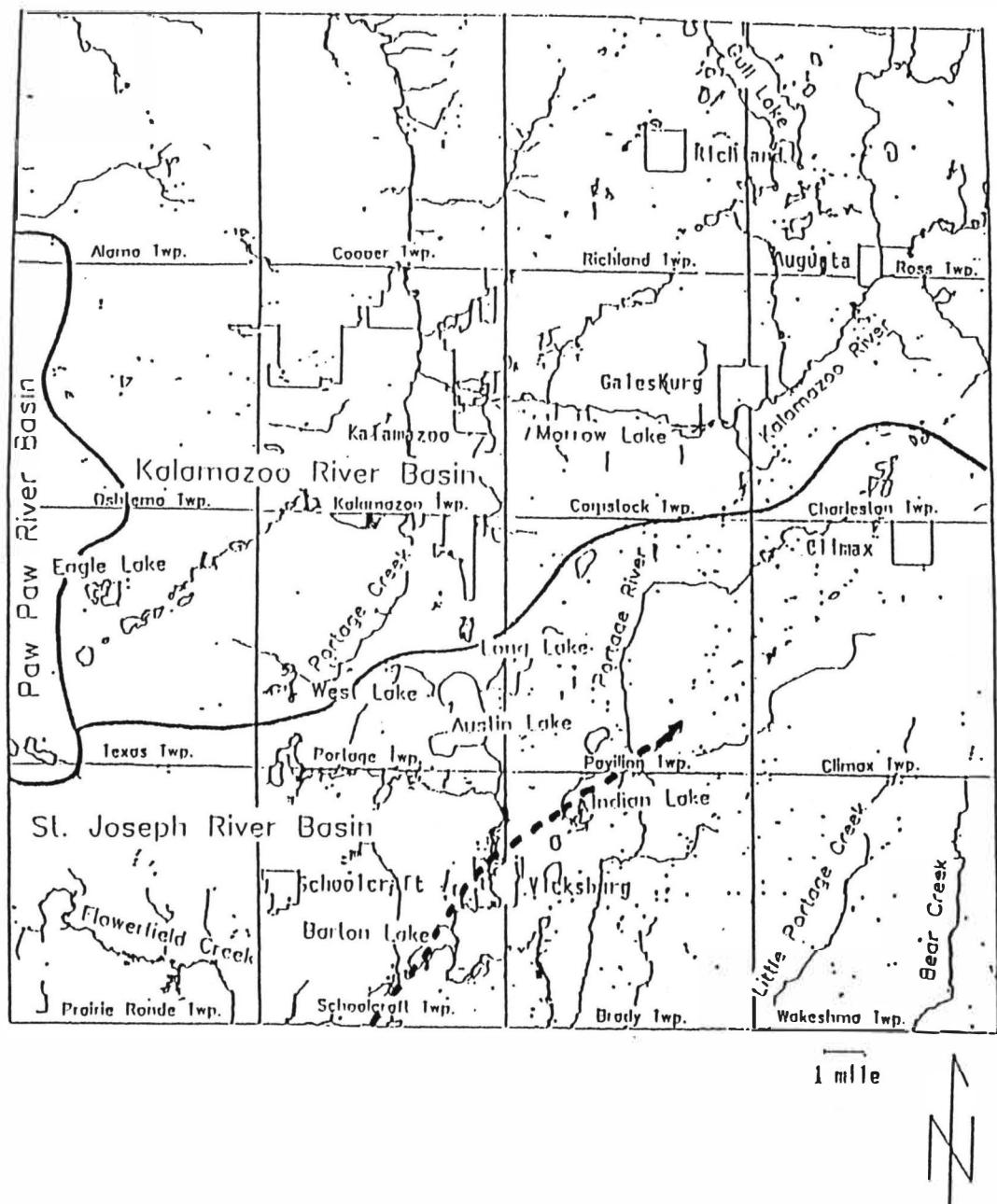


Figure 25. Trace of Buried Arm of the Tekonsha Moraine Superimposed on Map of Surface Water Bodies.

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.

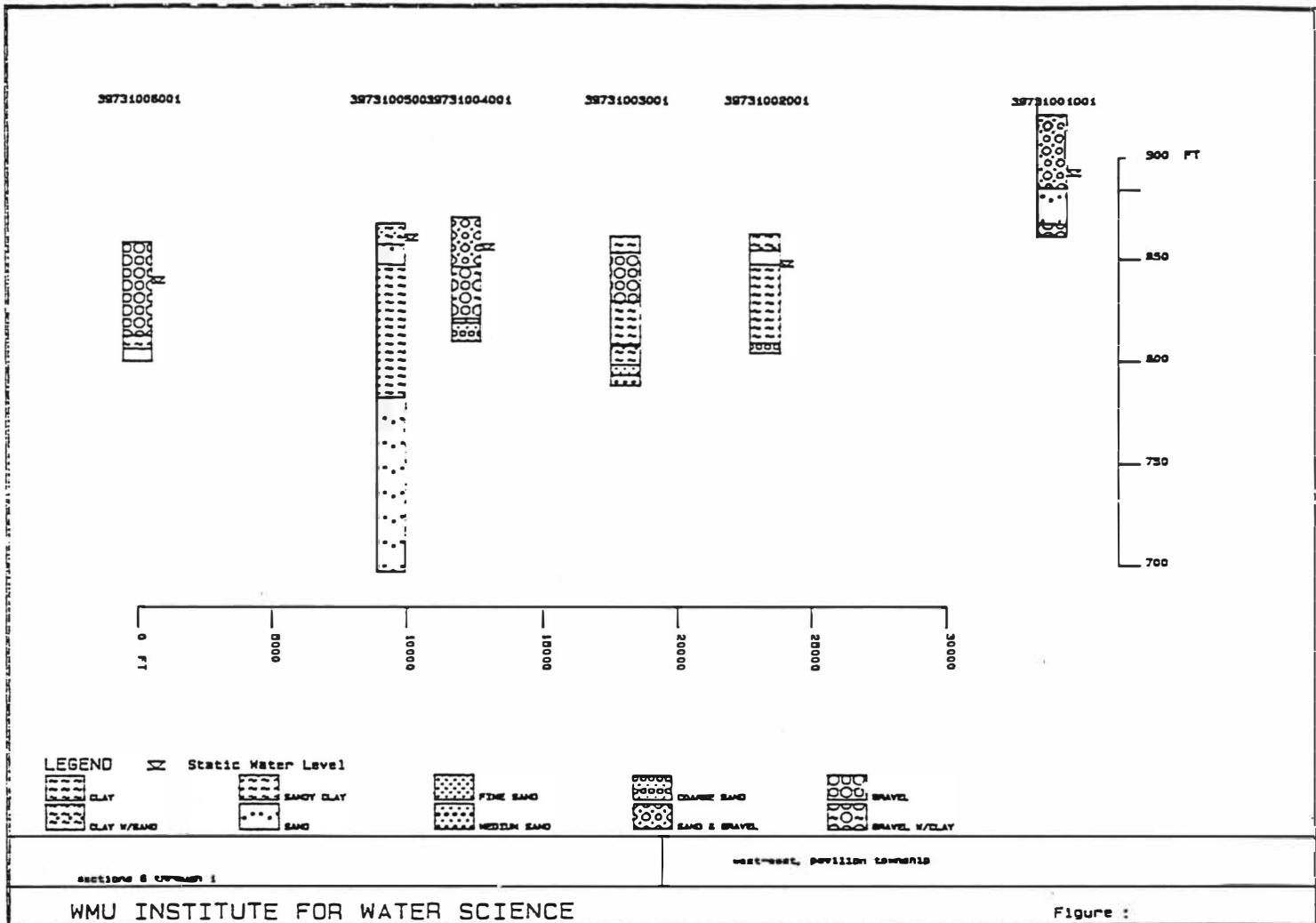
Very little evidence of till unit T-III remains in the southern portion of the study area. Cross section J-J' depicts a lens that appears to be correlatable to till unit T-III, and cross section I-I' suggests the continuation of this unit through the area. Again, rapid movement of the ice and subsequent 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.

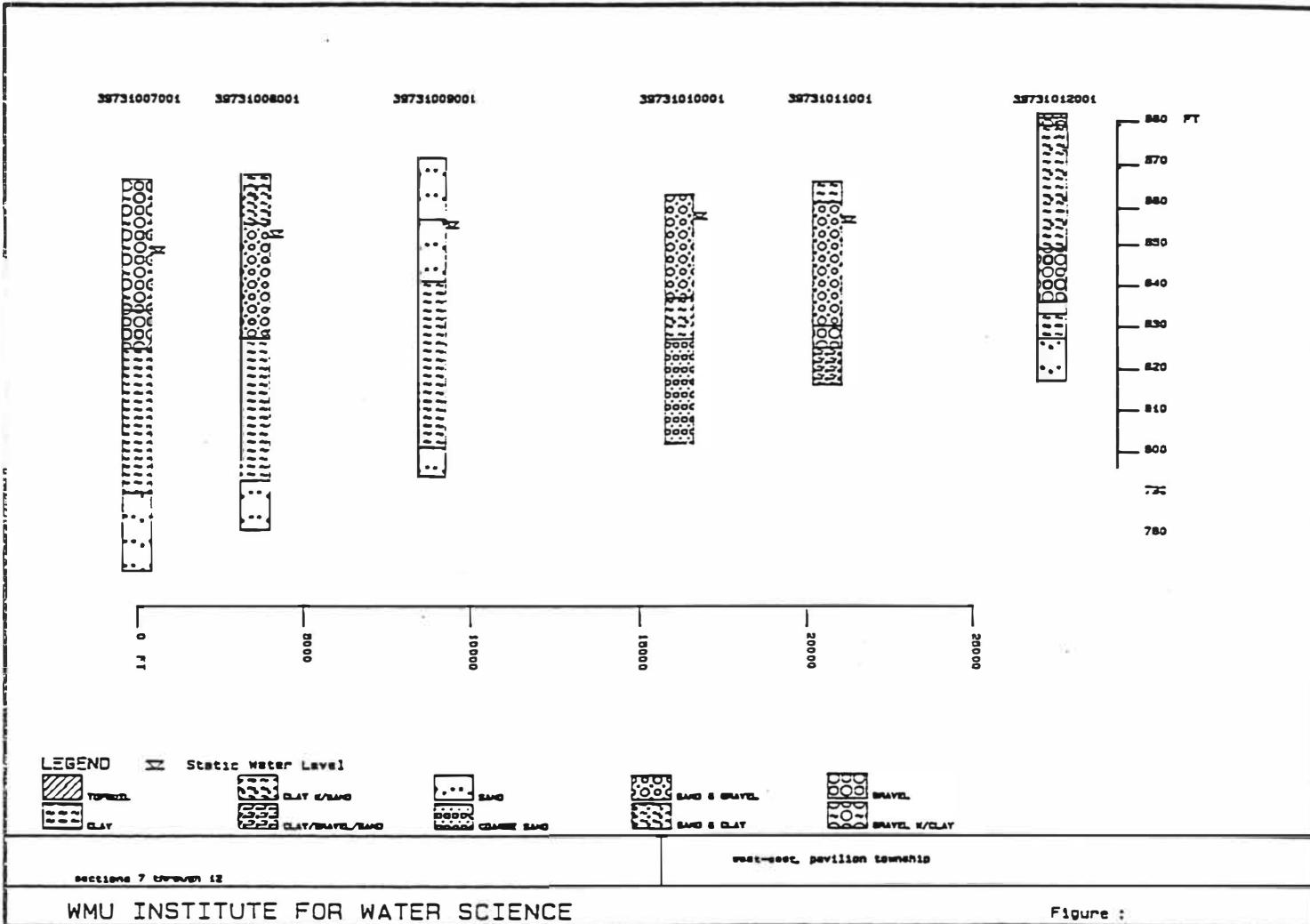
Cross sections D-D', E-E', and G-G' depict an upper till unit in the very eastern portion of the study area. This upper till unit represents a readvancement of the Saginaw Lobe after a retreat to at least the position of the west-east trending arm of the Tekonsha Moraine. This readvancement may be equivalent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

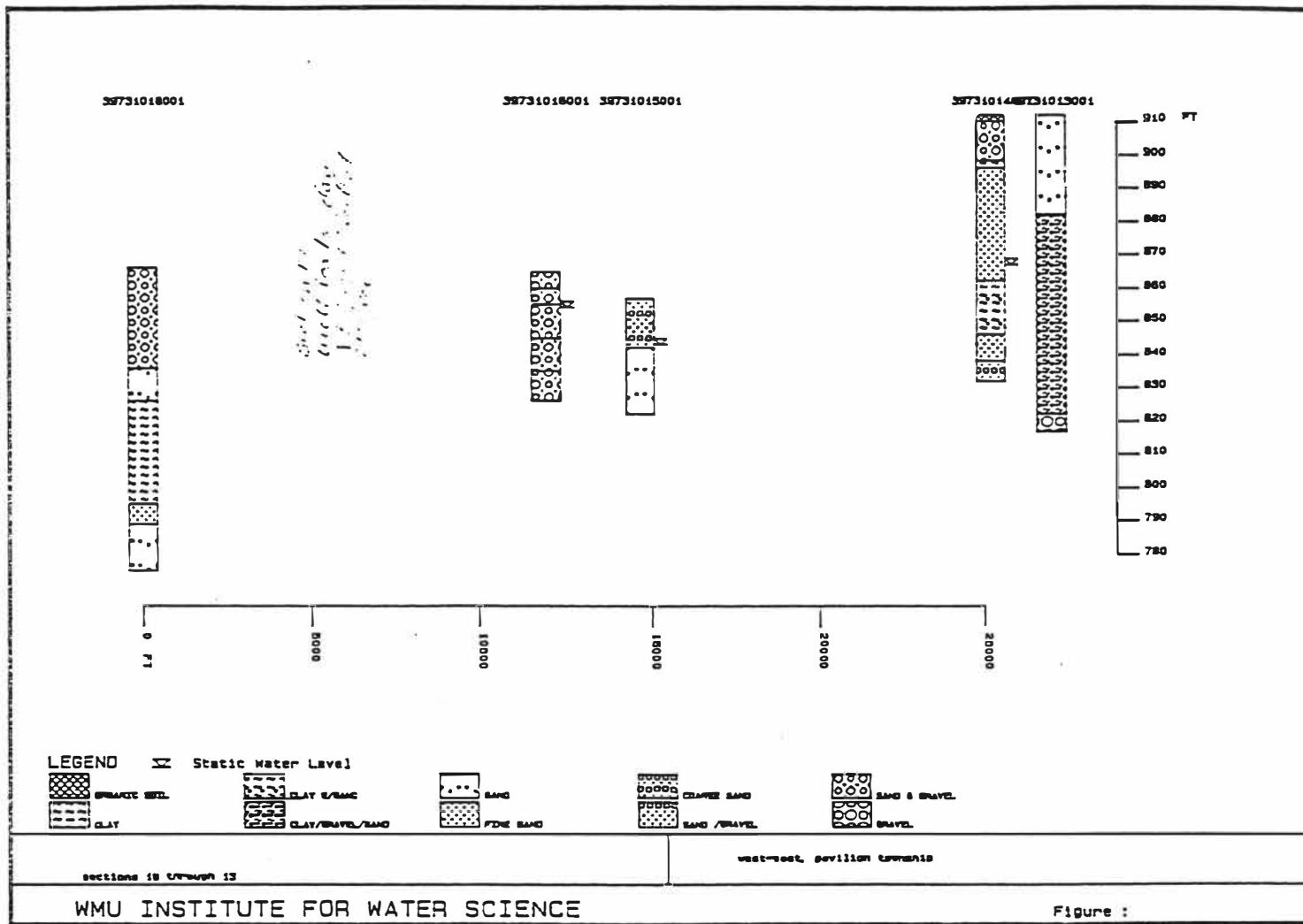
The surficial outwash complex at the surface of the study area is comprised of at least three glaciofluvial outwash fans (Straw, 1991). Two of these fans, located along the eastern margin of the Kalamazoo Moraine with axis trending generally northwest-southeast were deposited from meltwaters of the Lake 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.

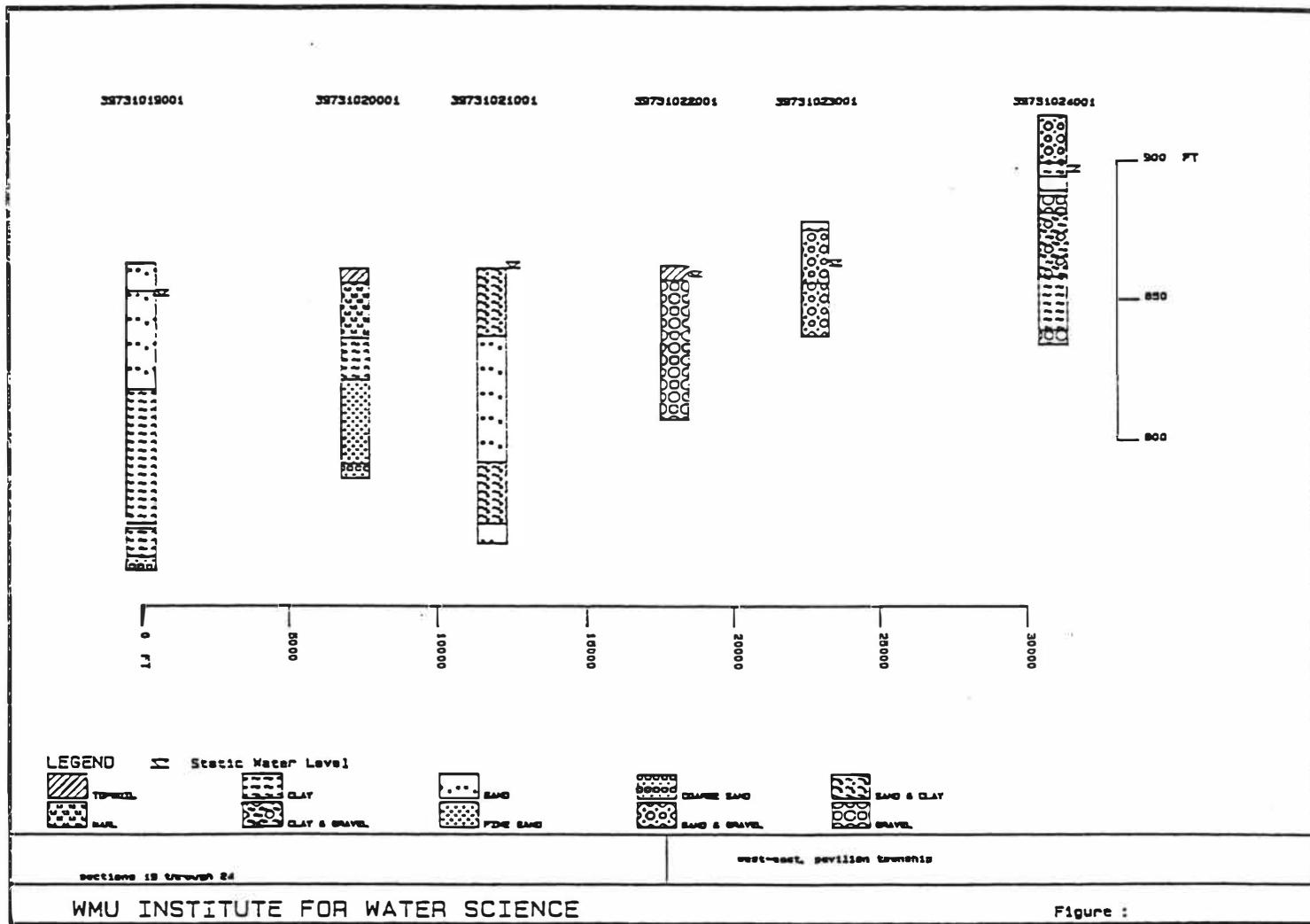
Appendix A

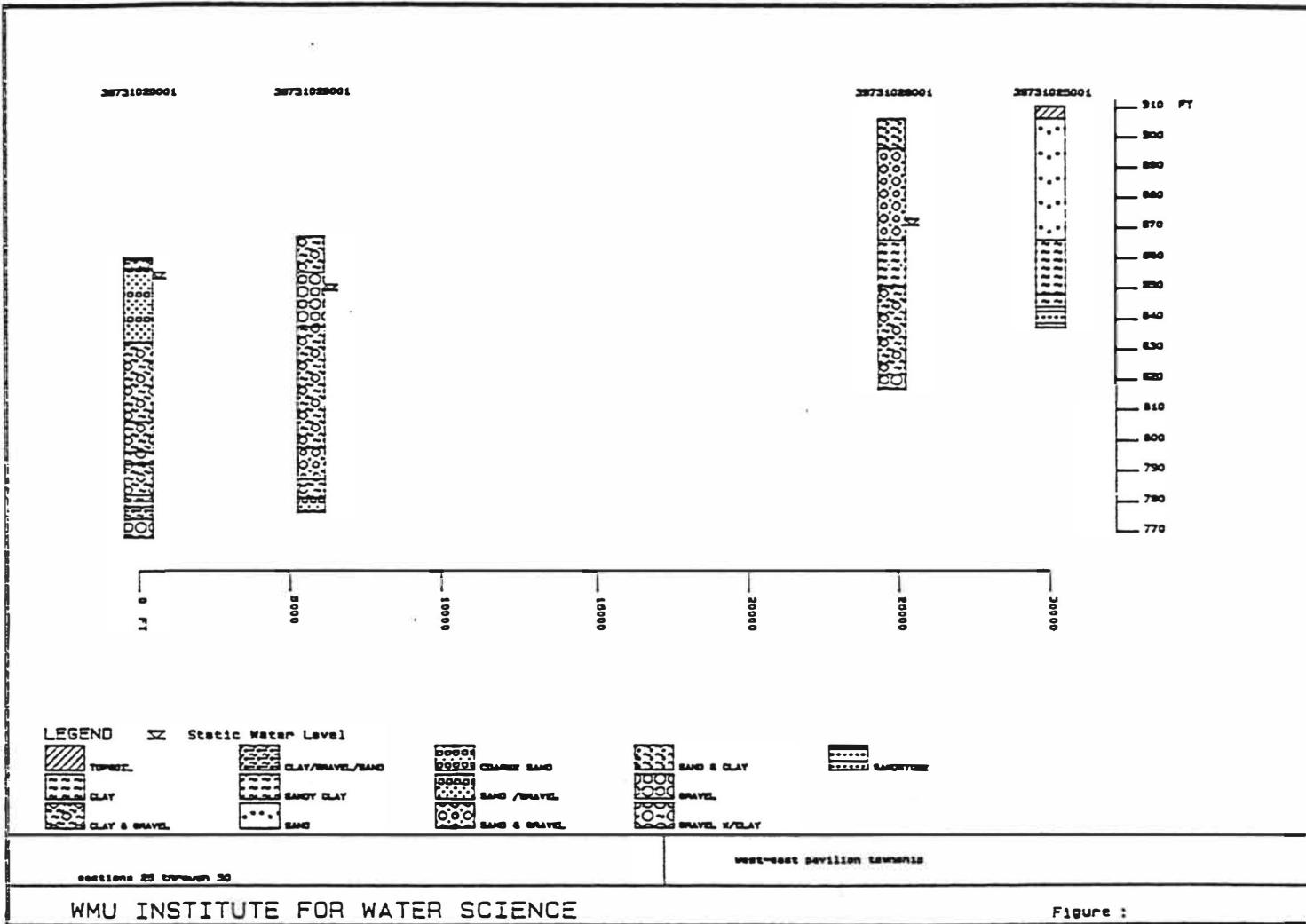
Short Cross Sections

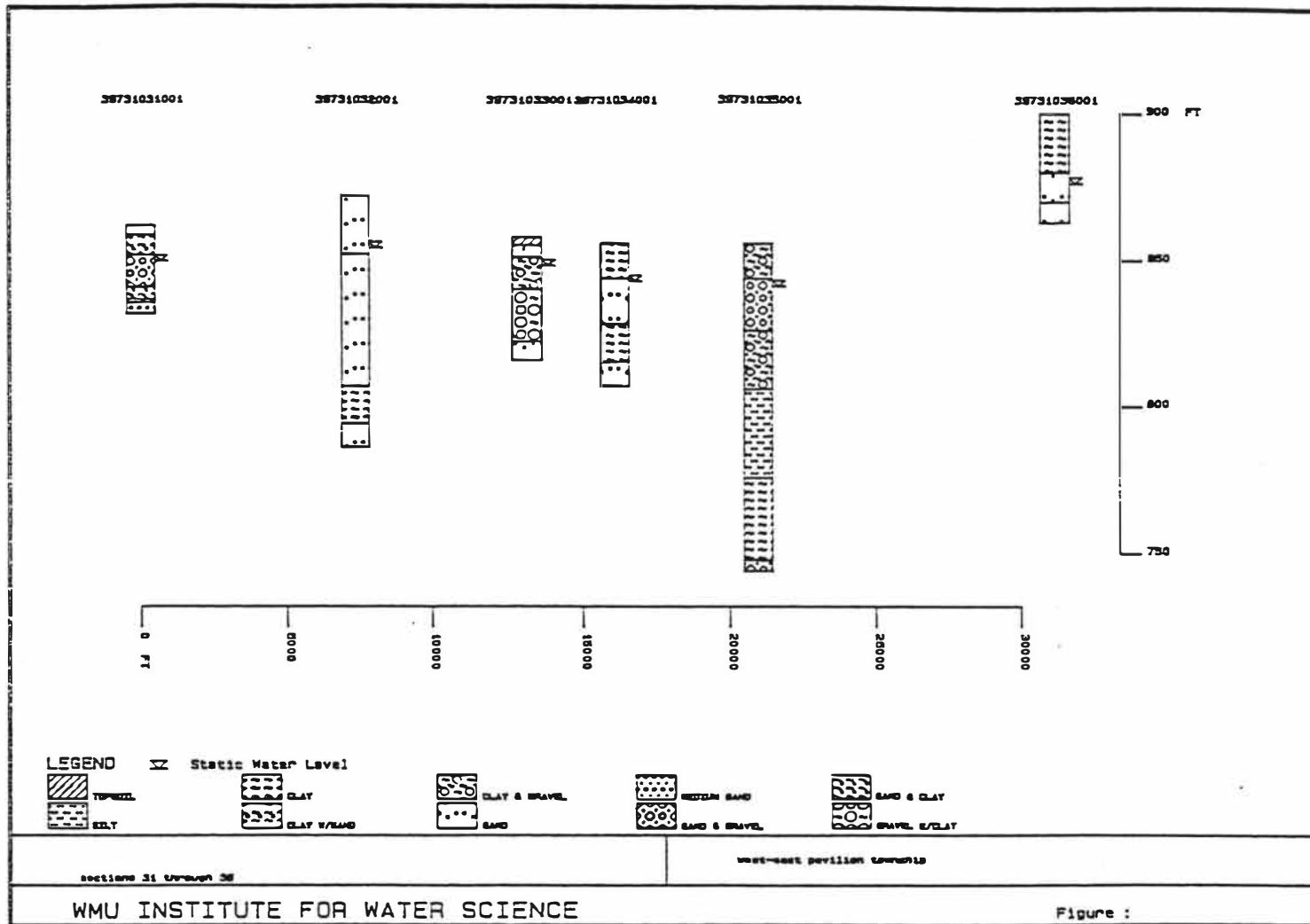


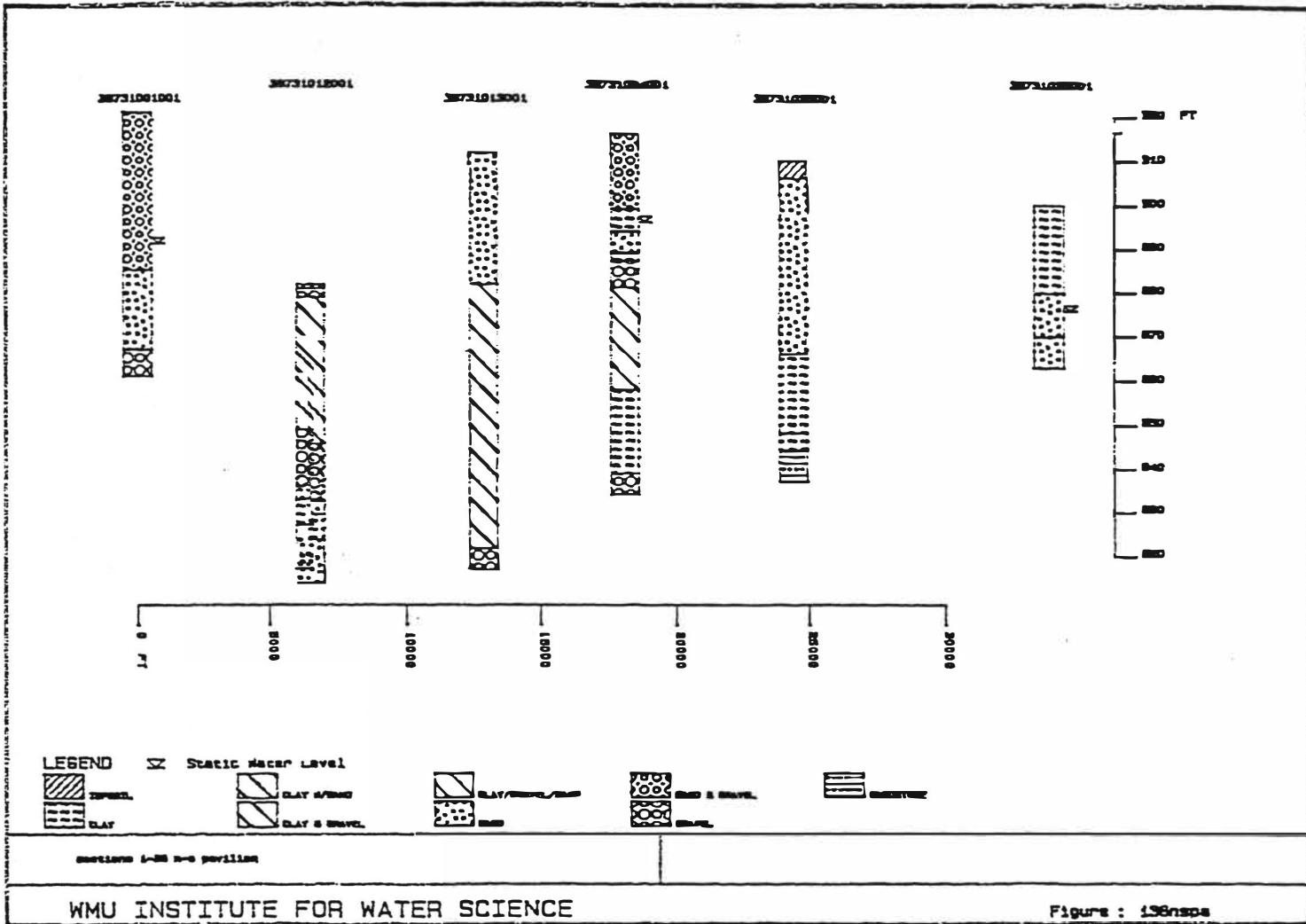


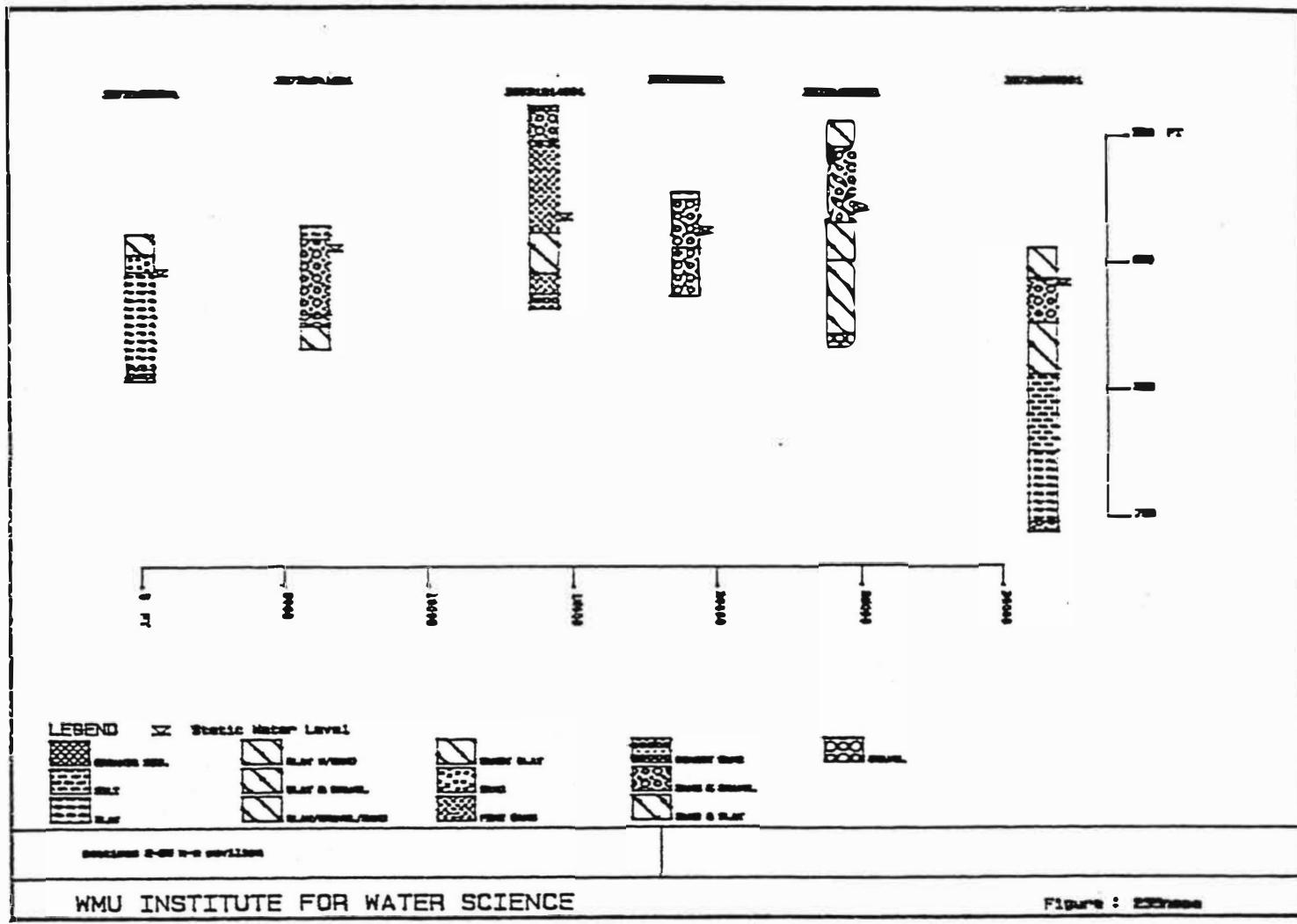


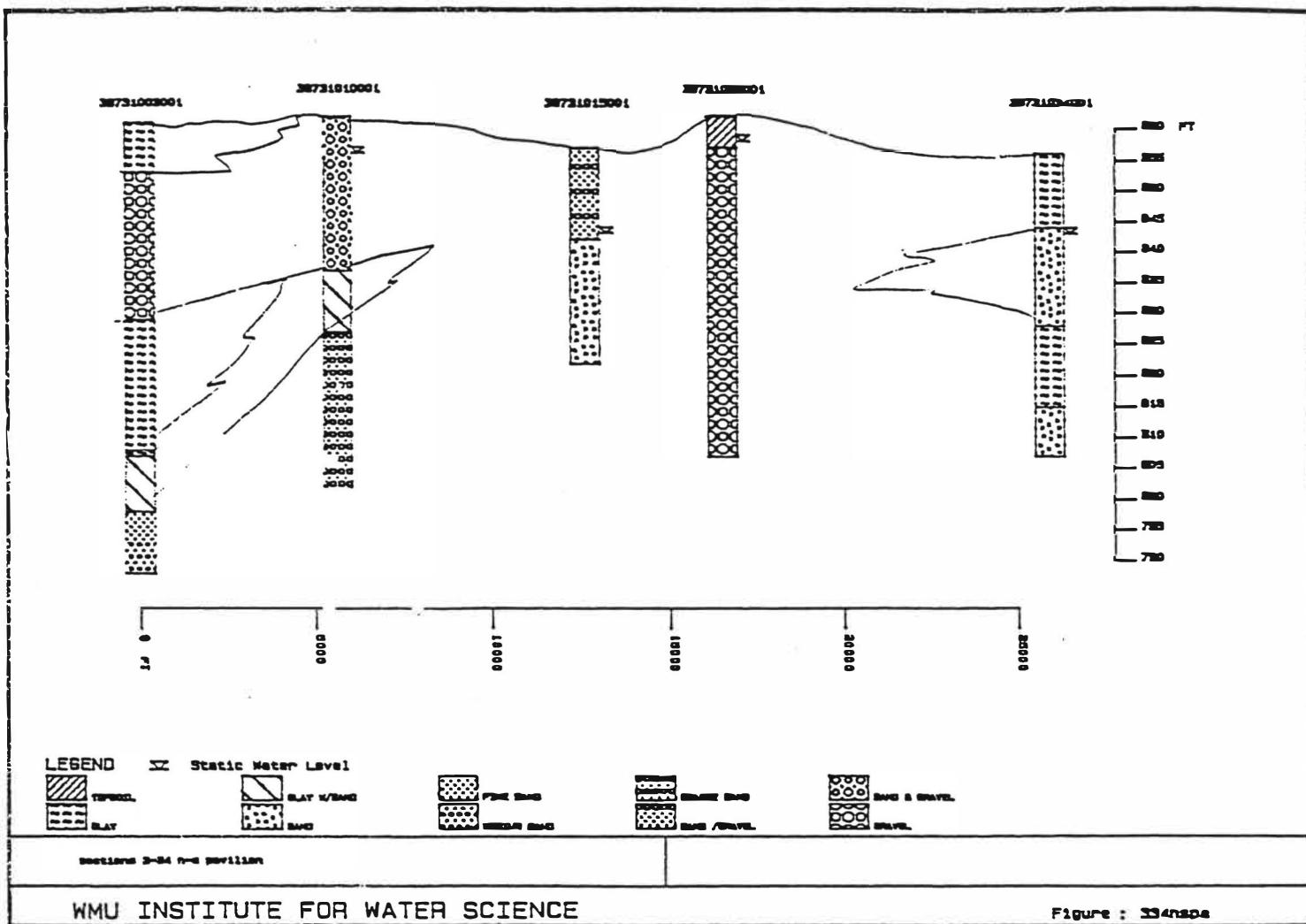


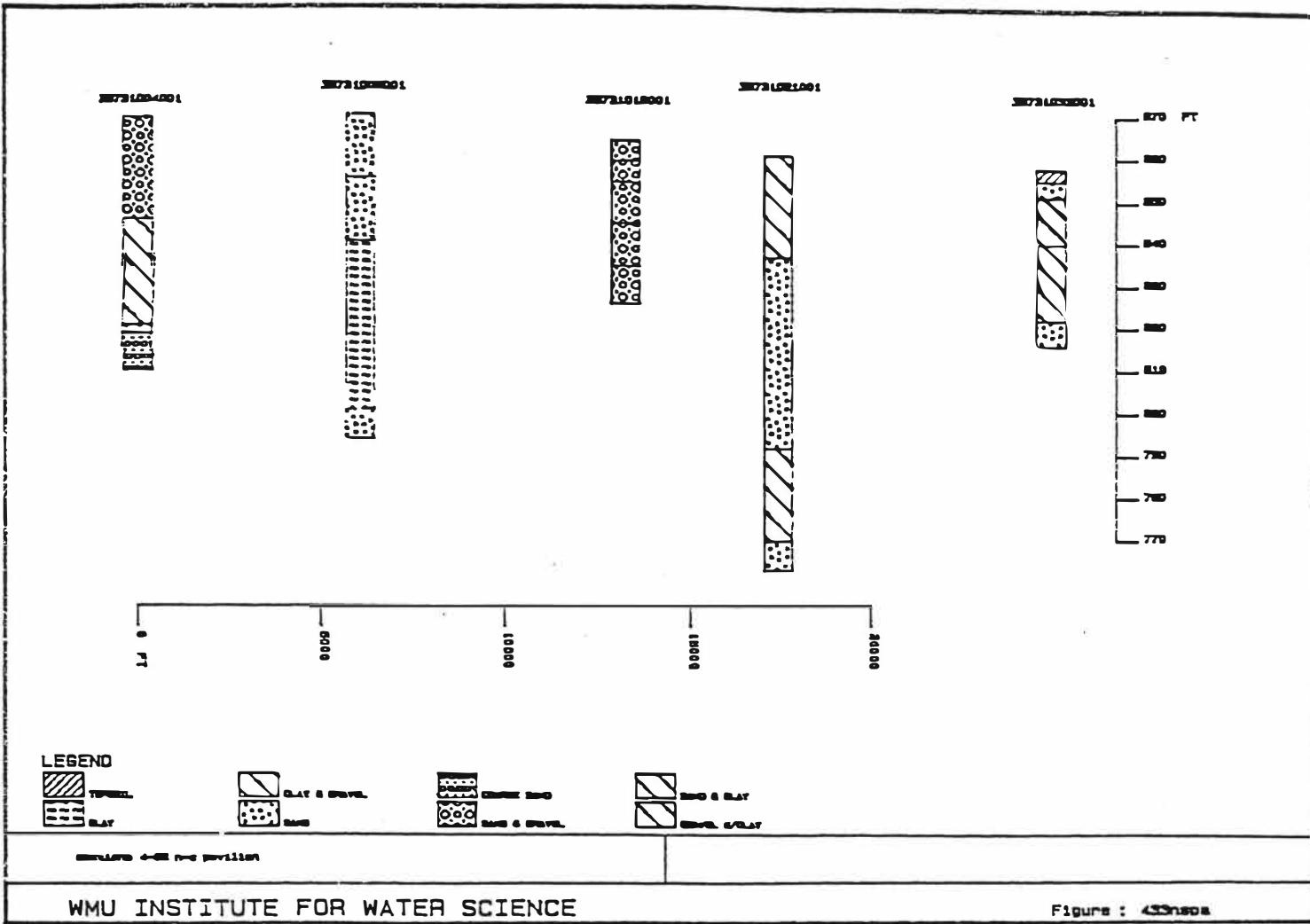


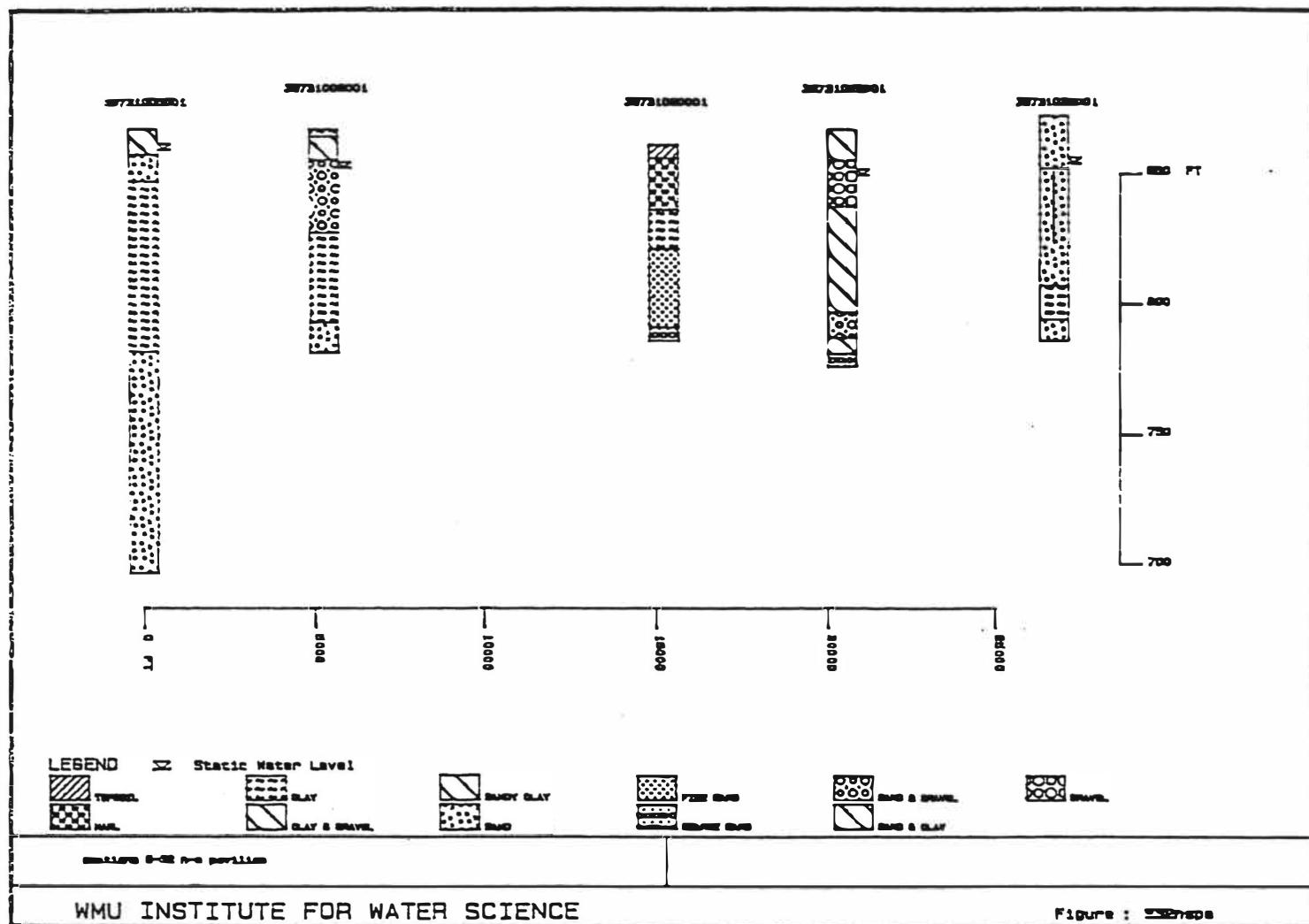


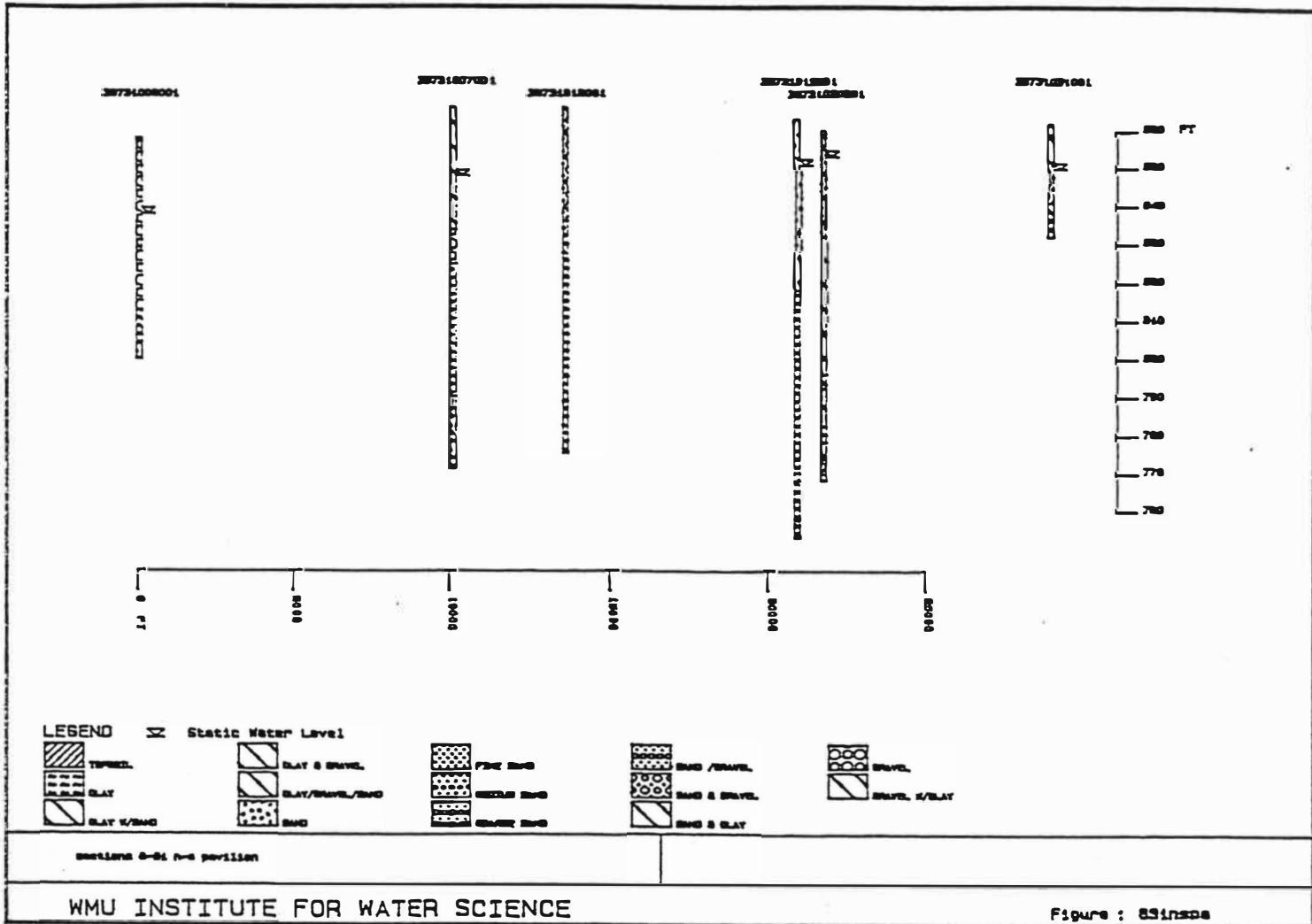


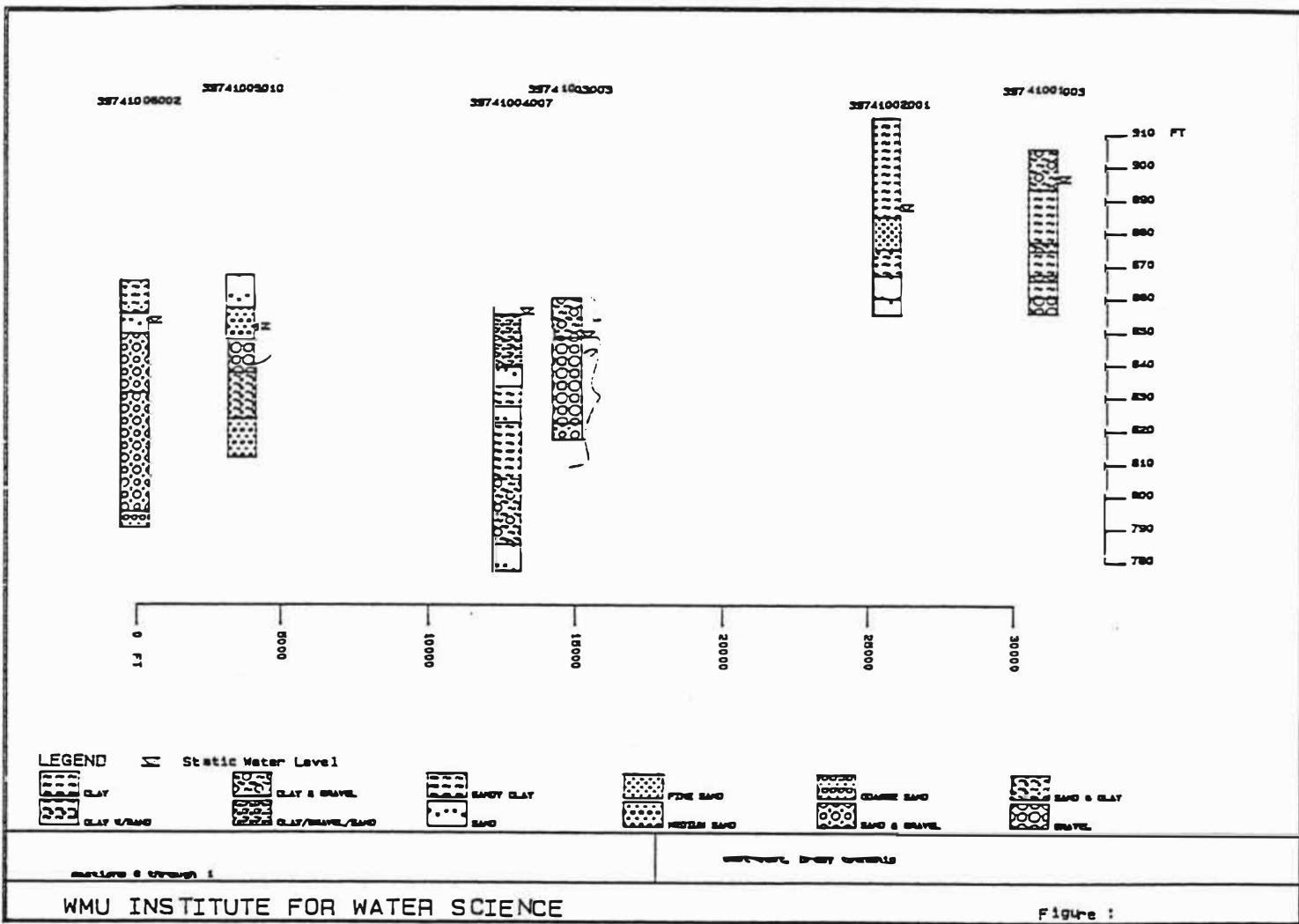


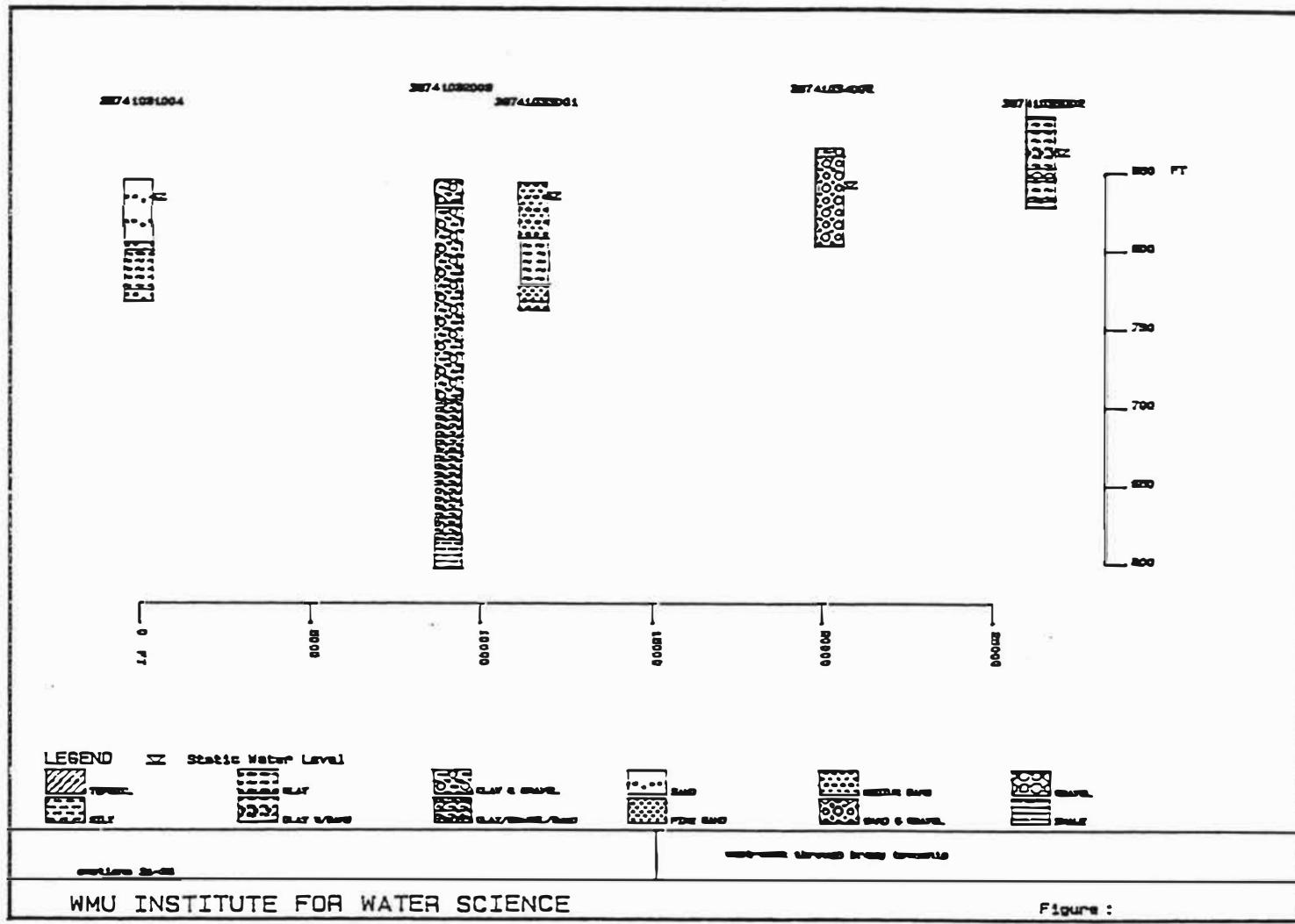


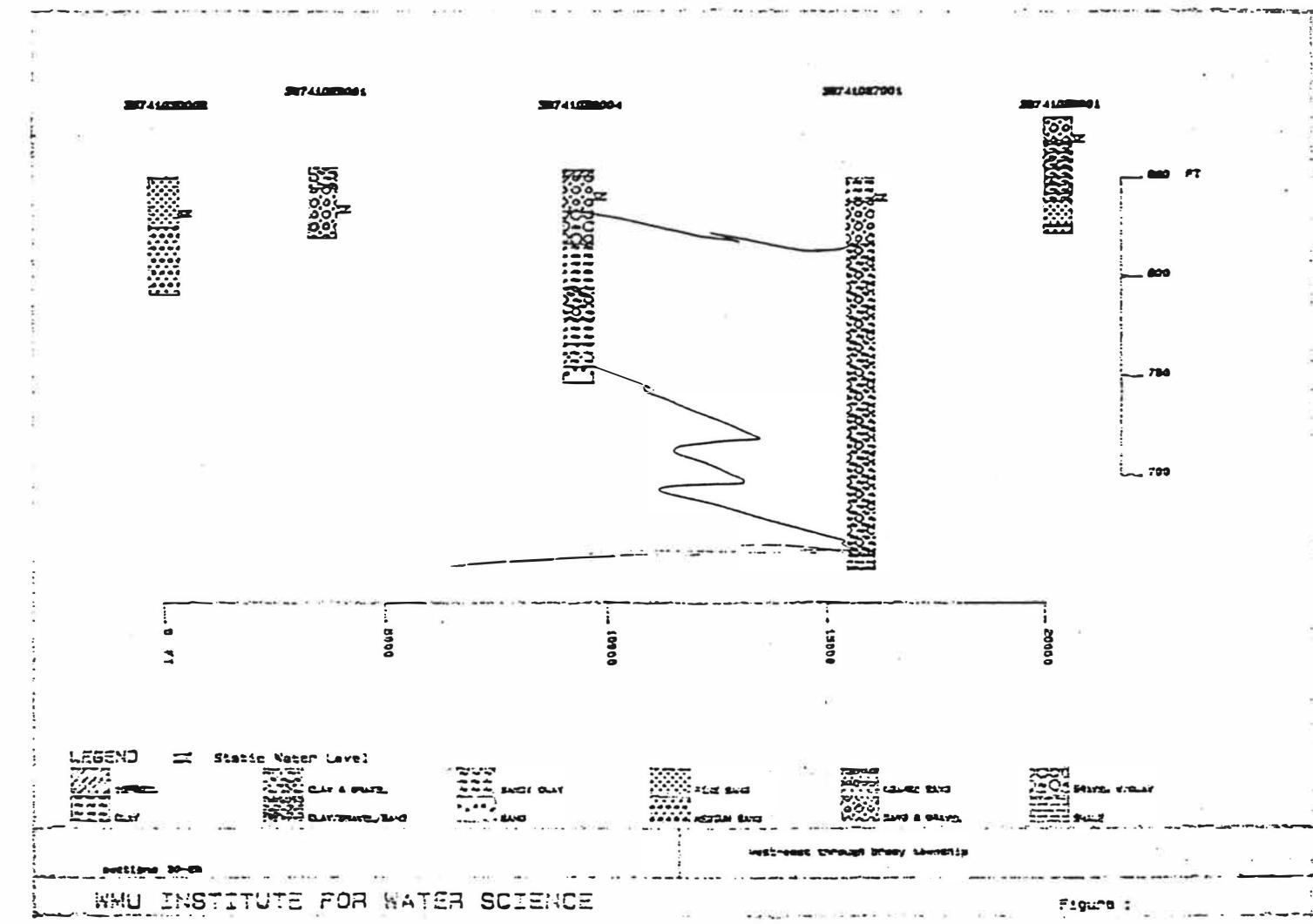






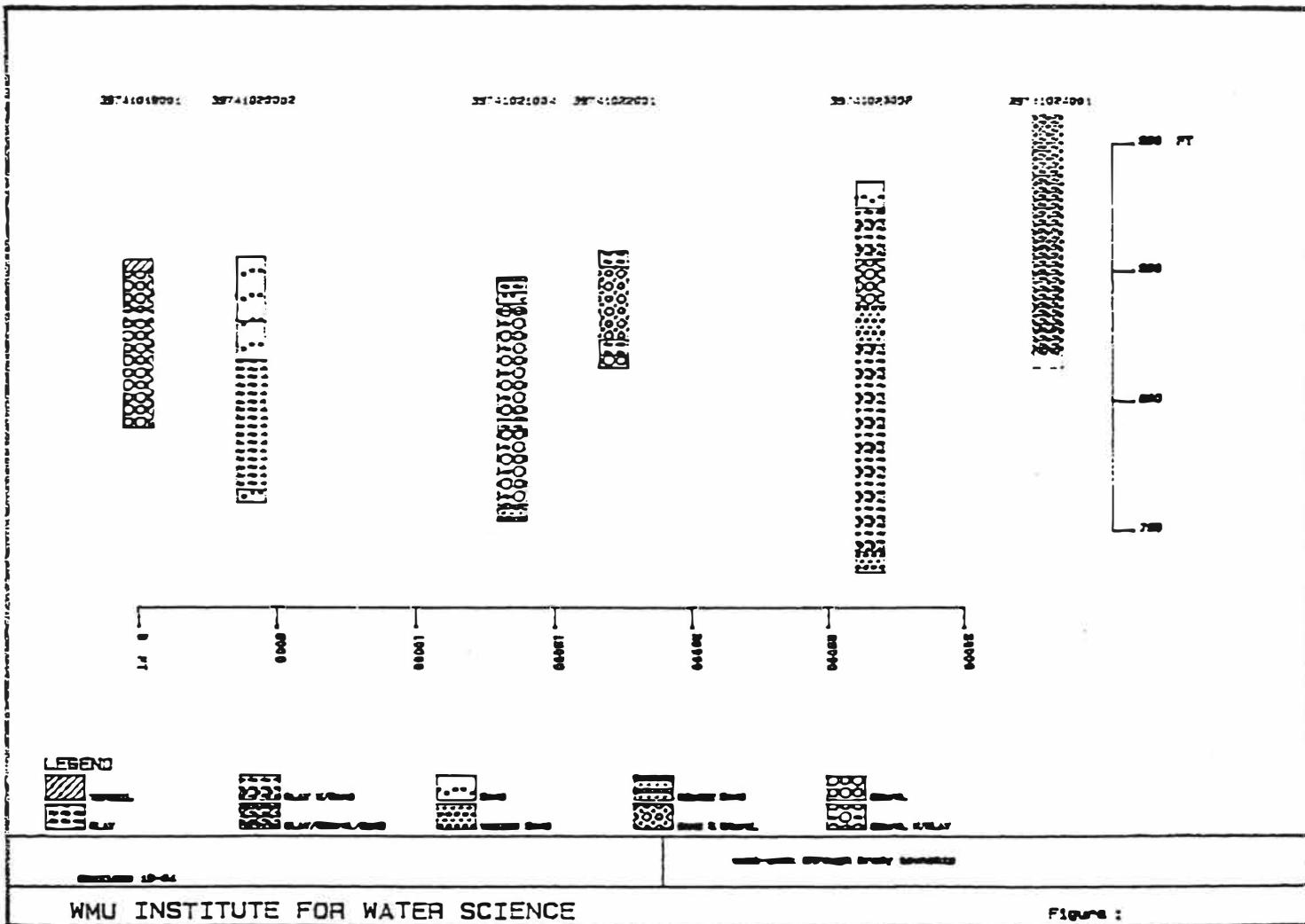


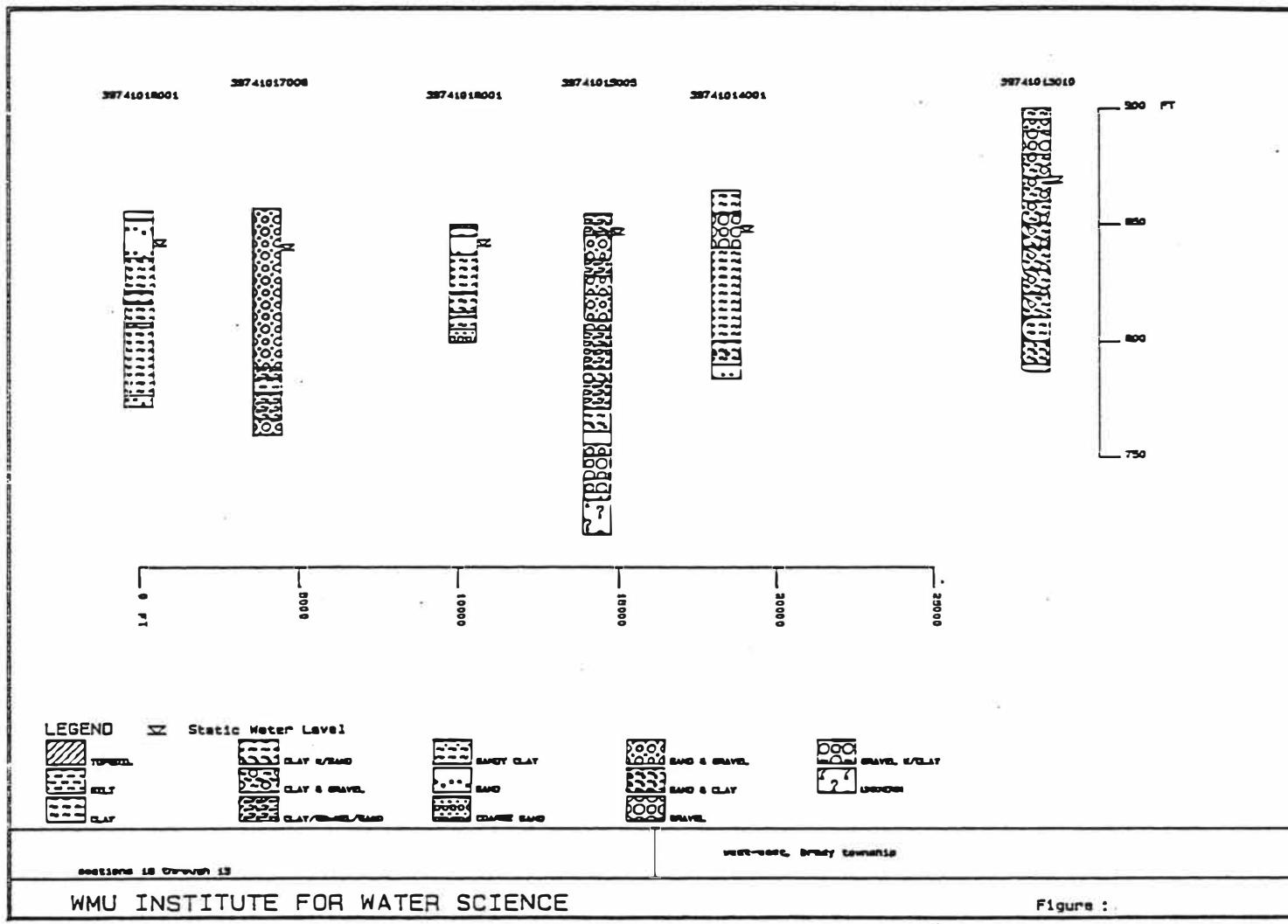


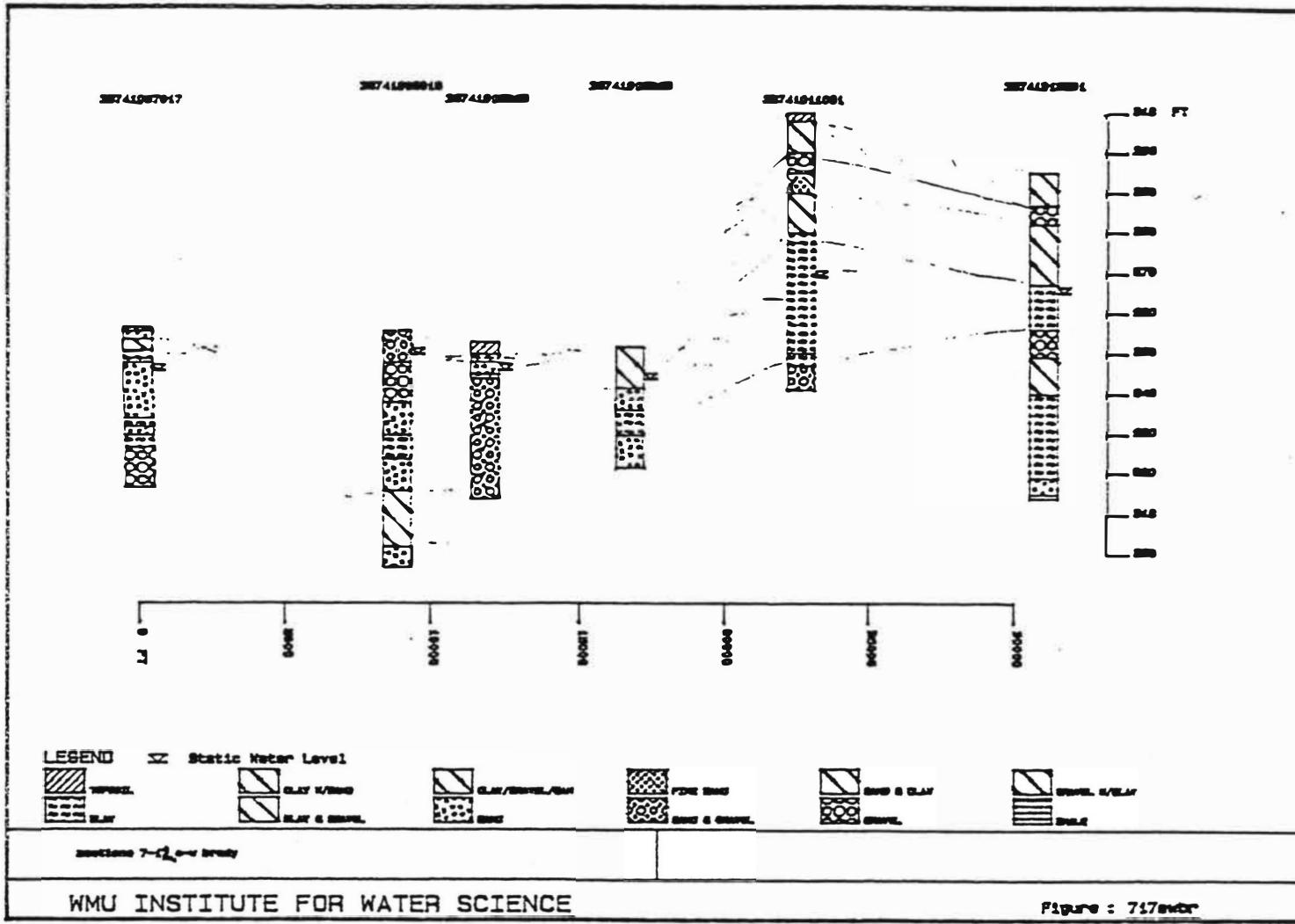


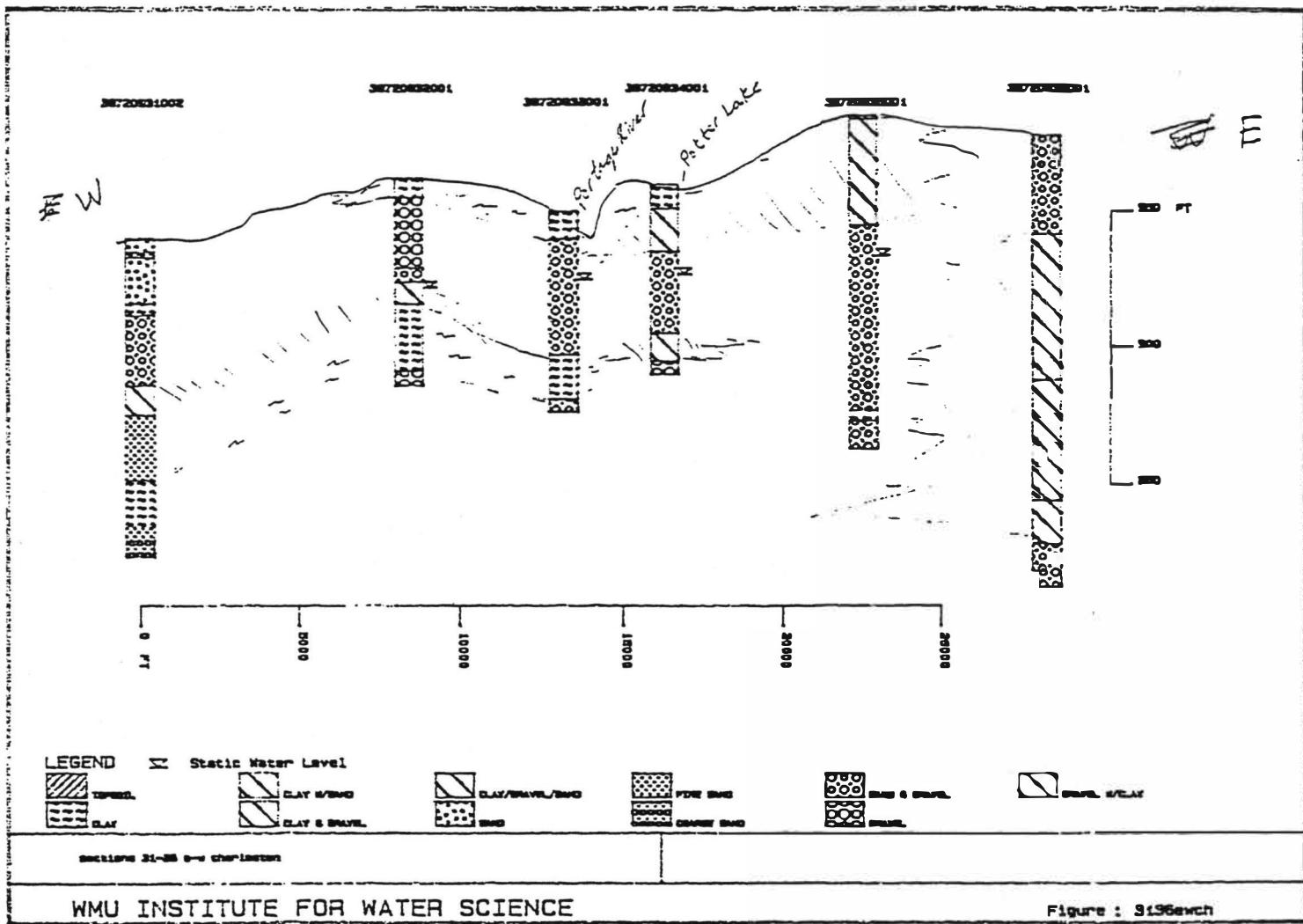
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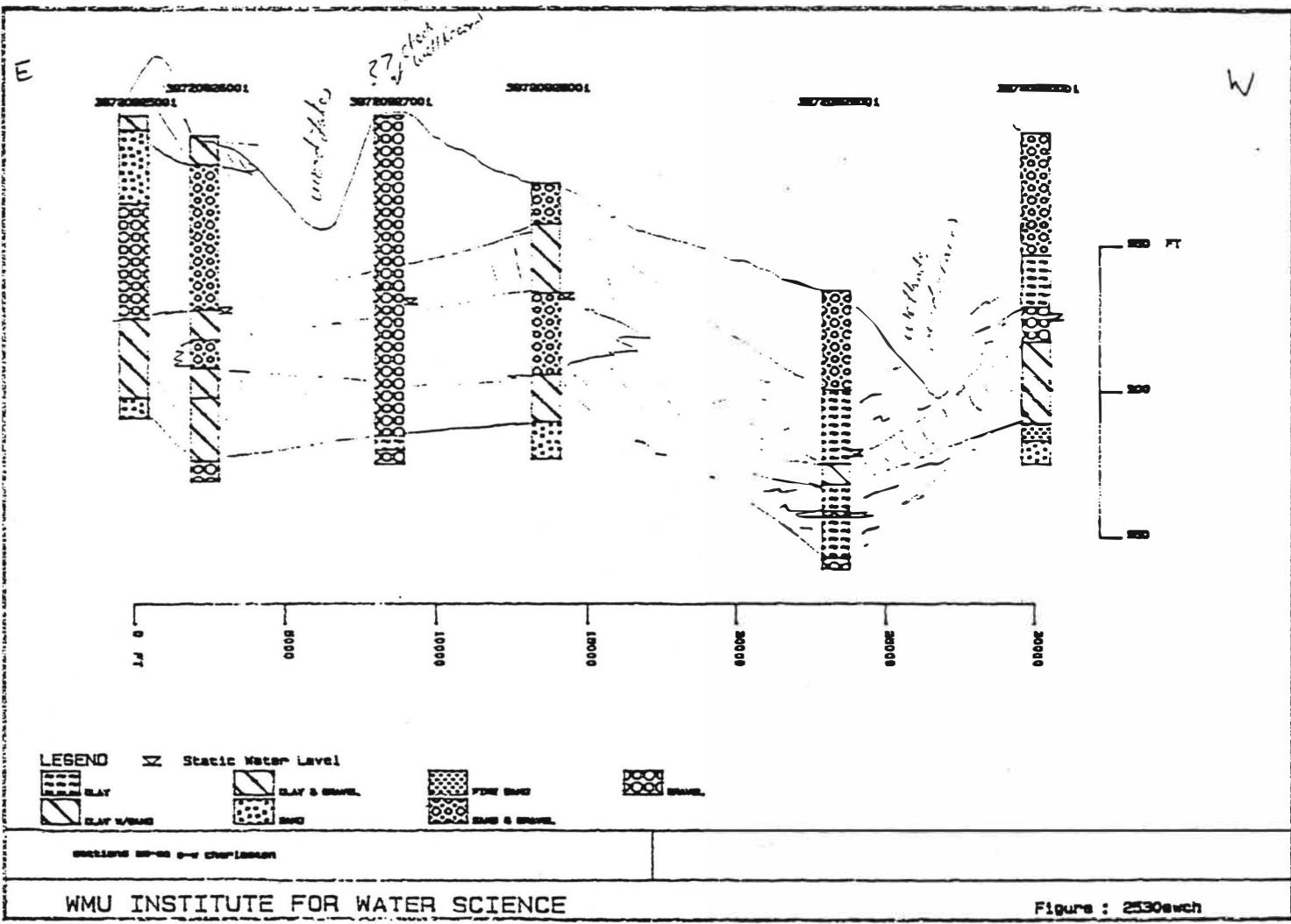
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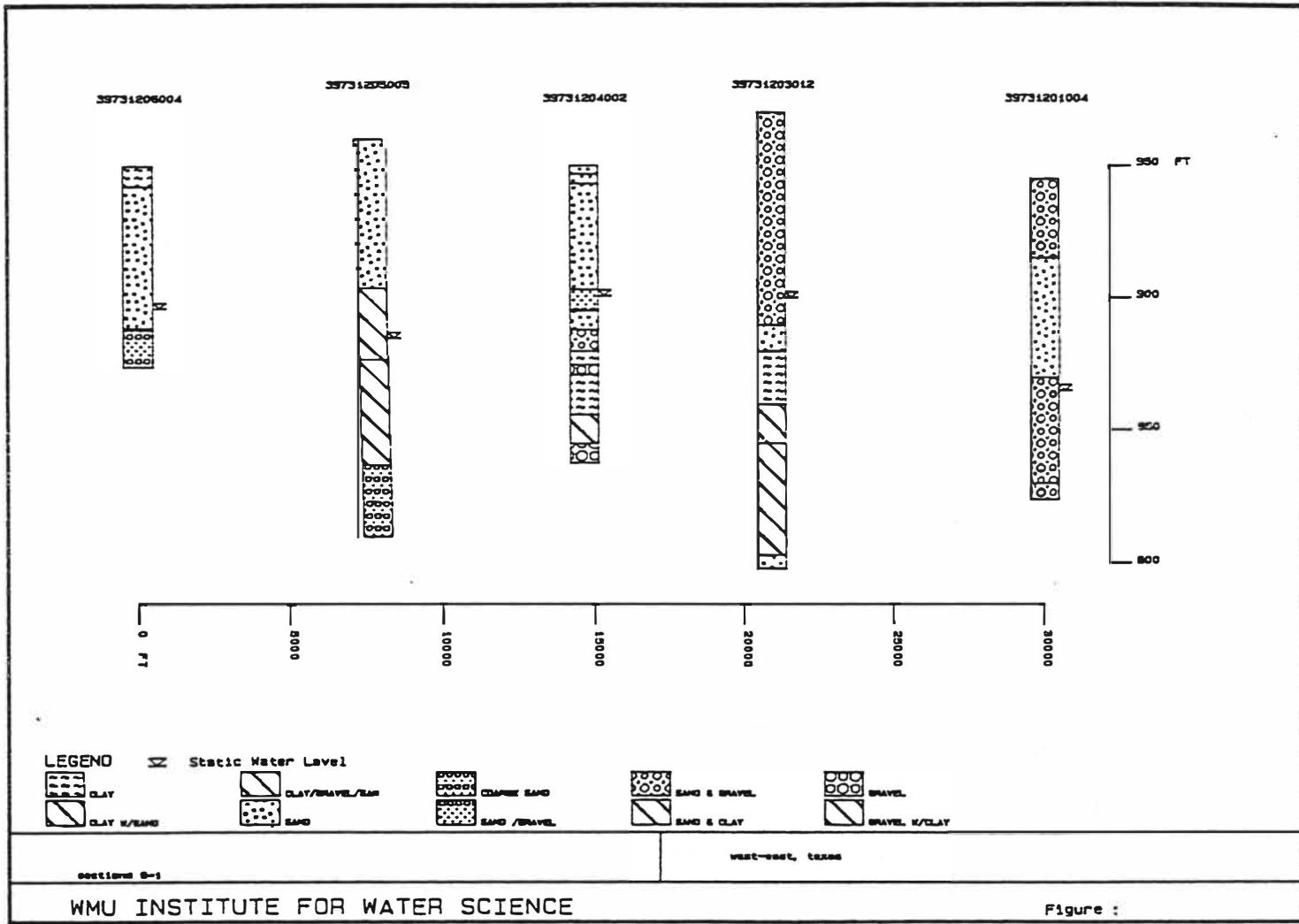


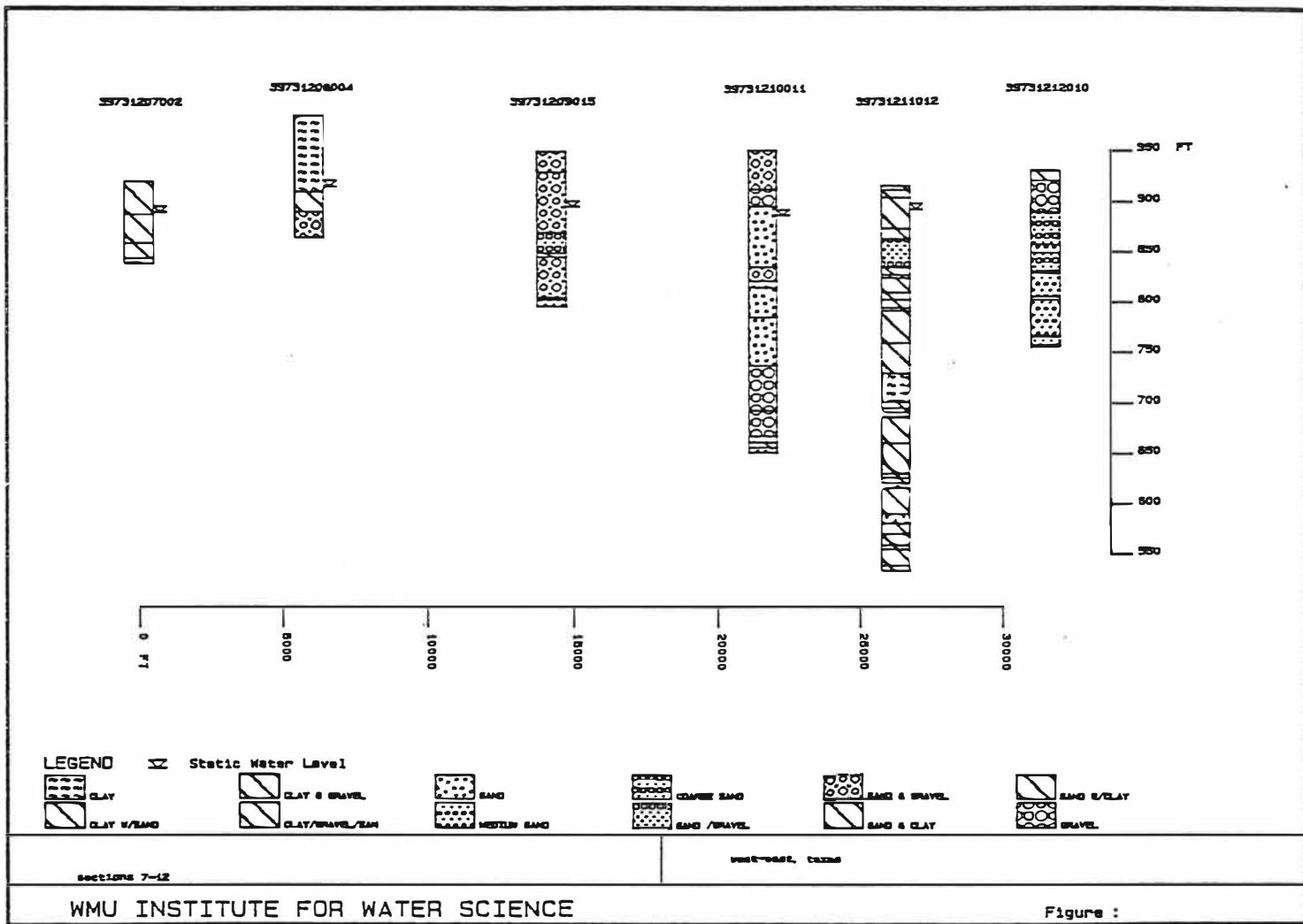


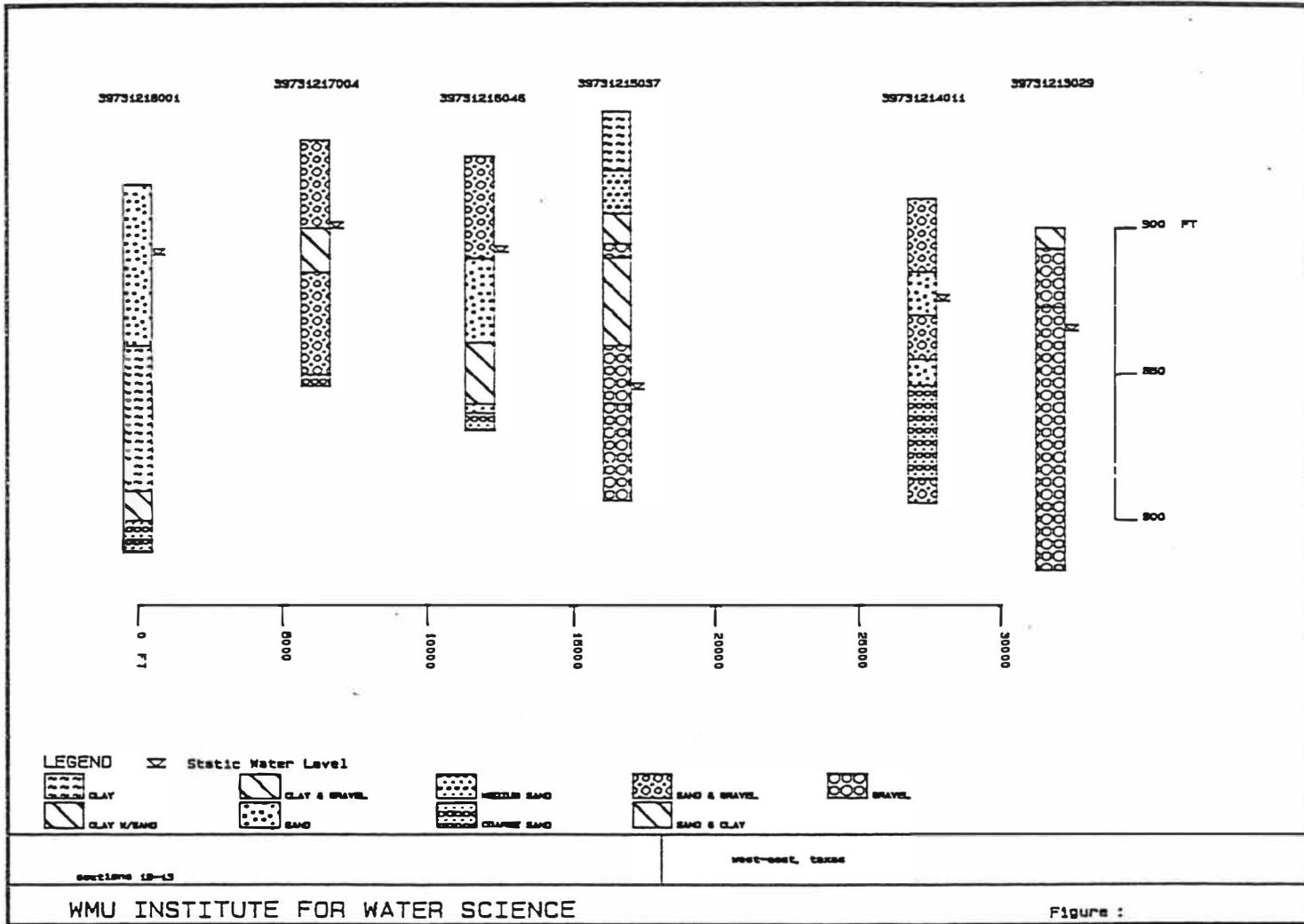


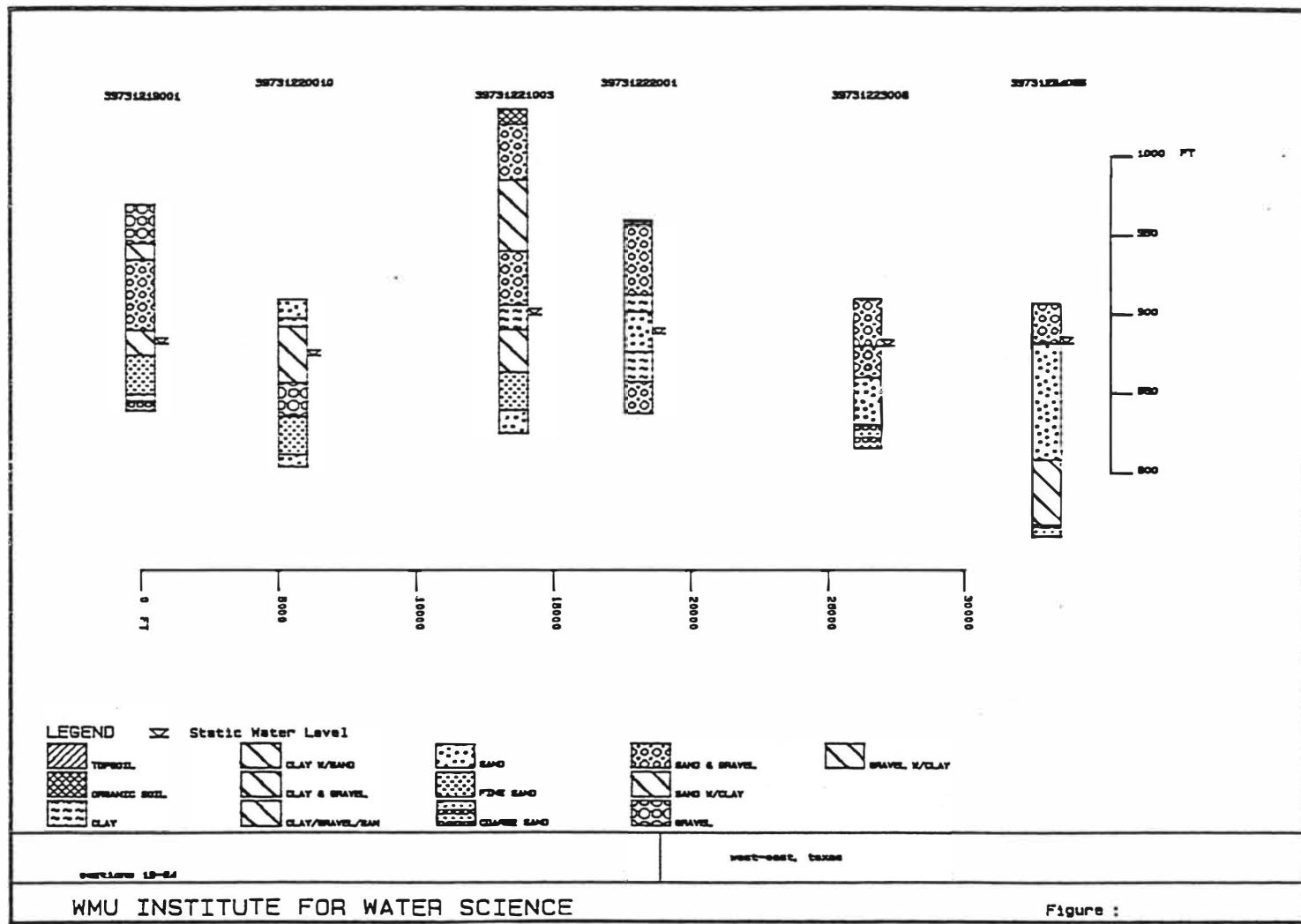


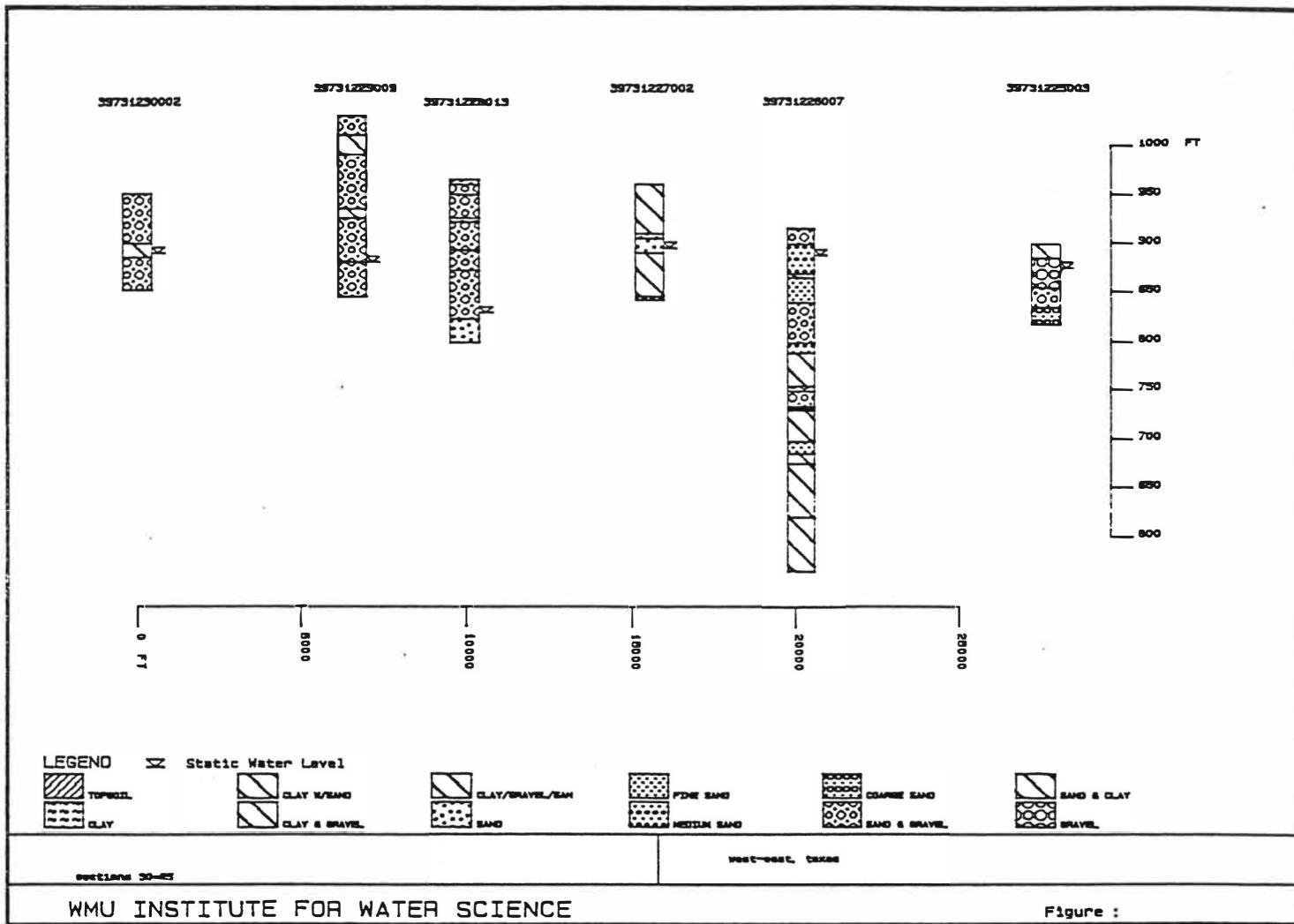


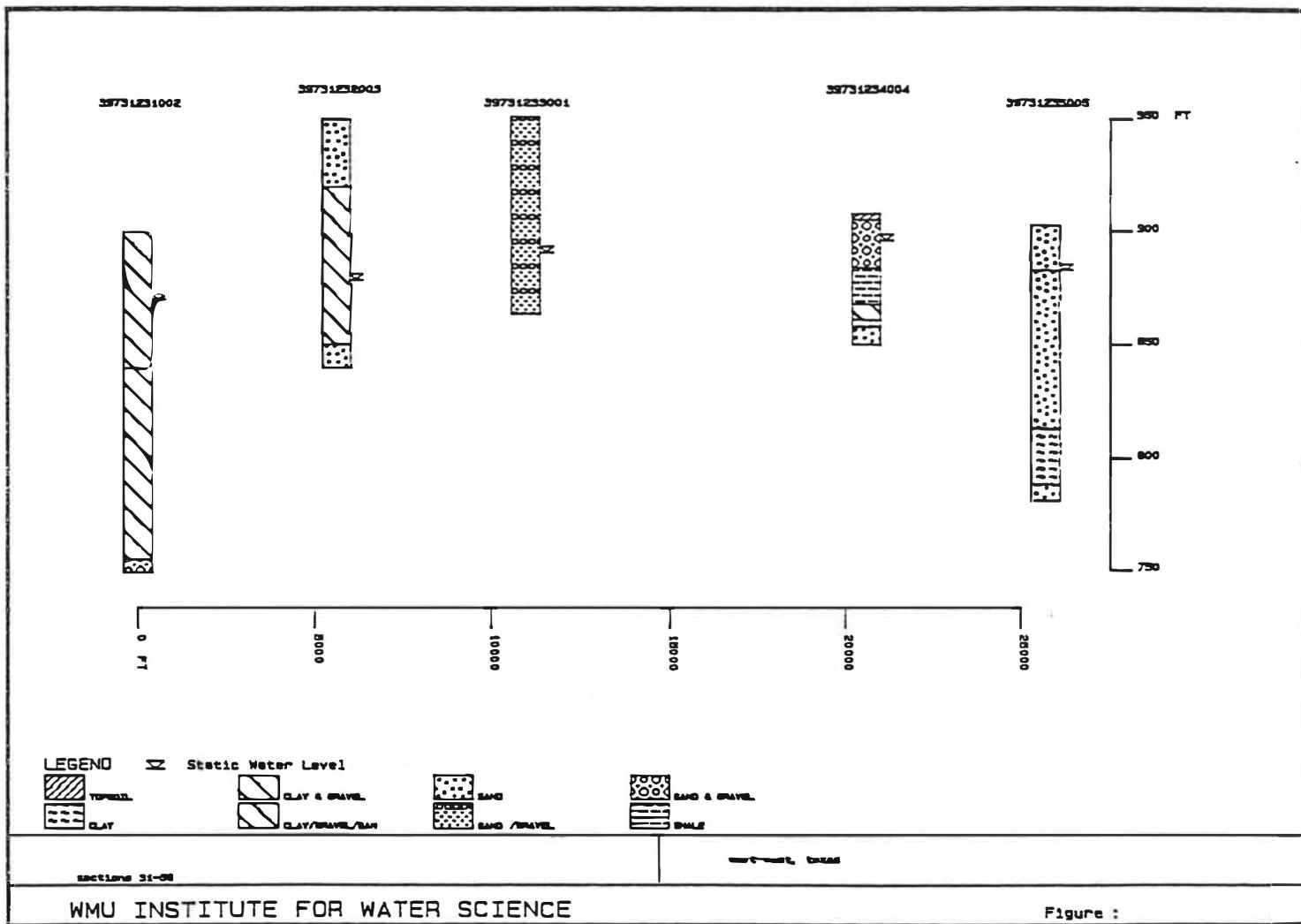


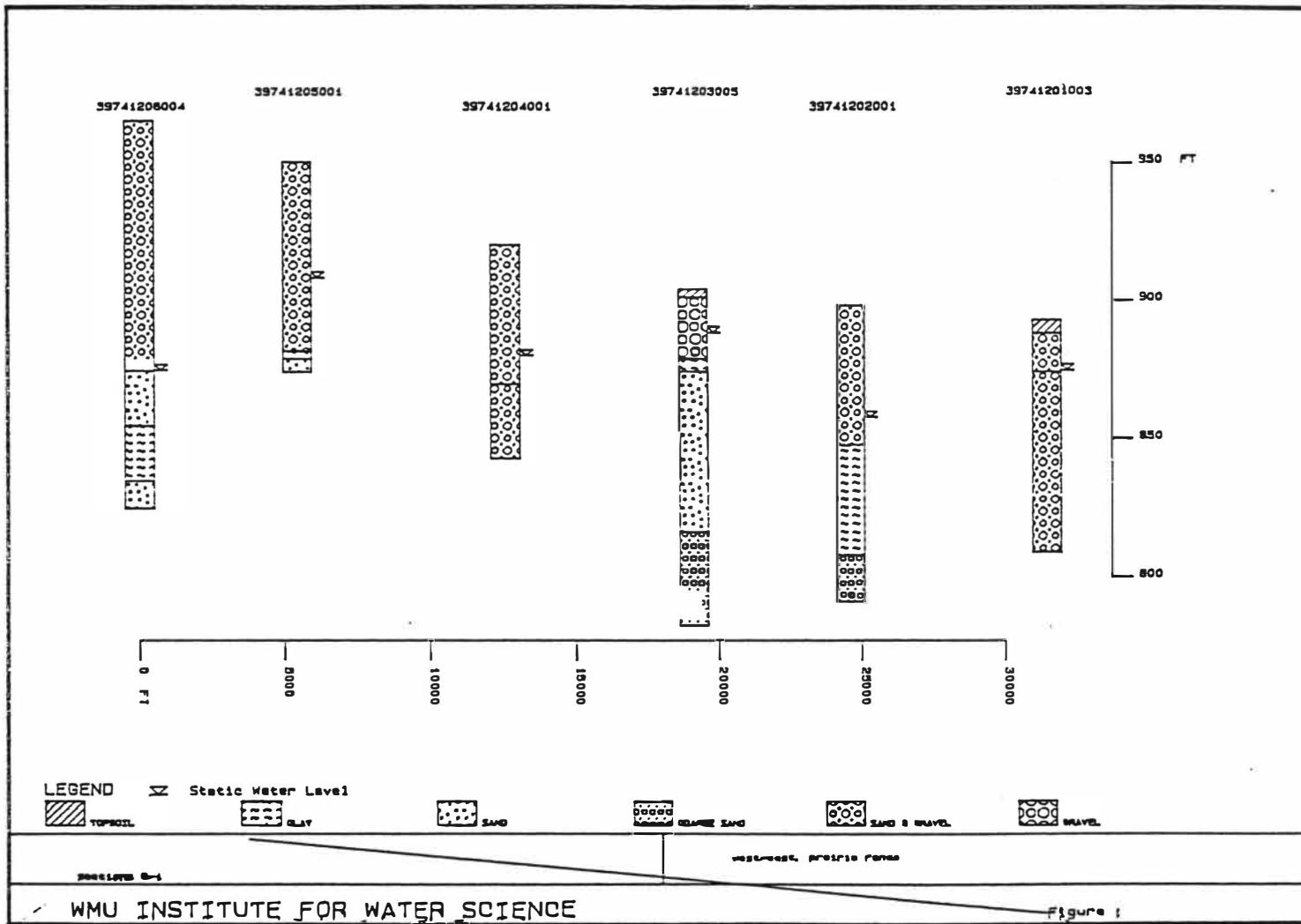


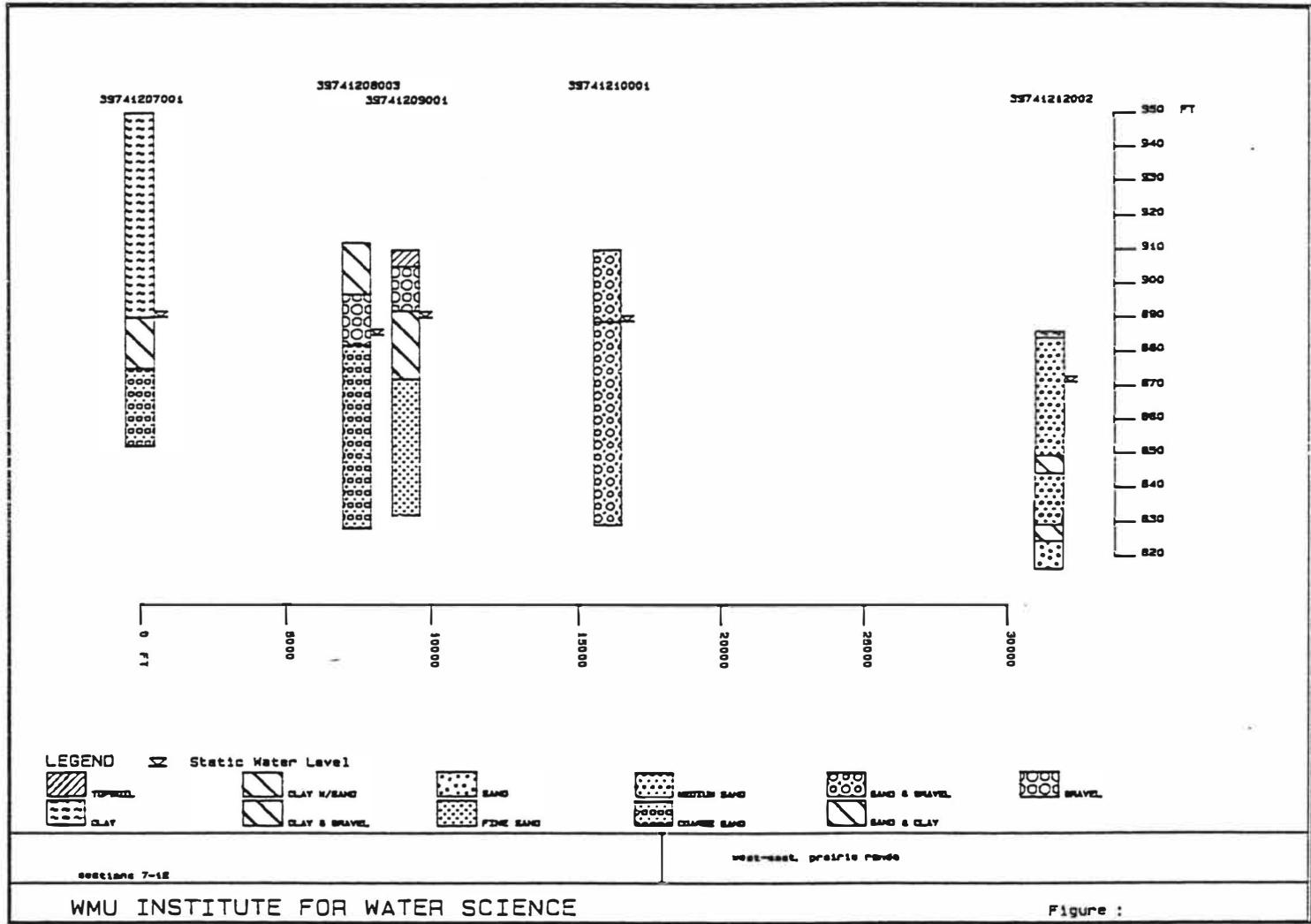


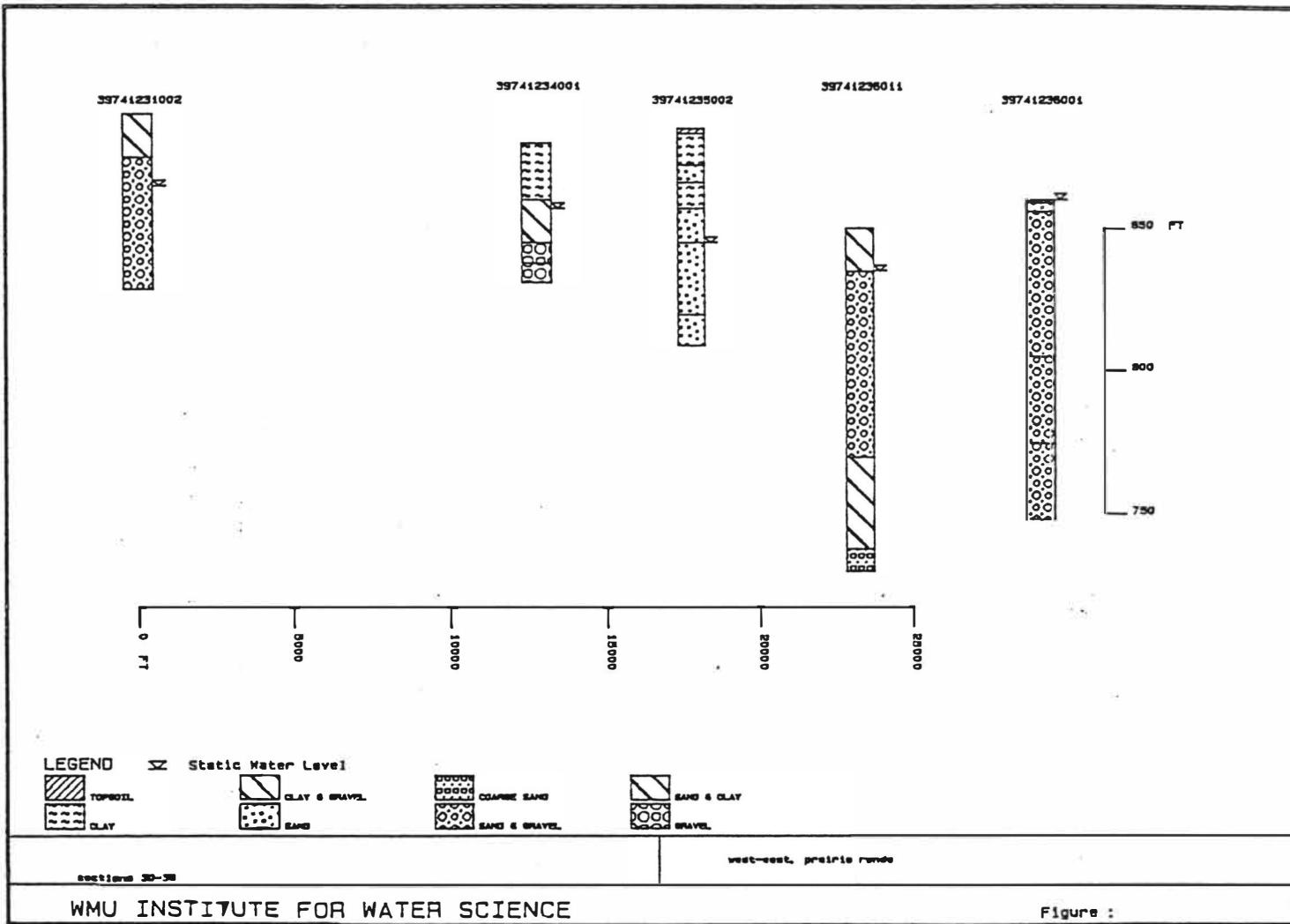


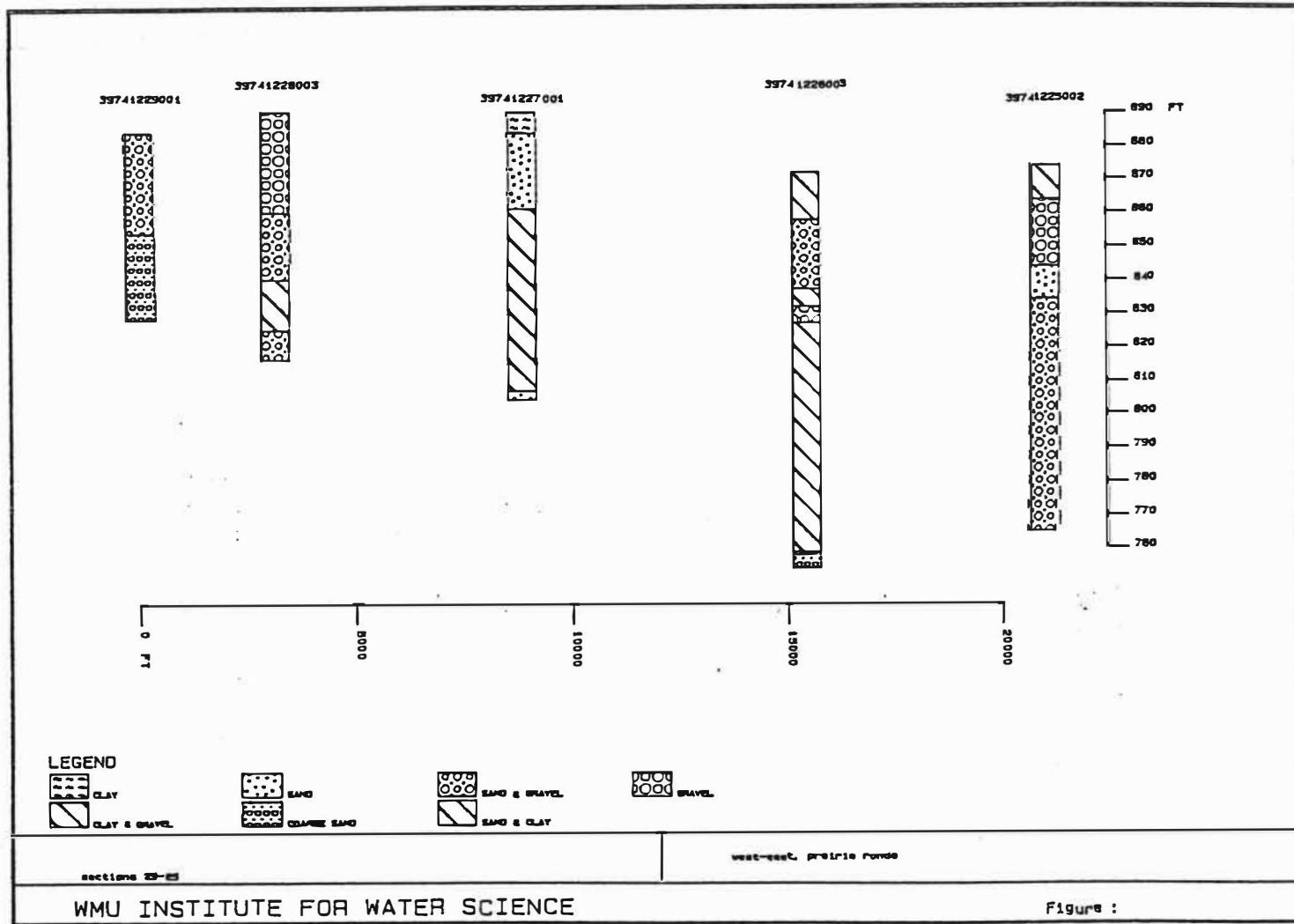


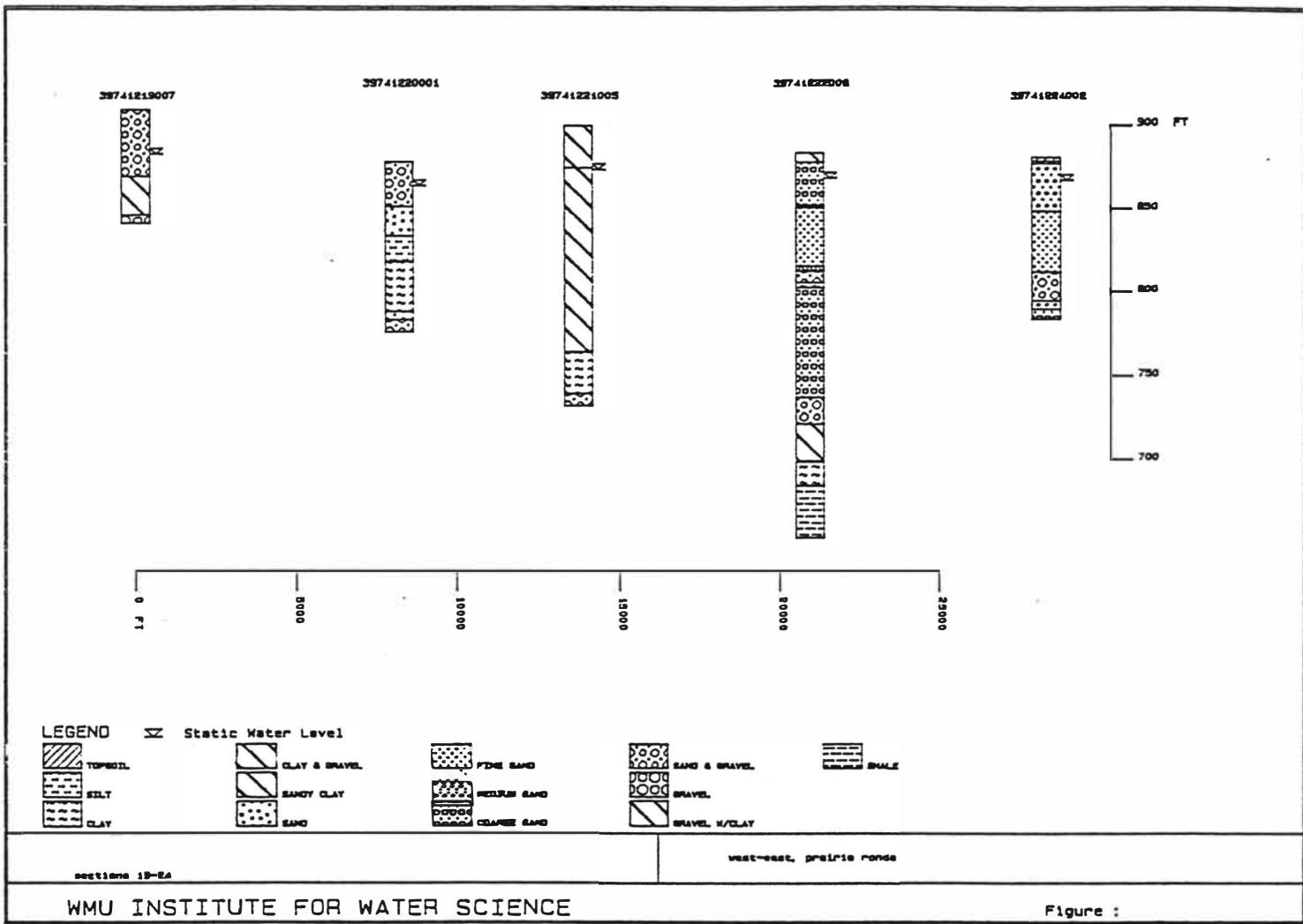


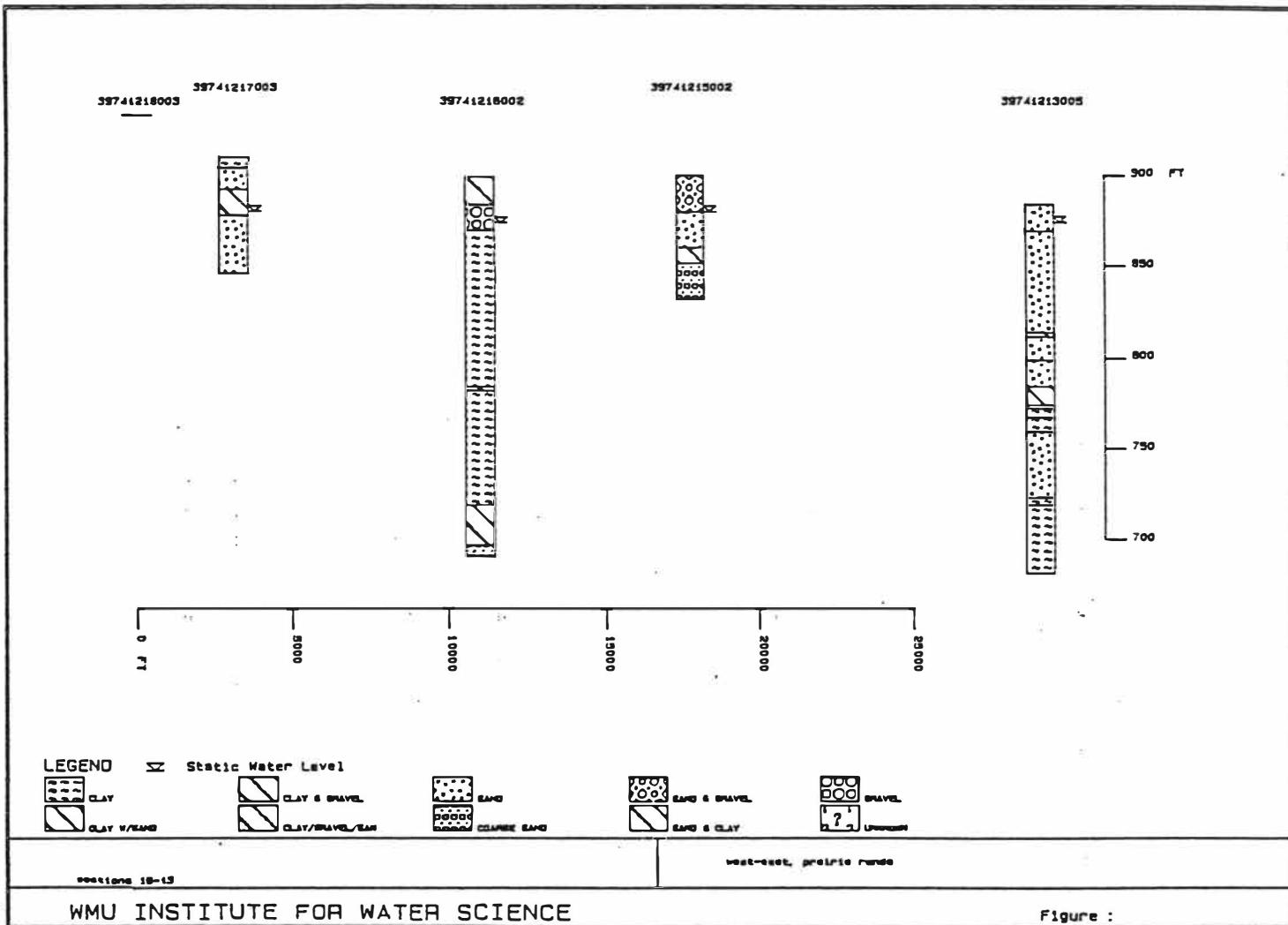


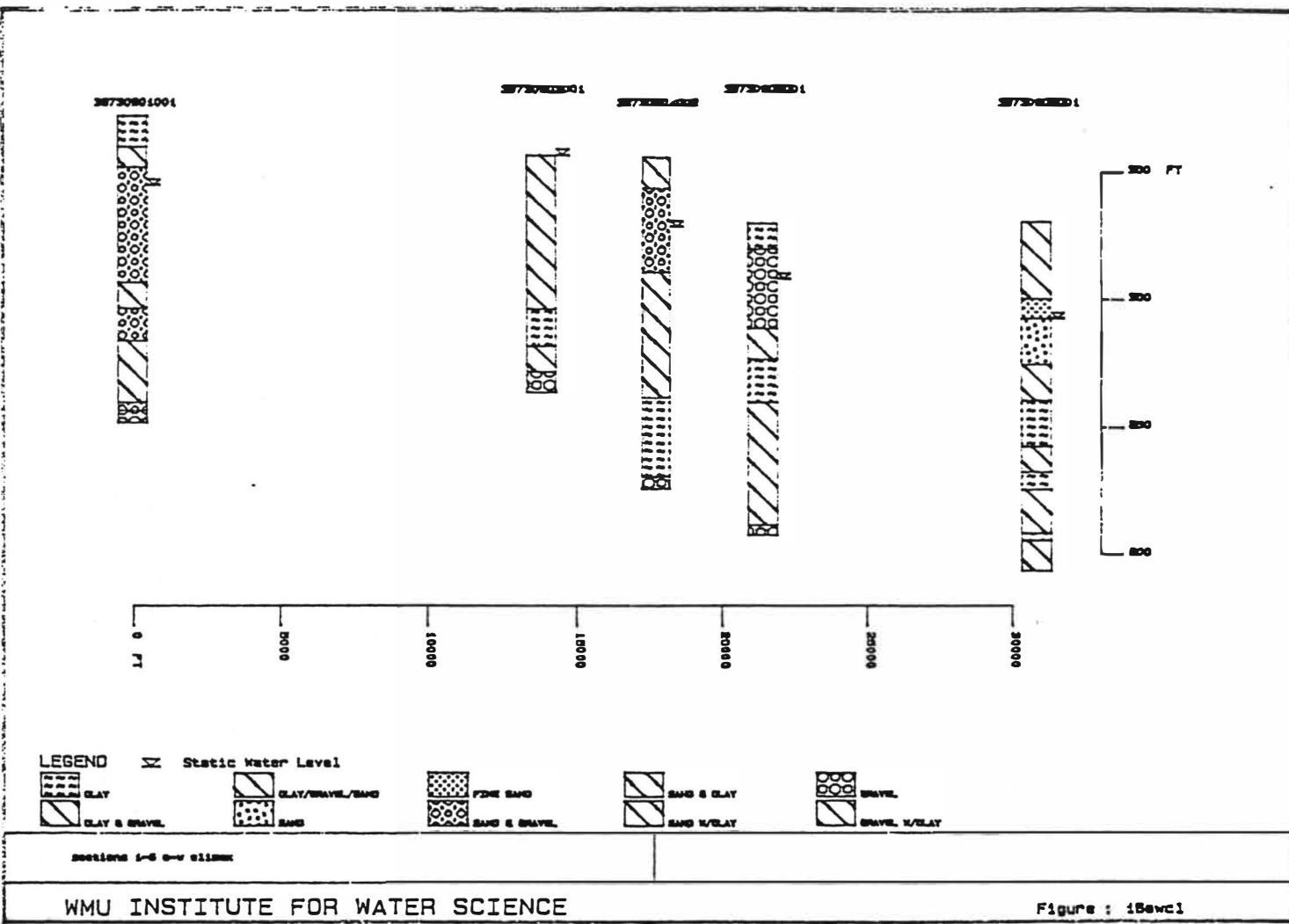


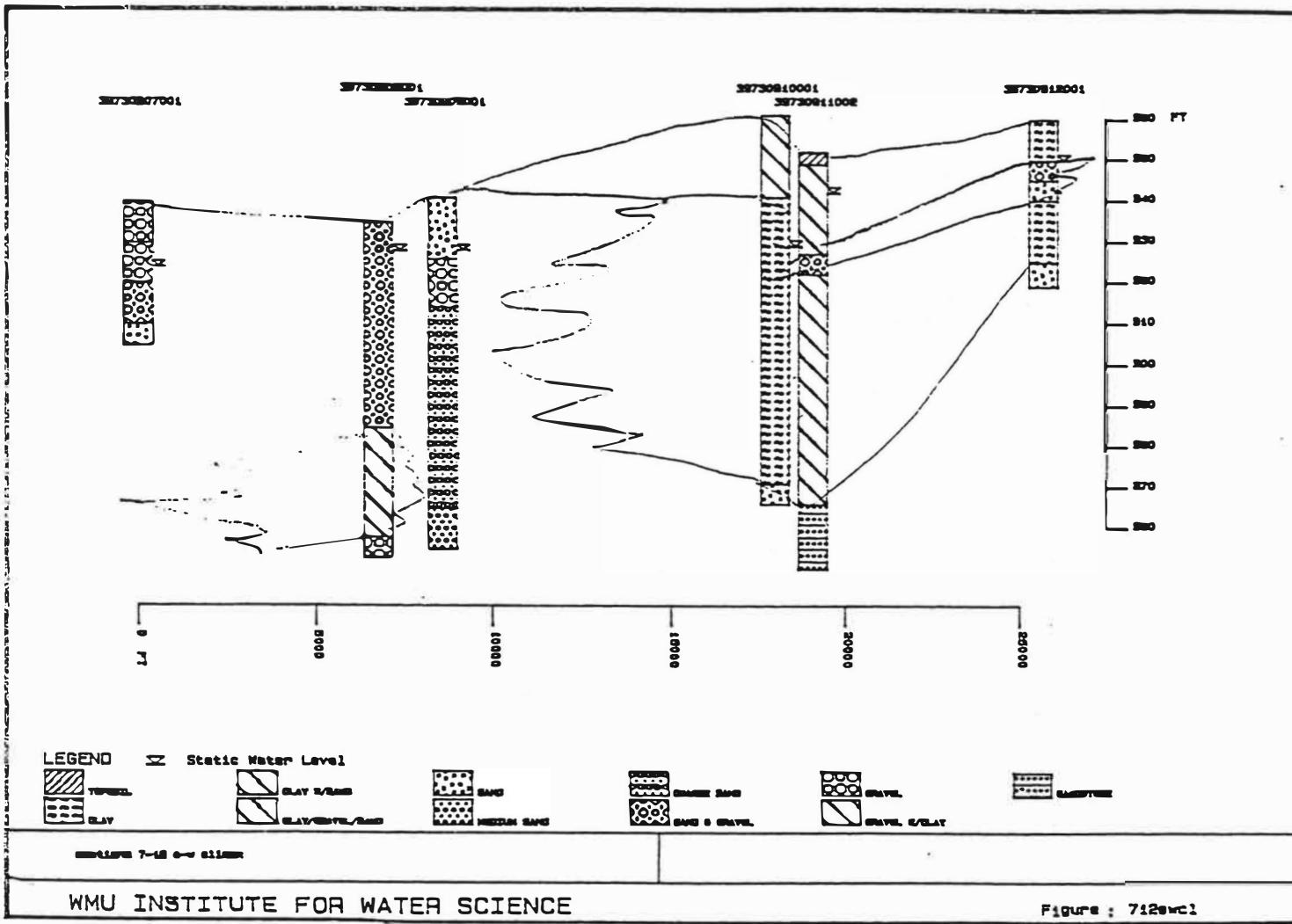


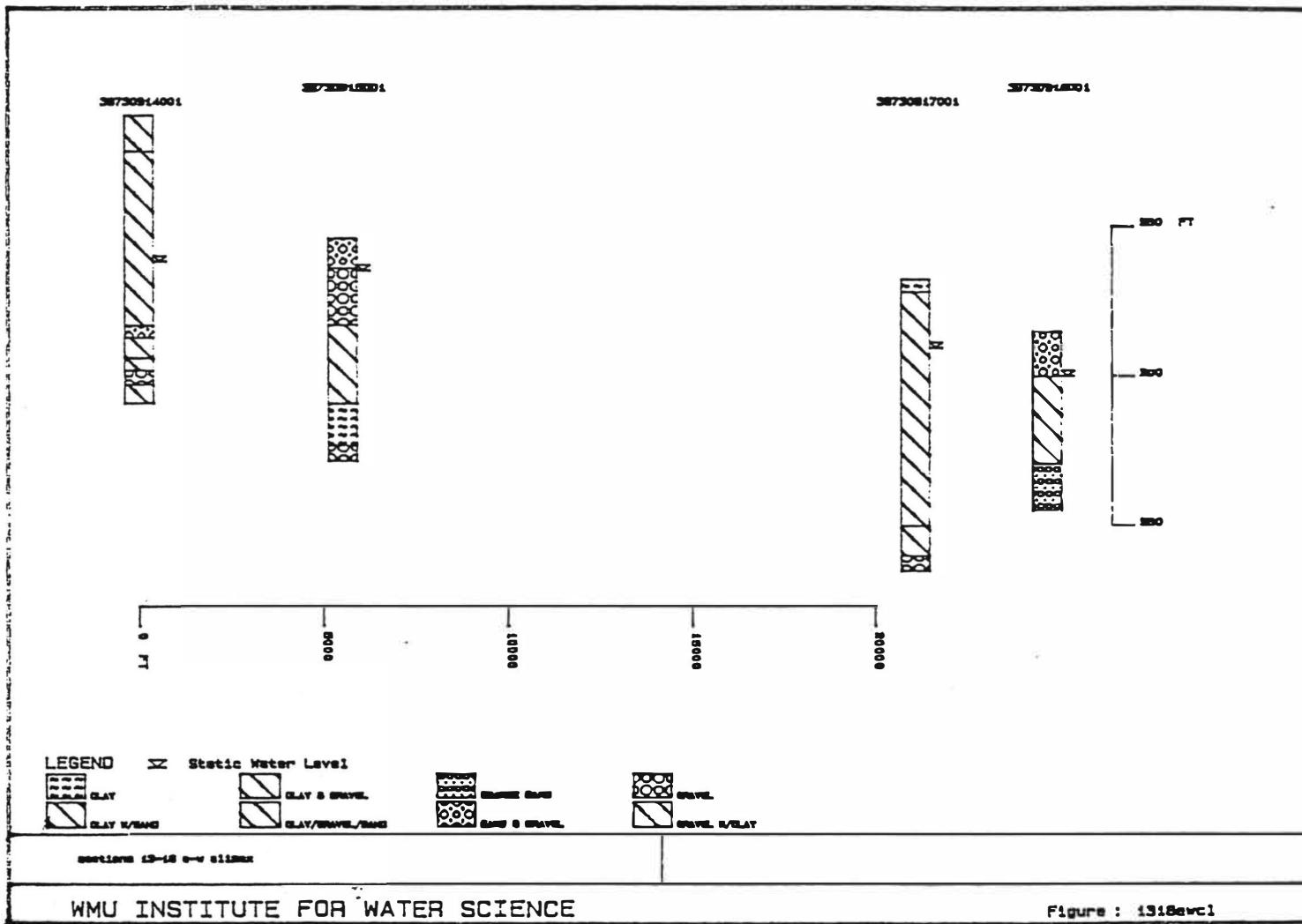


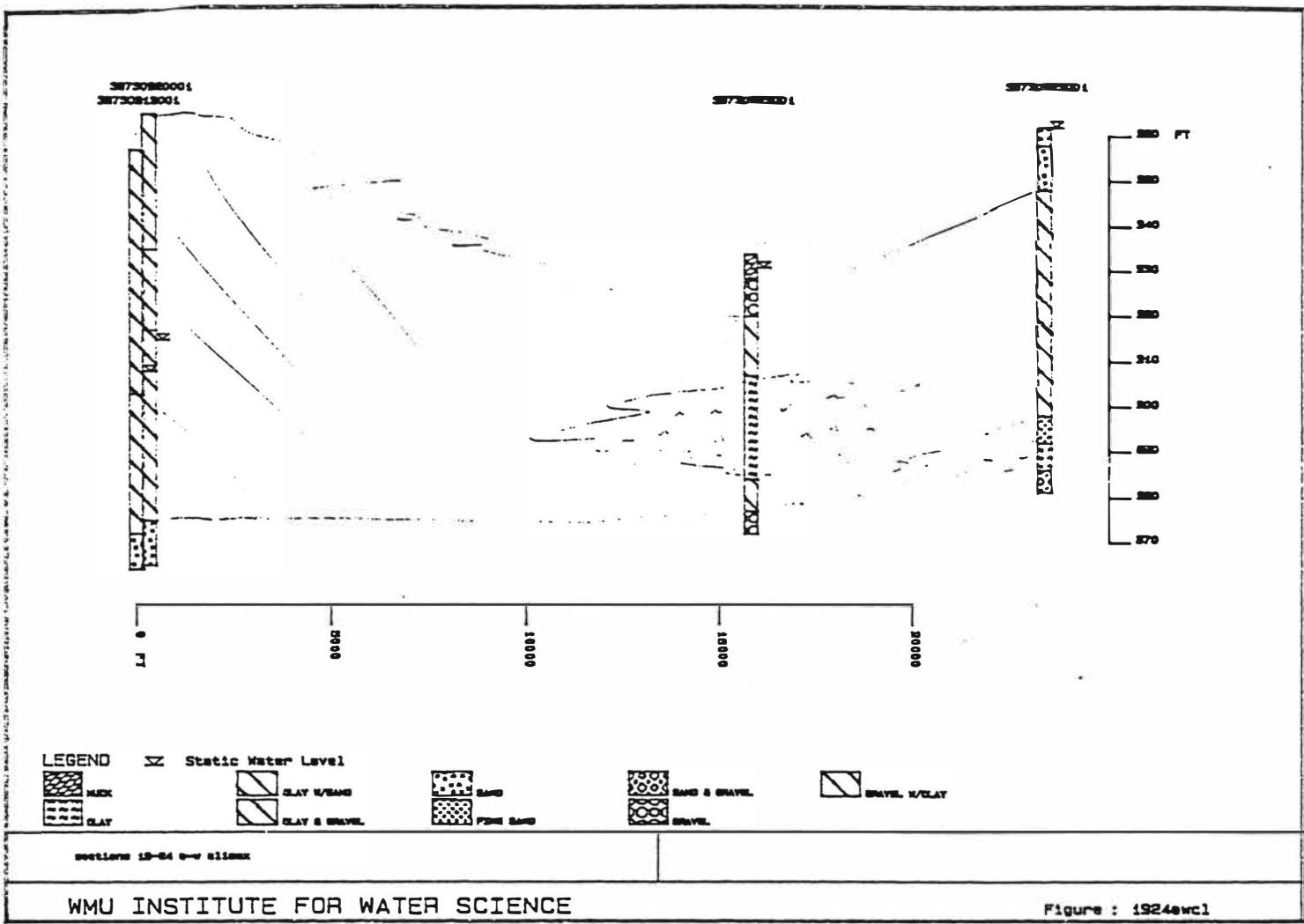


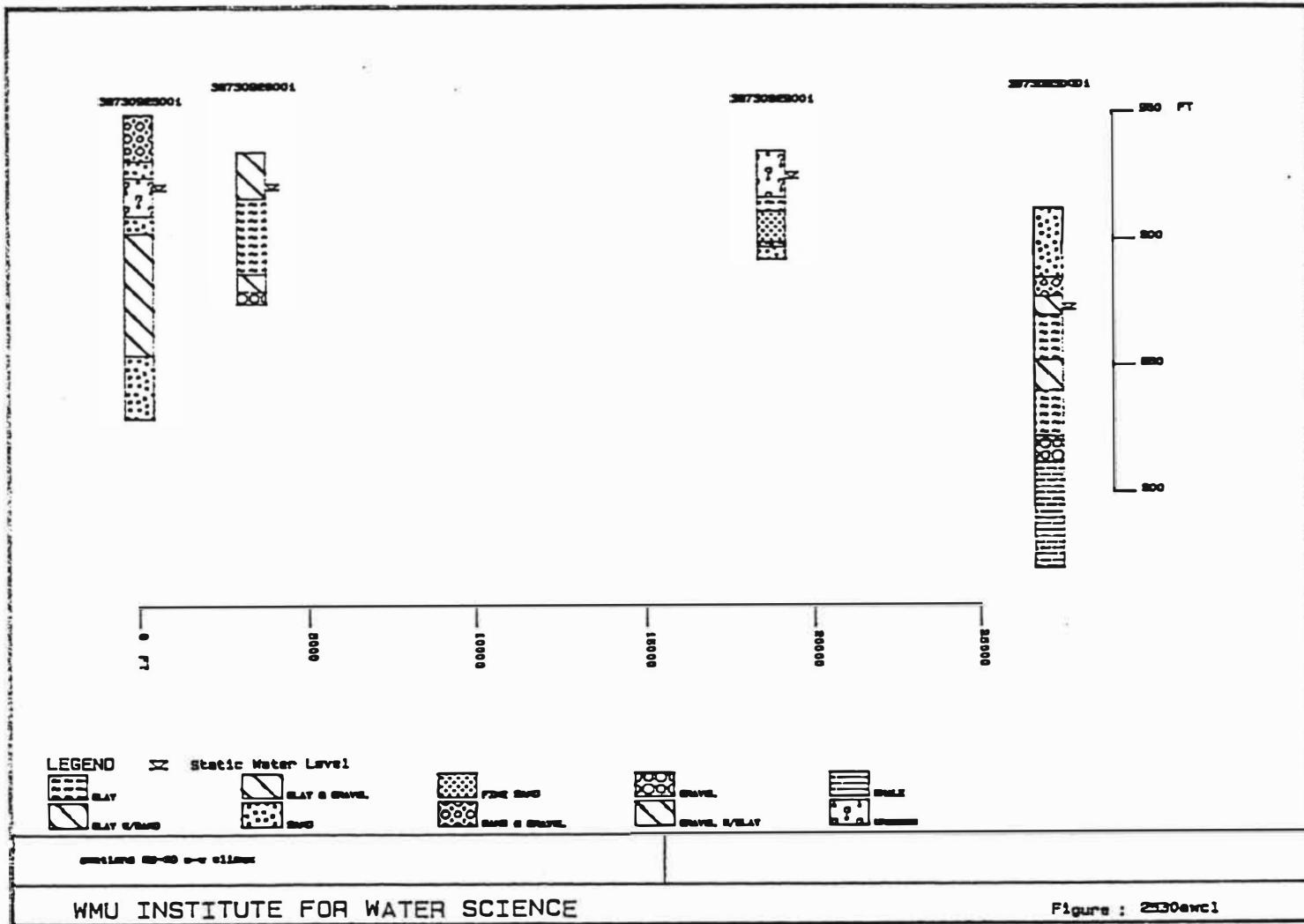


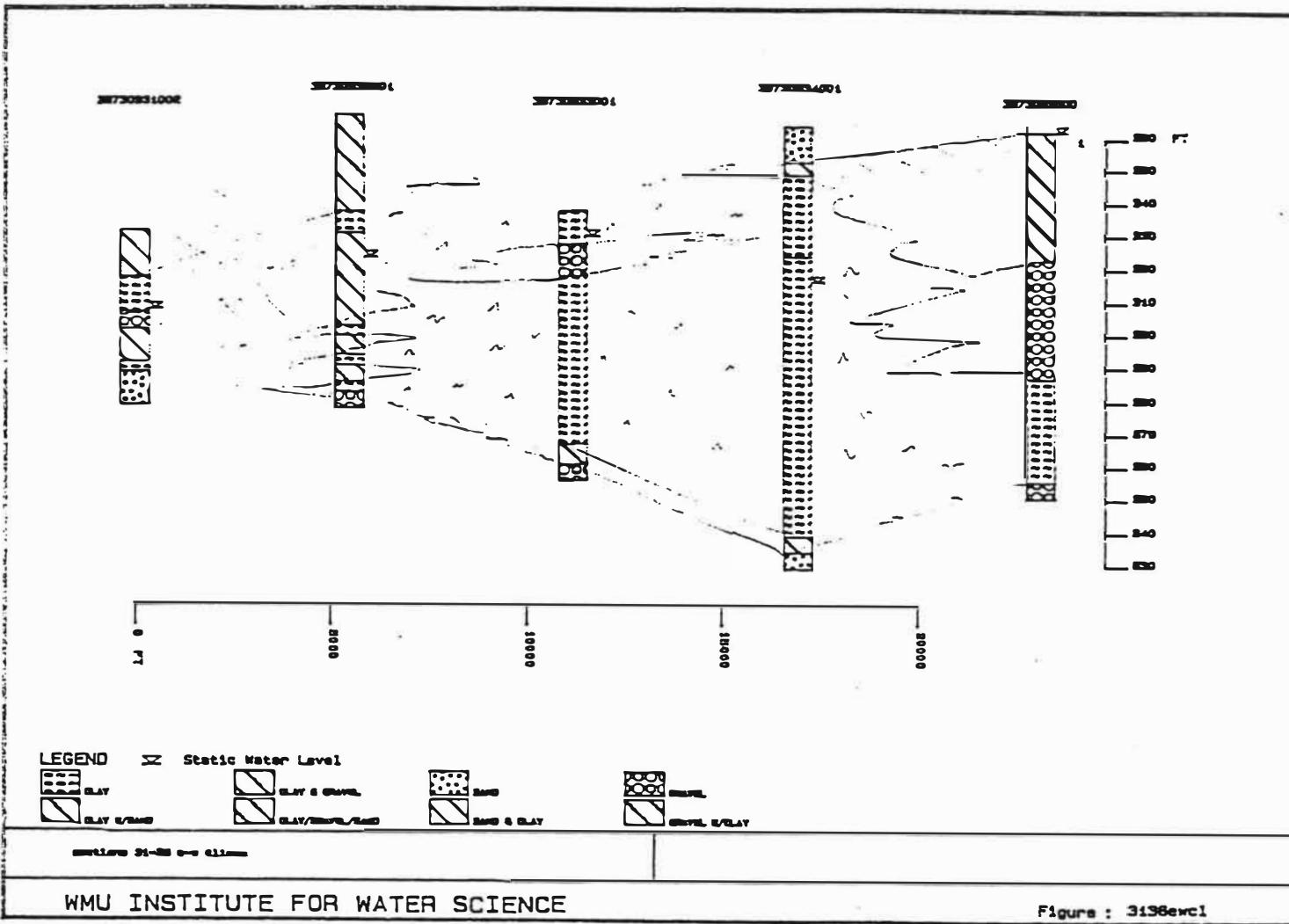


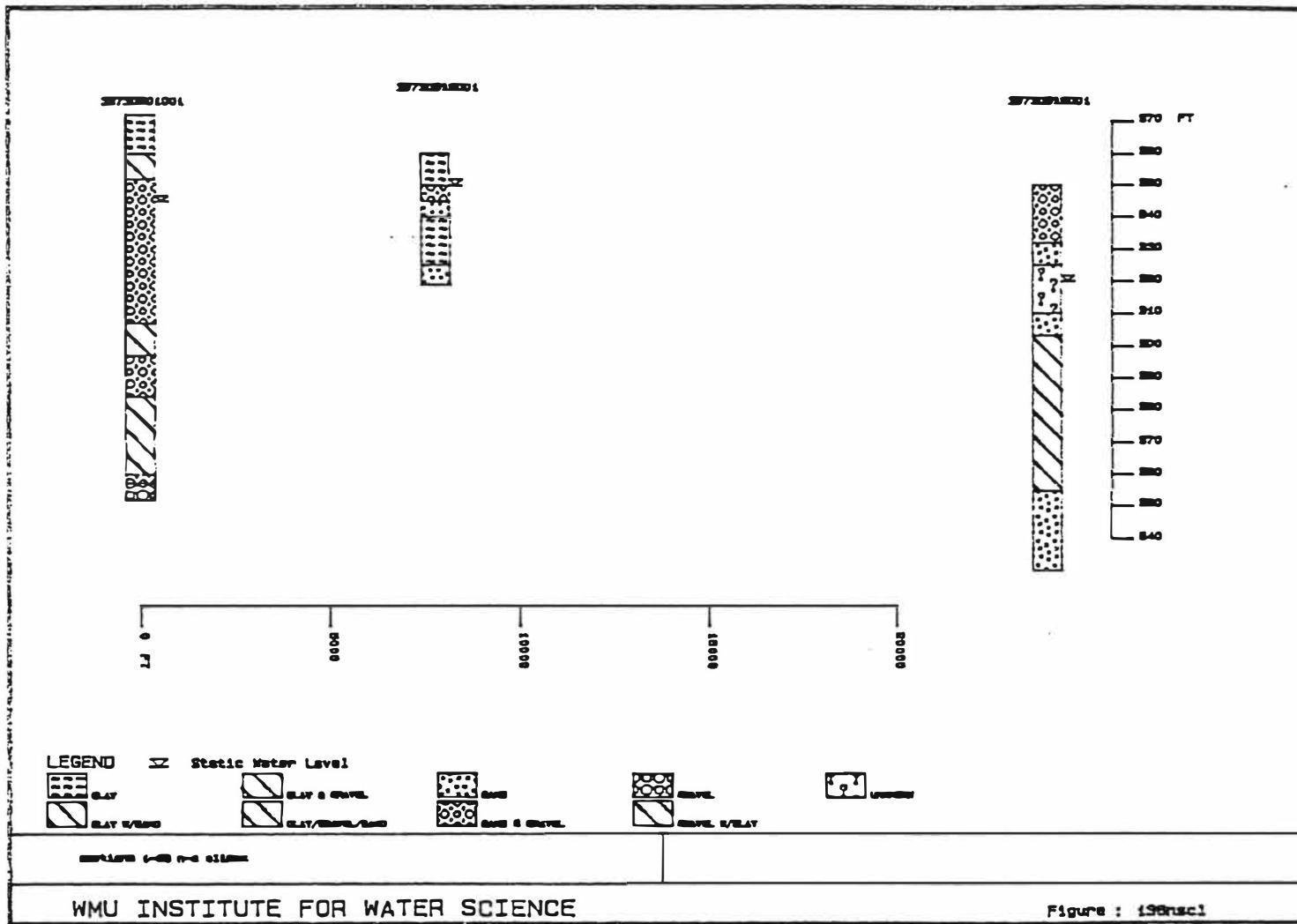


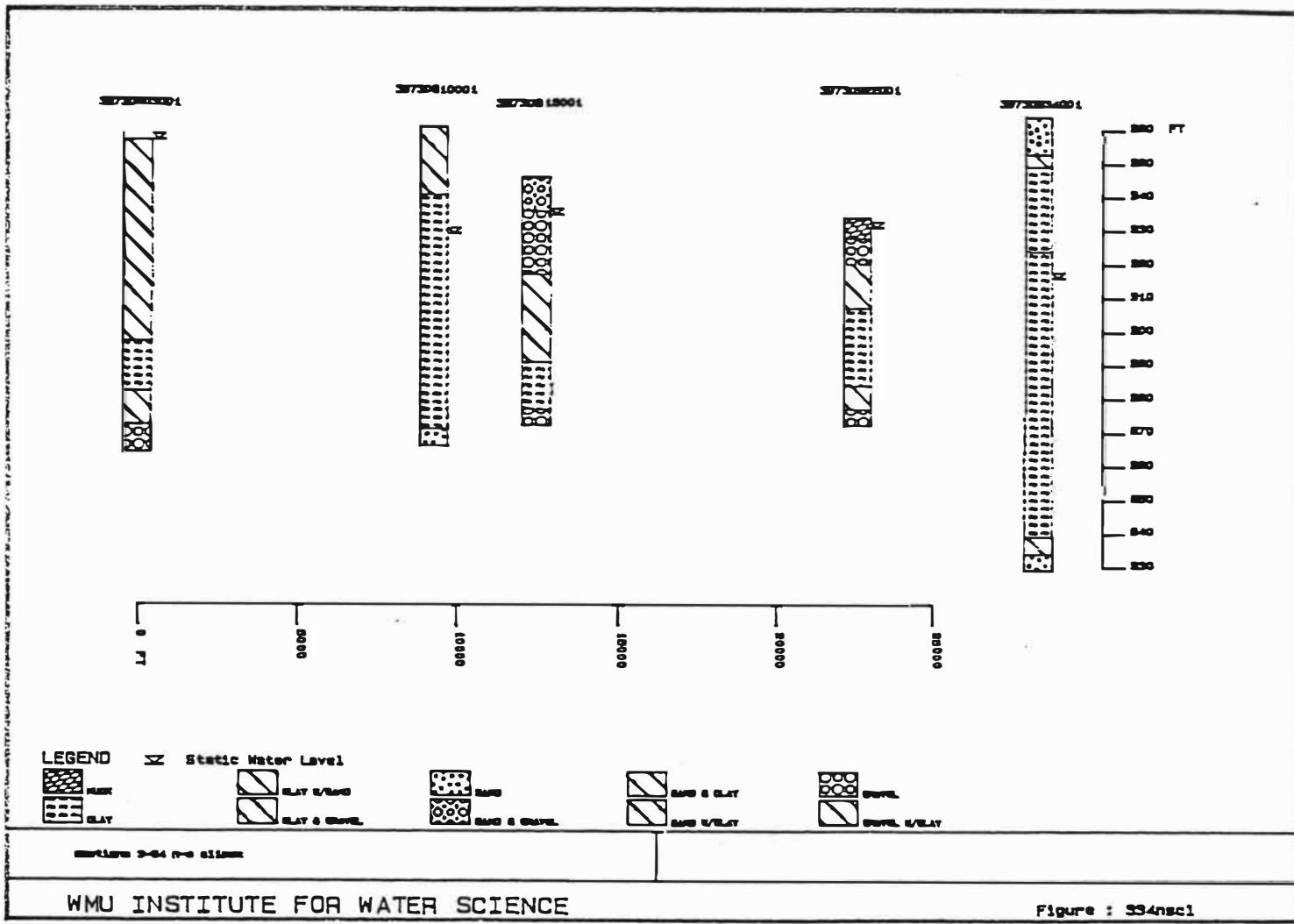


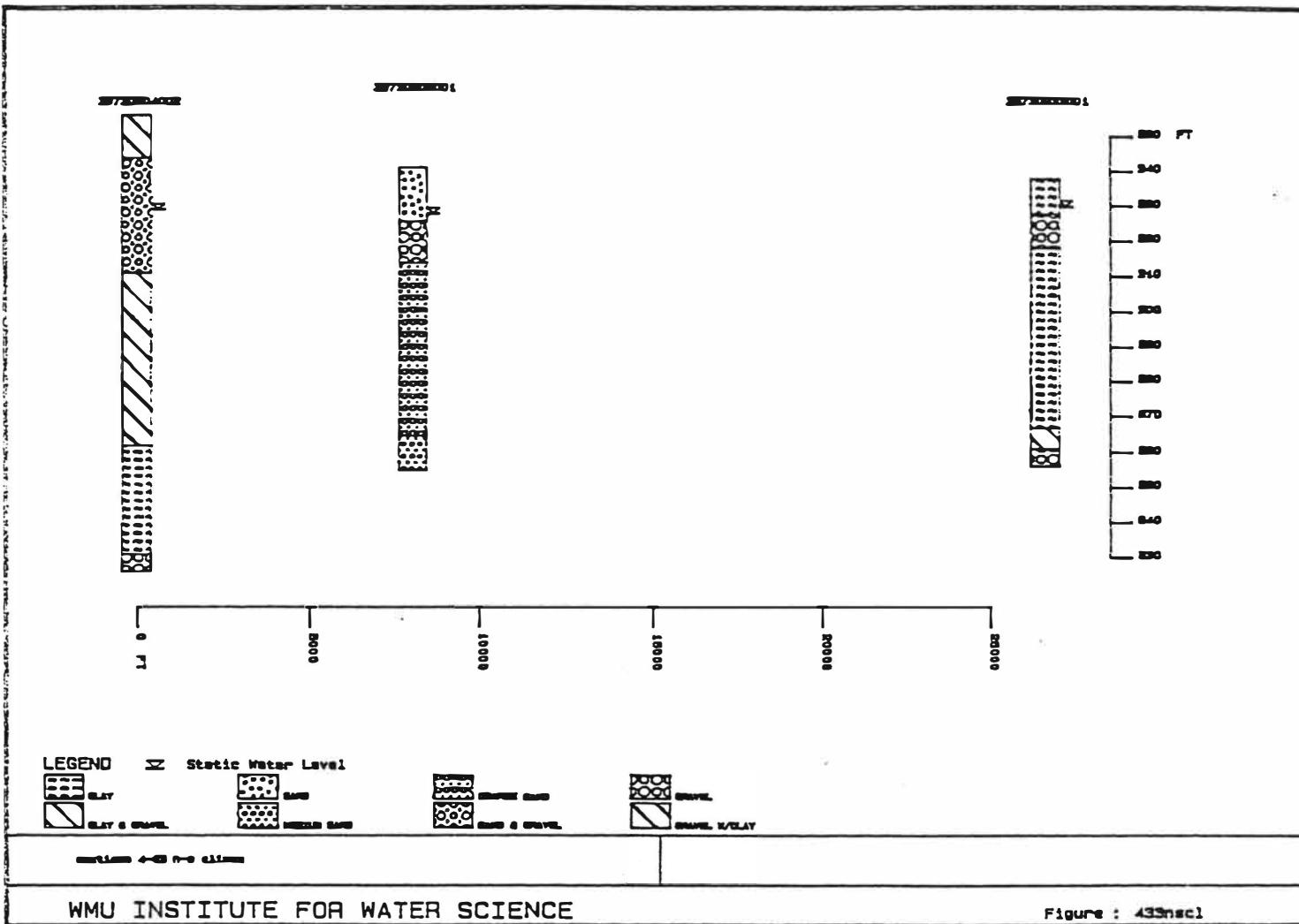


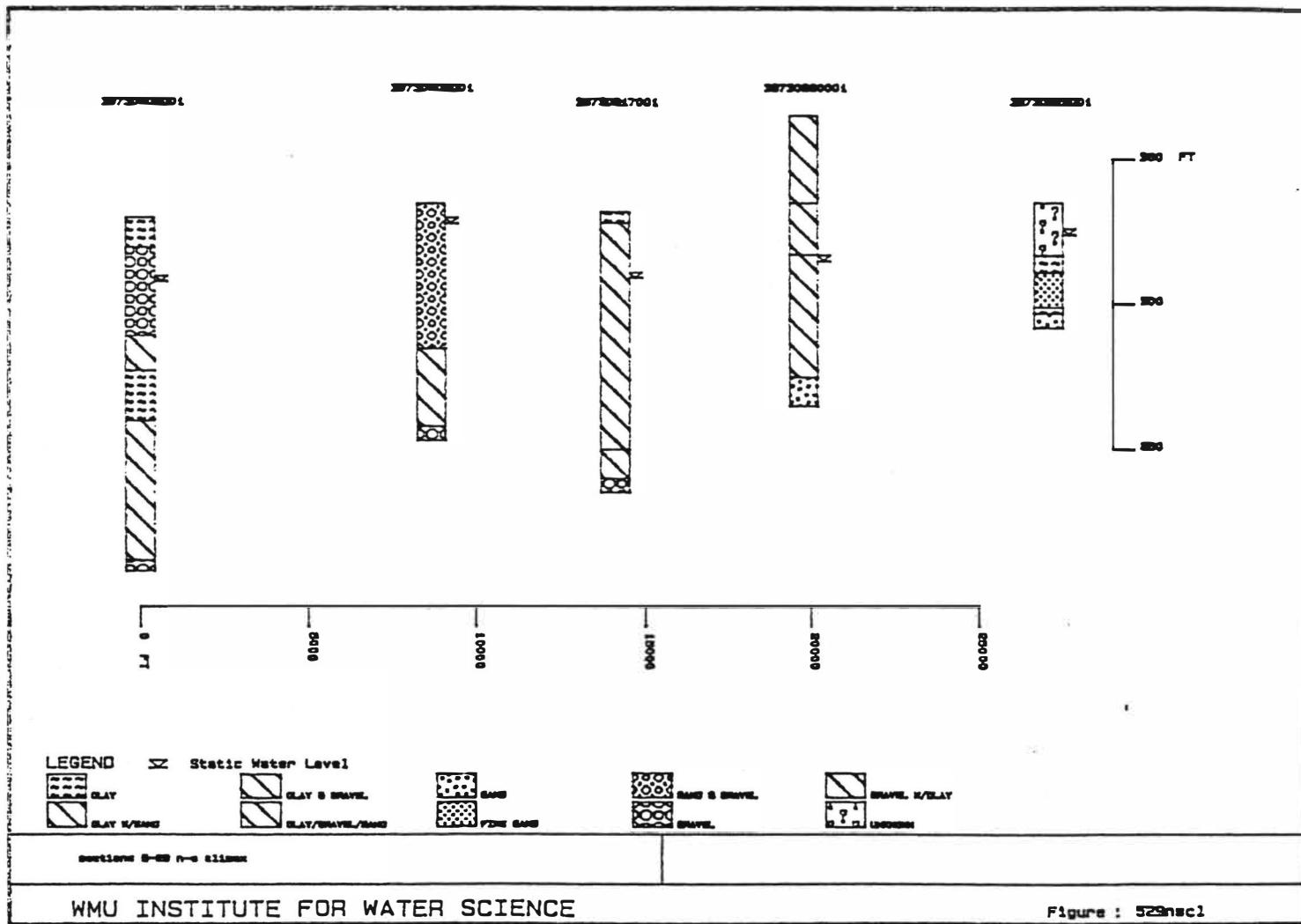


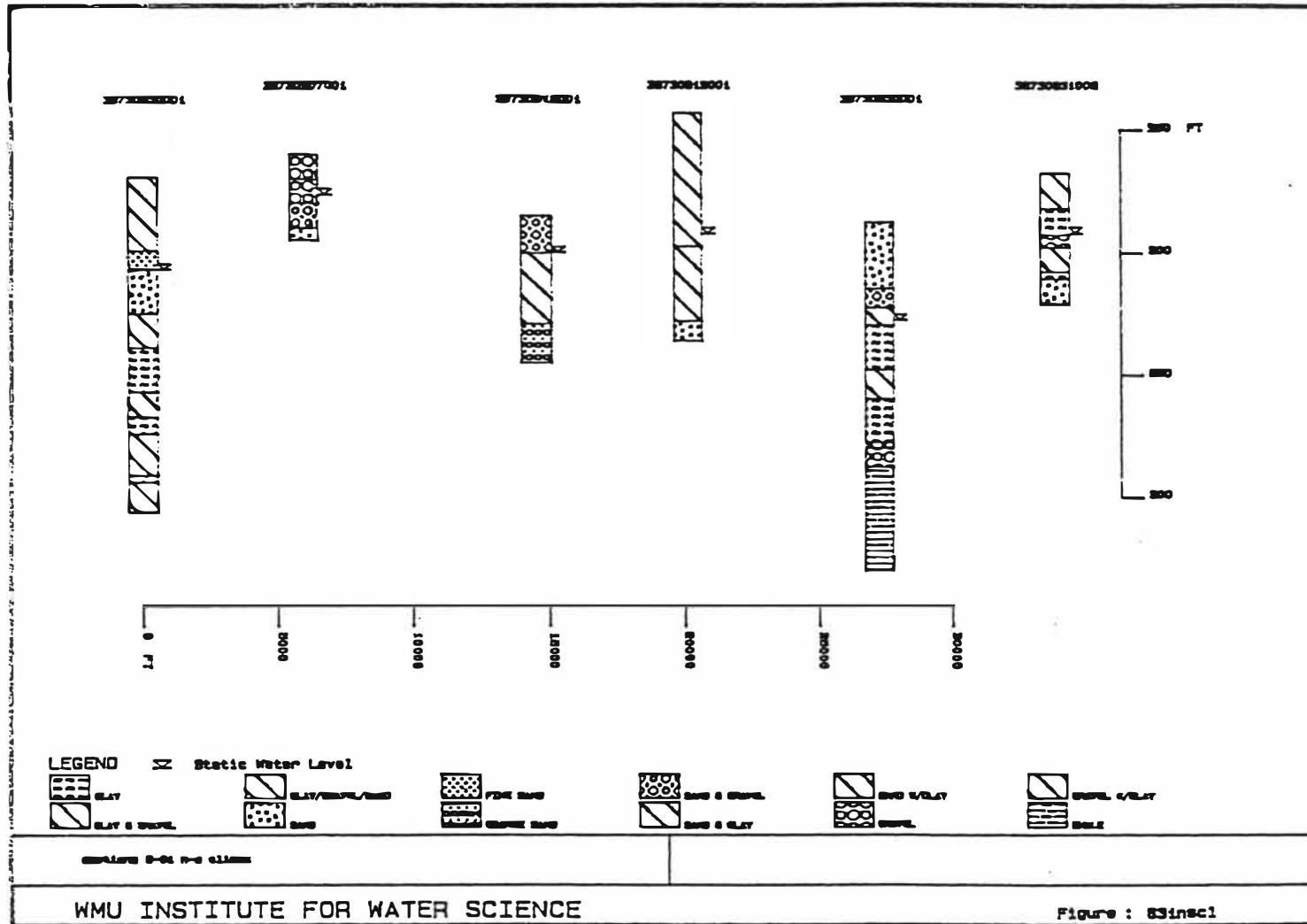


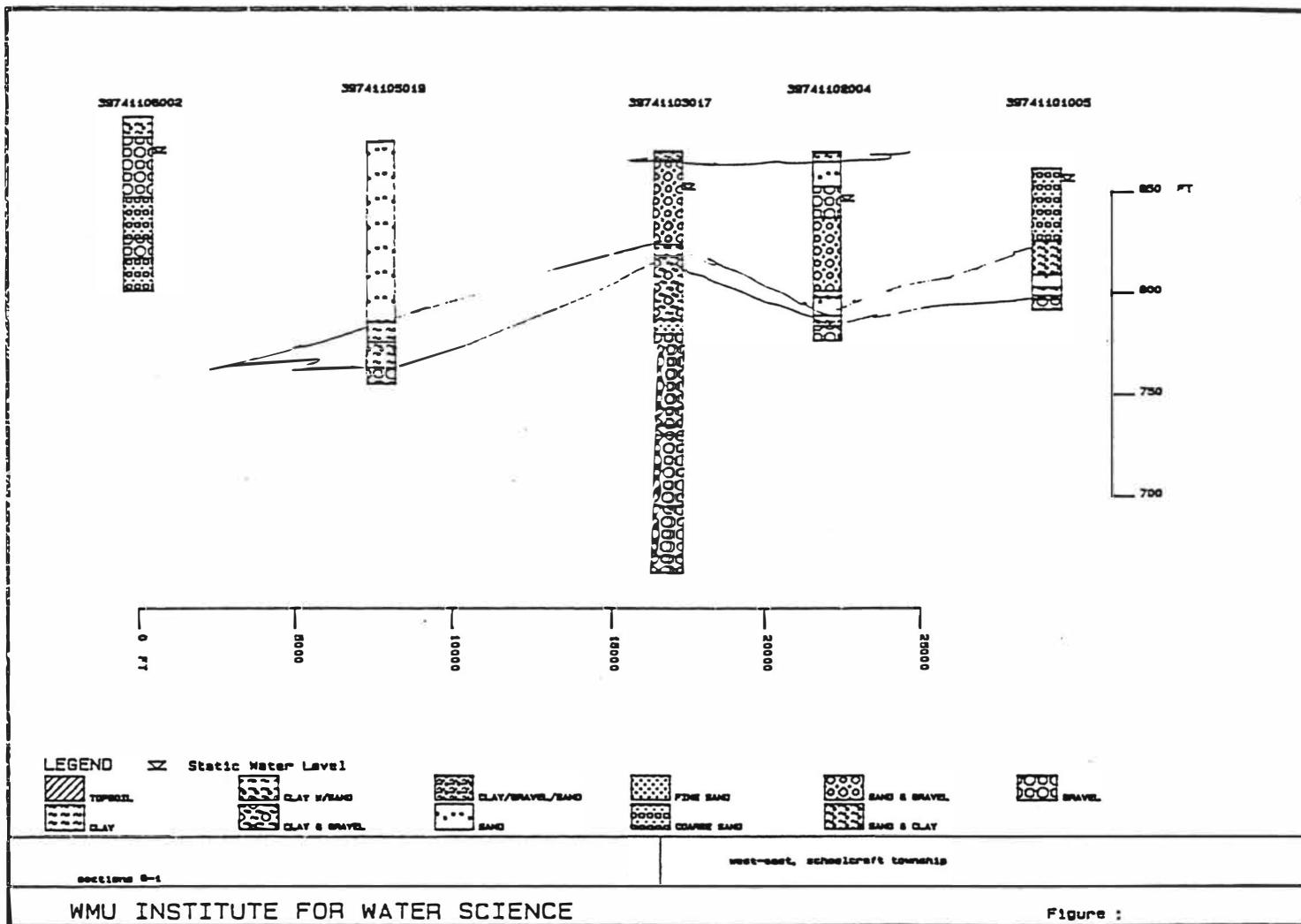


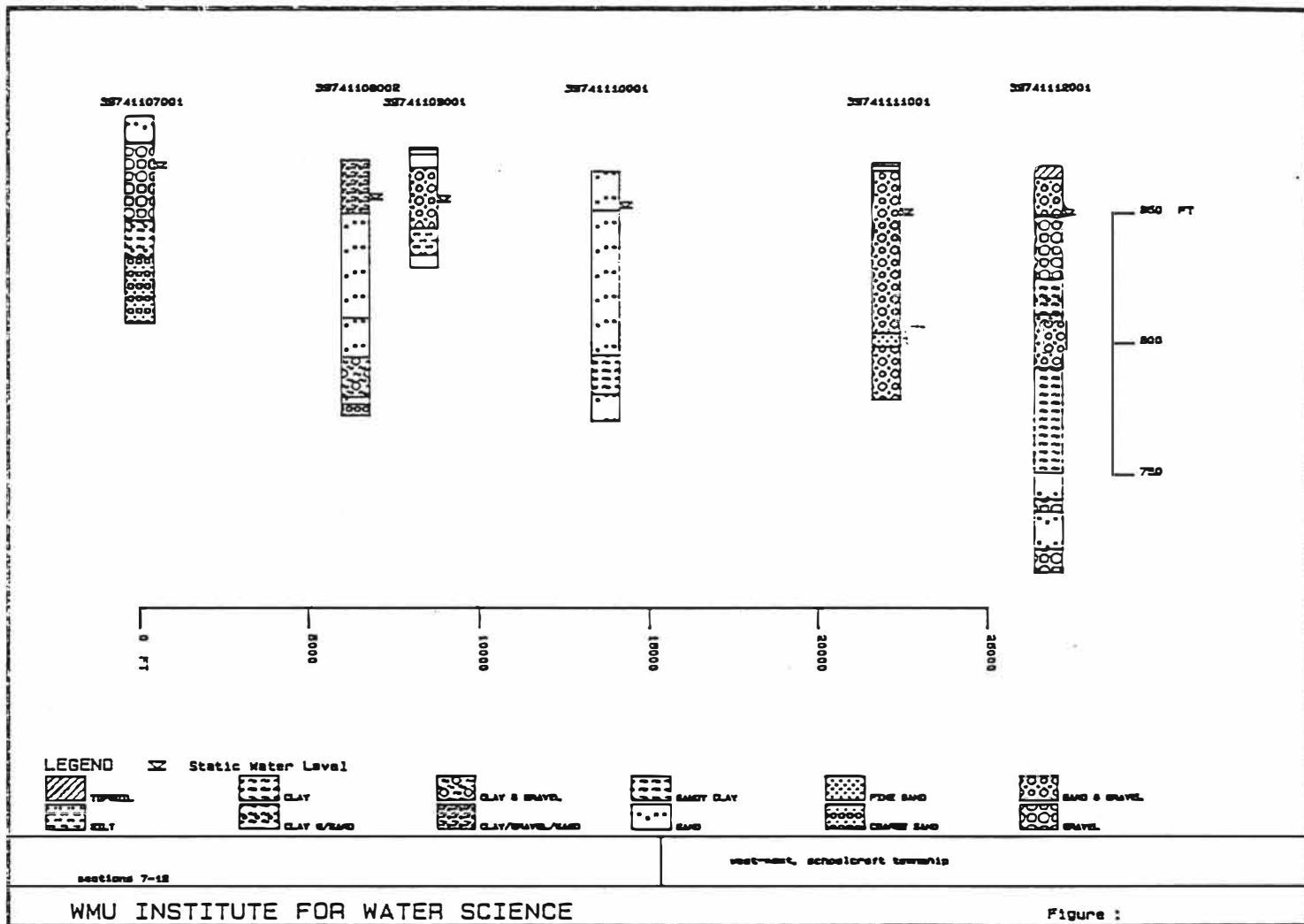








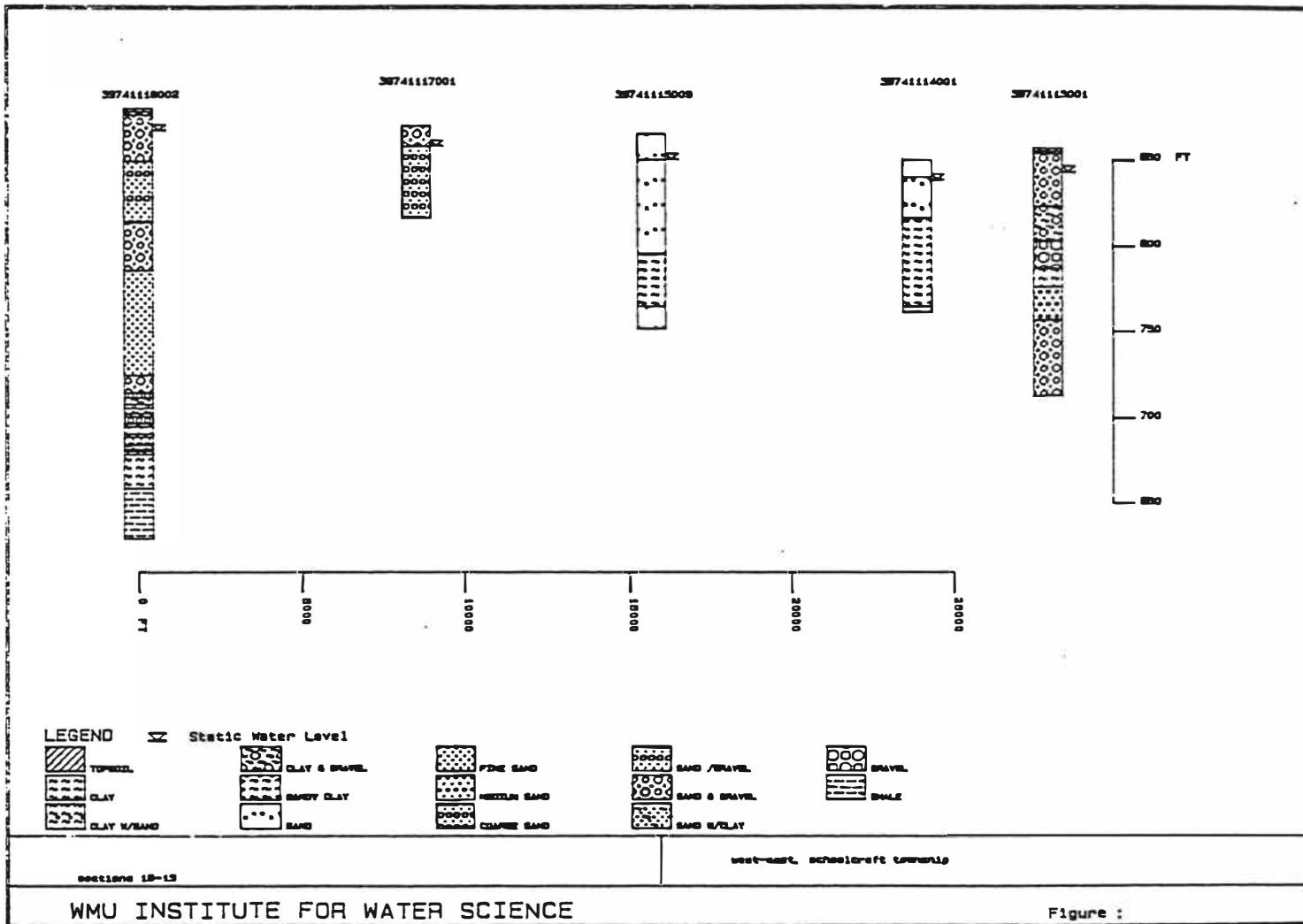


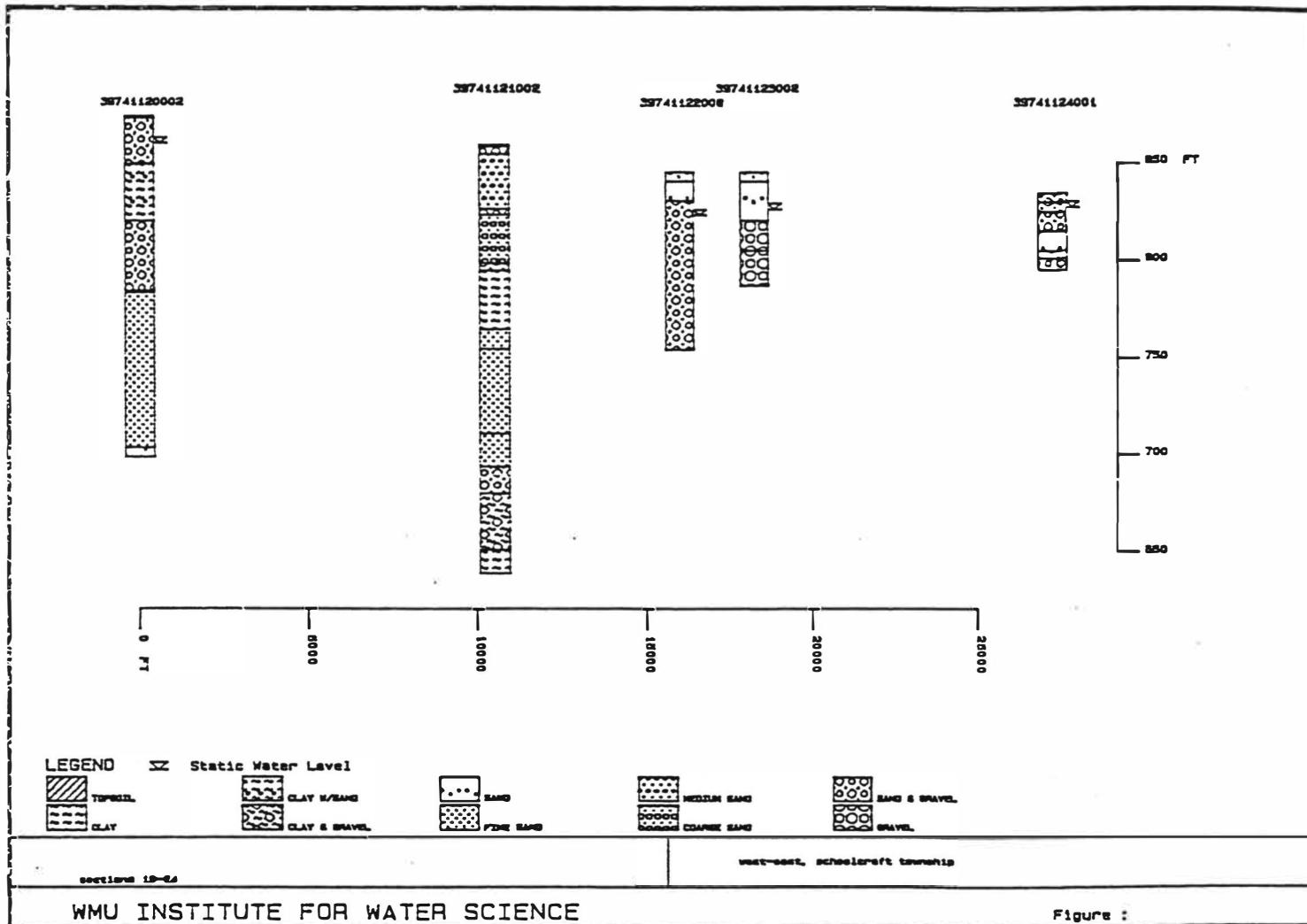


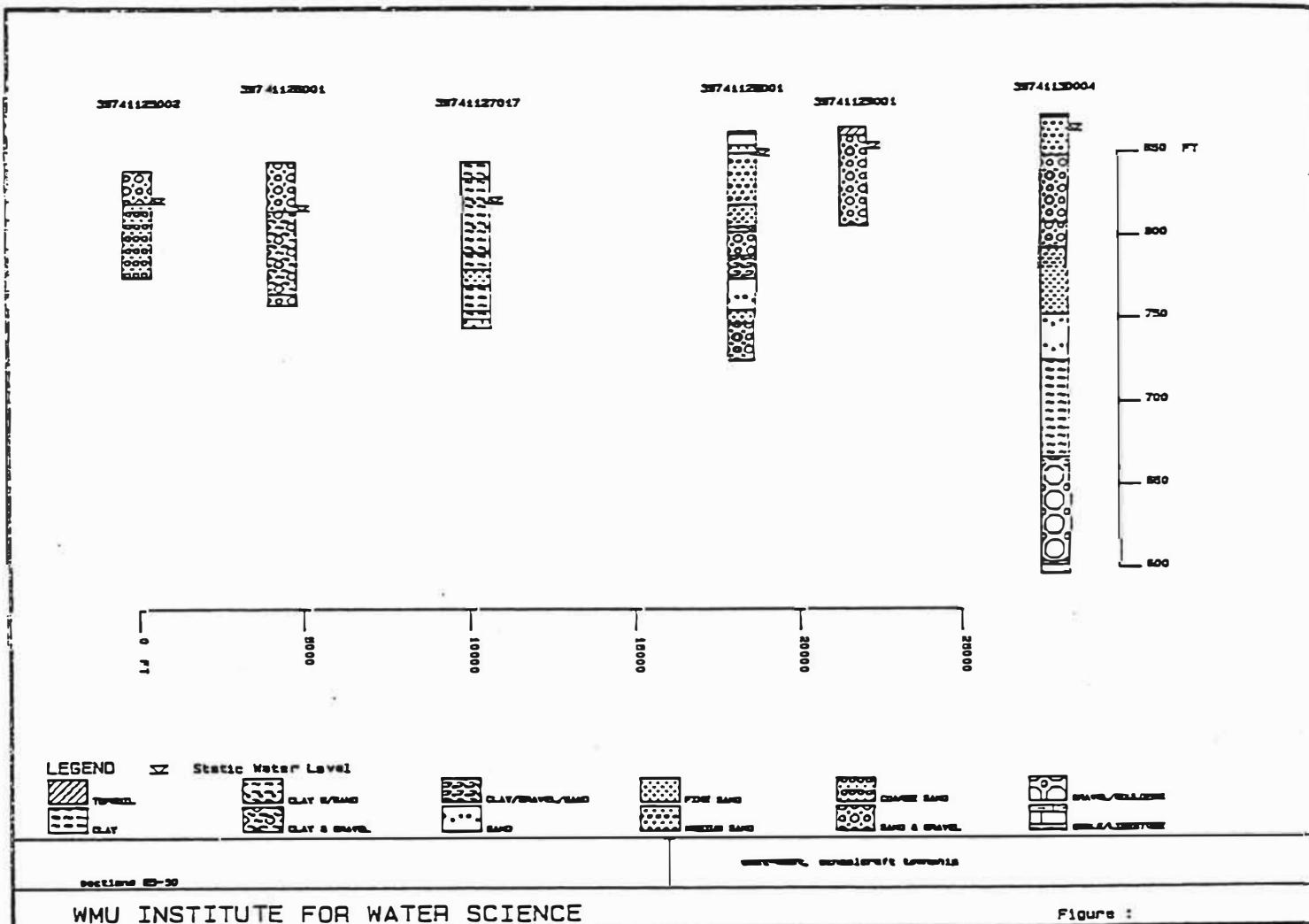
sections 7-12

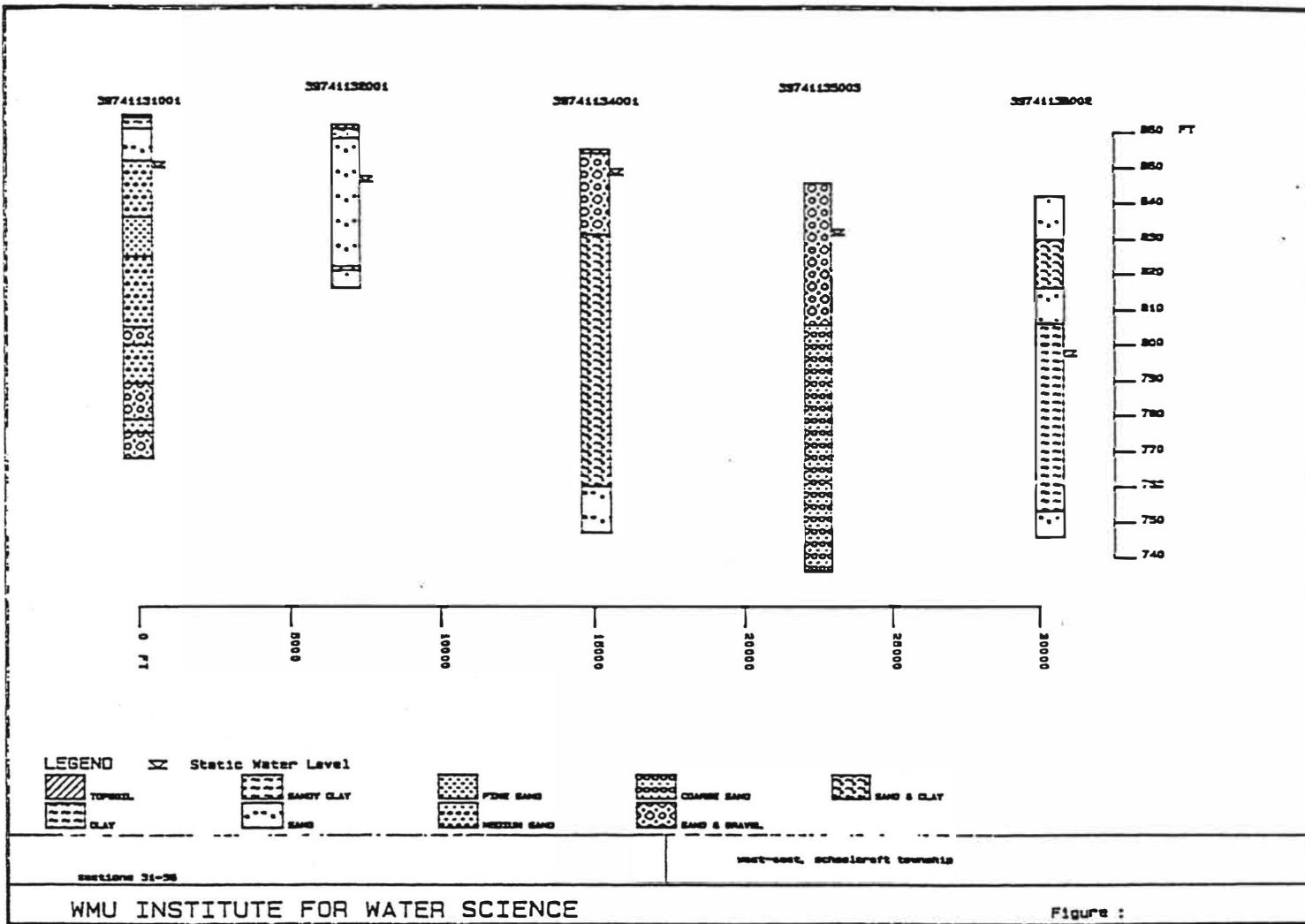
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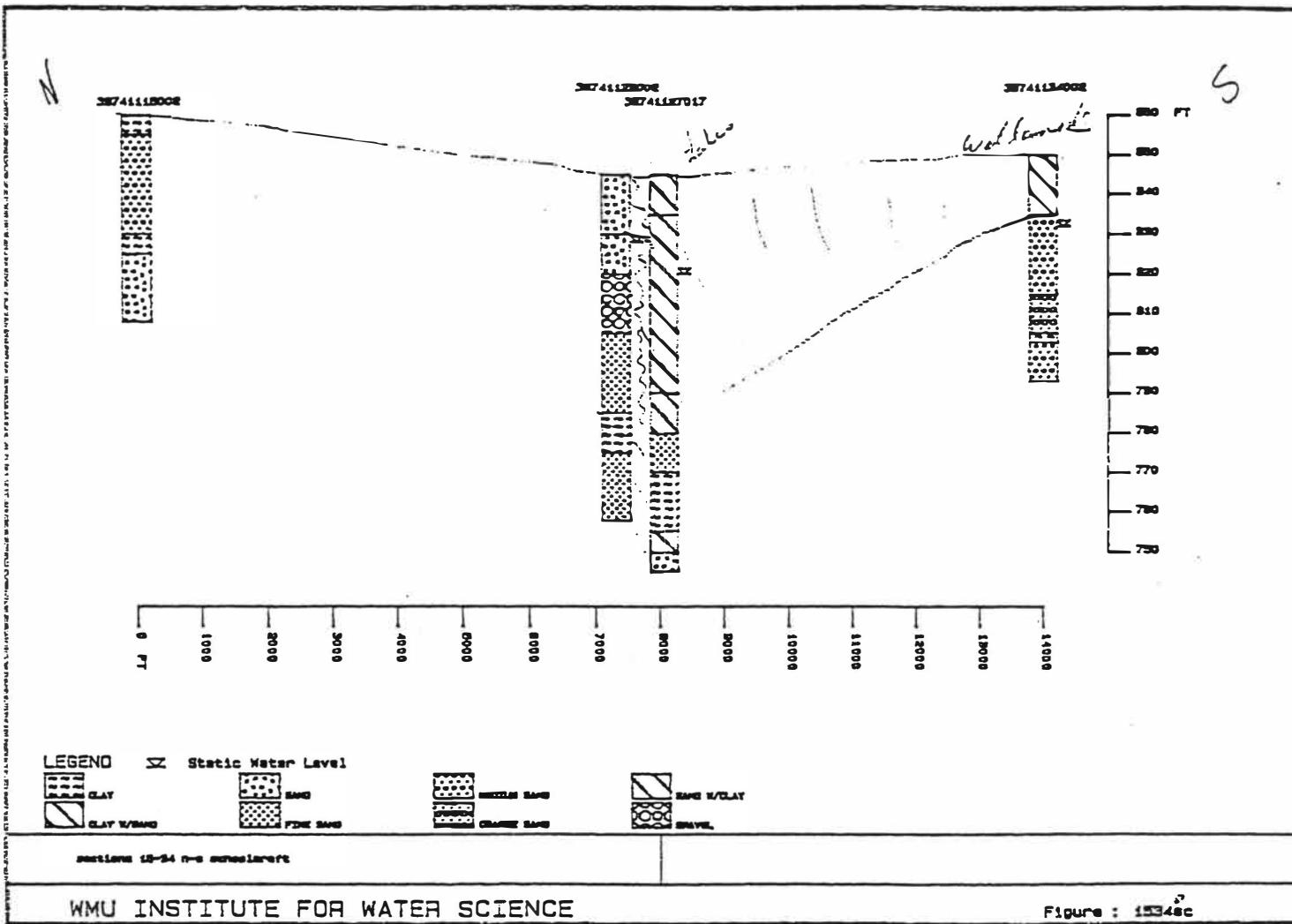
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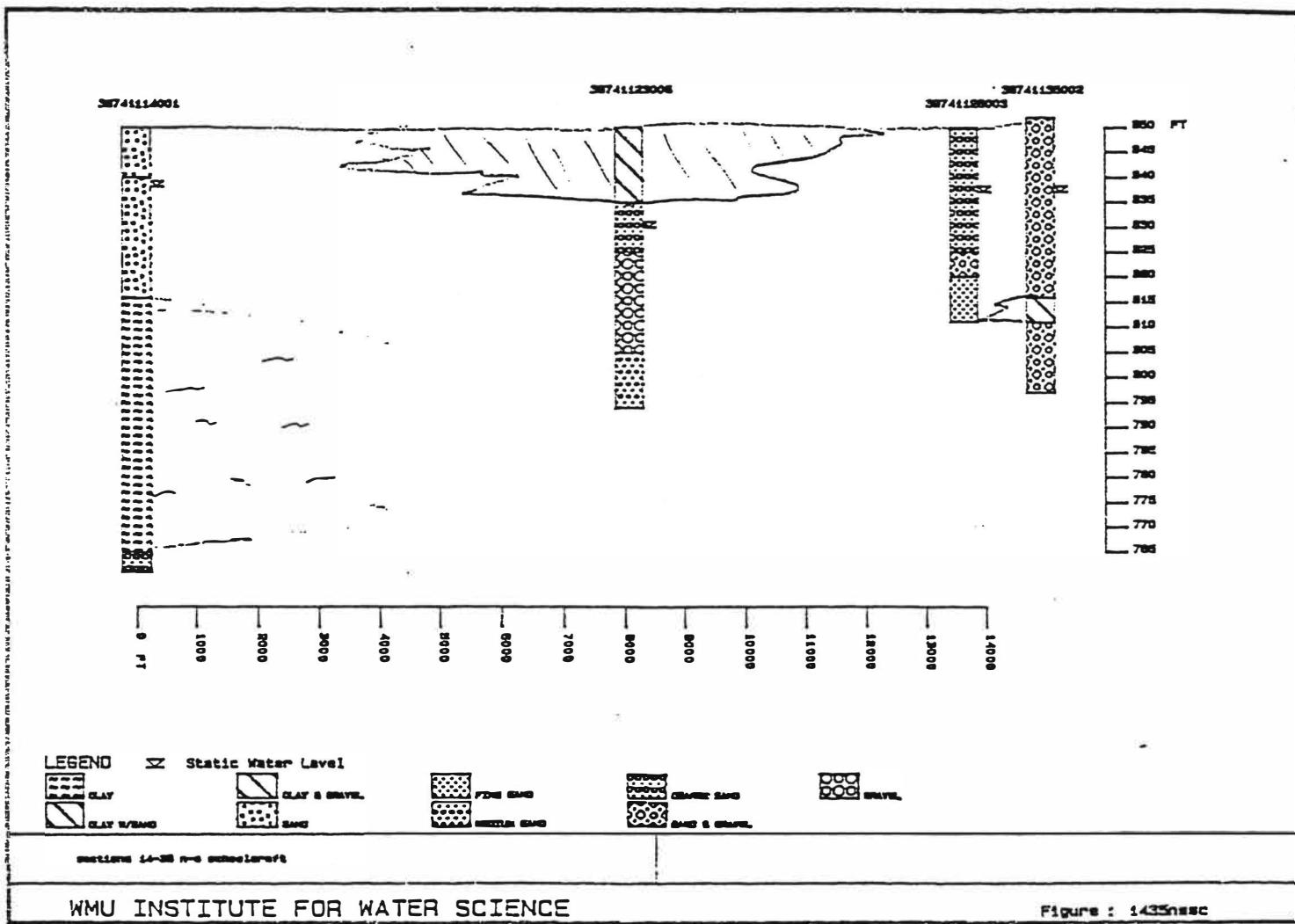


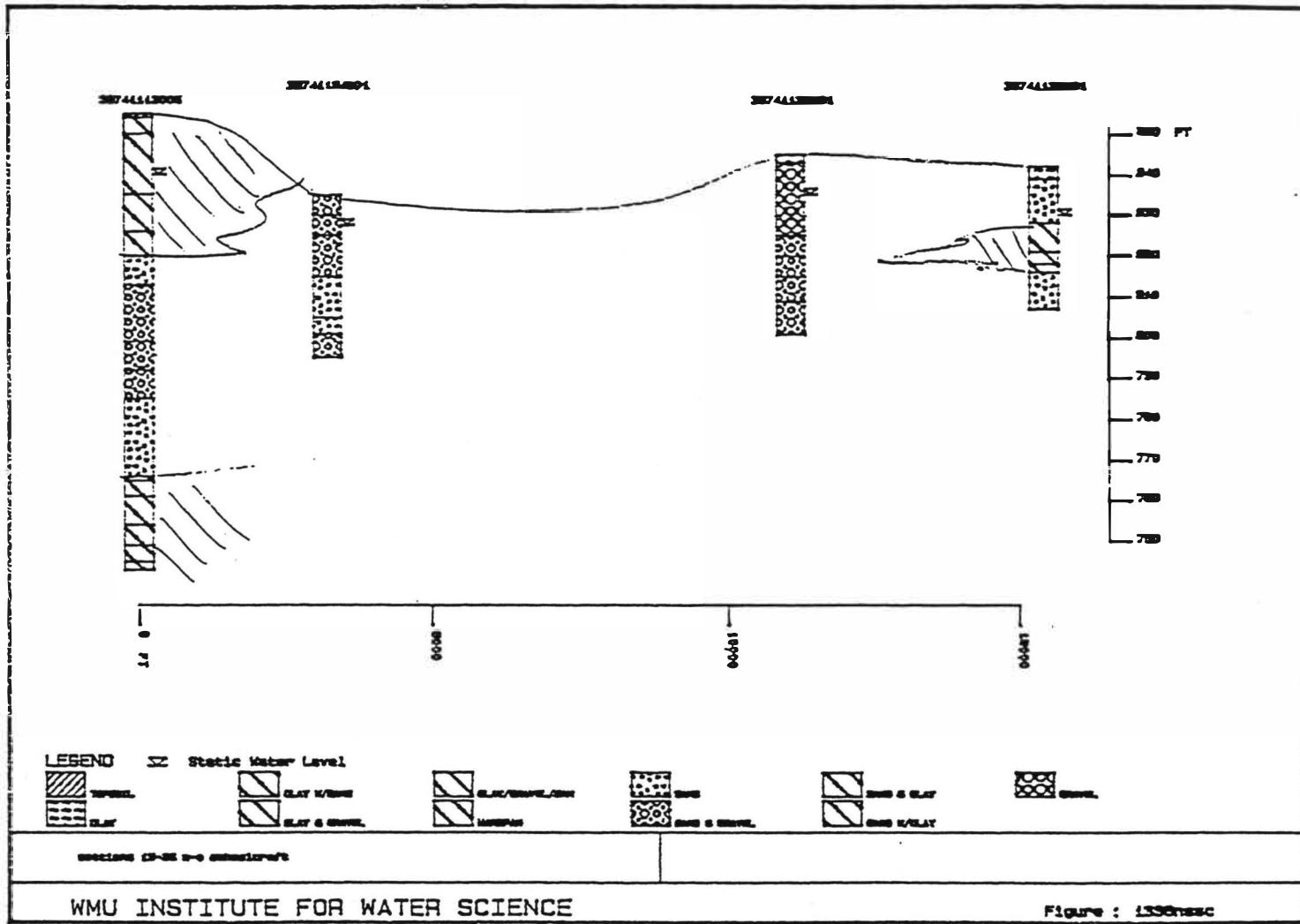


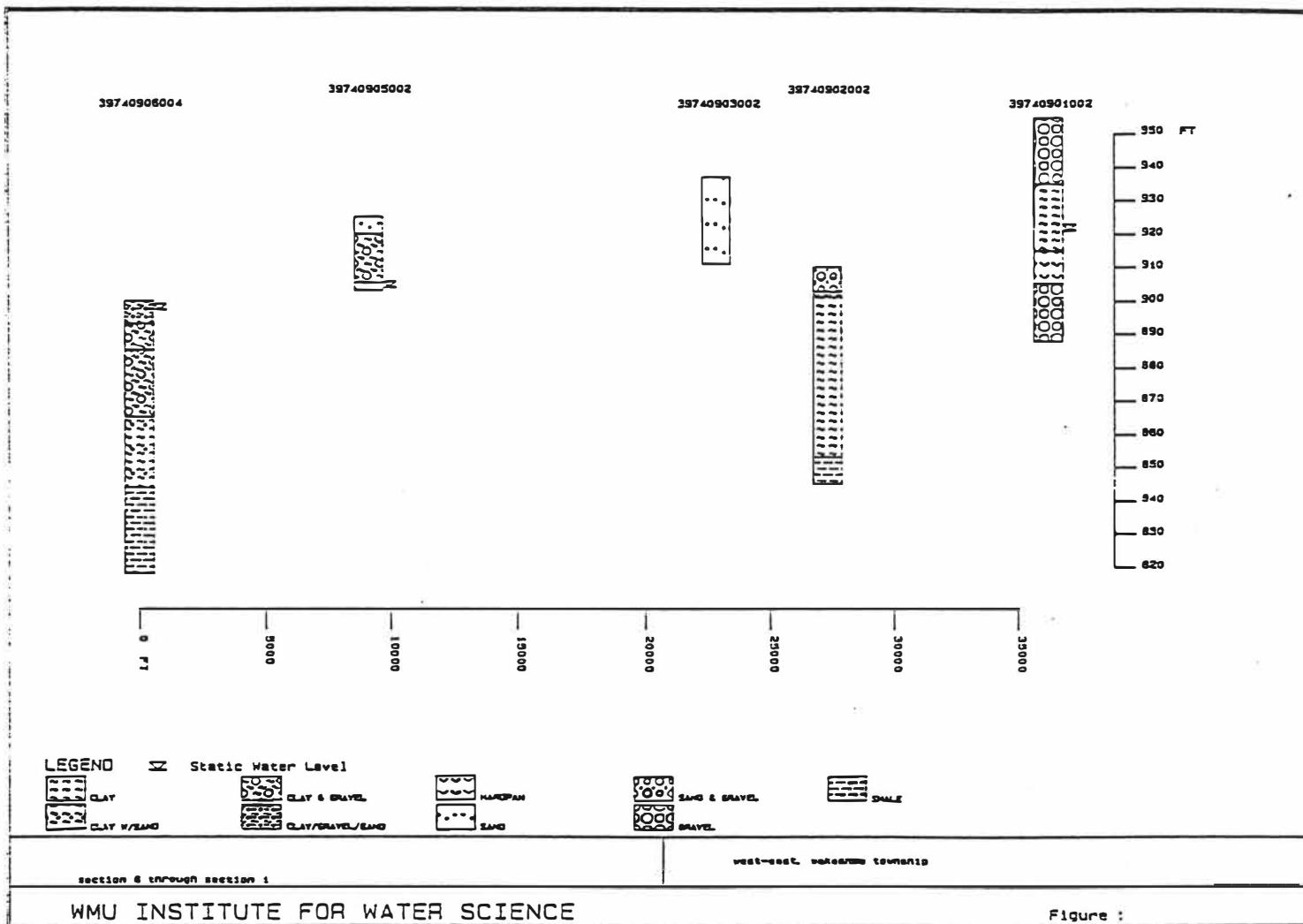


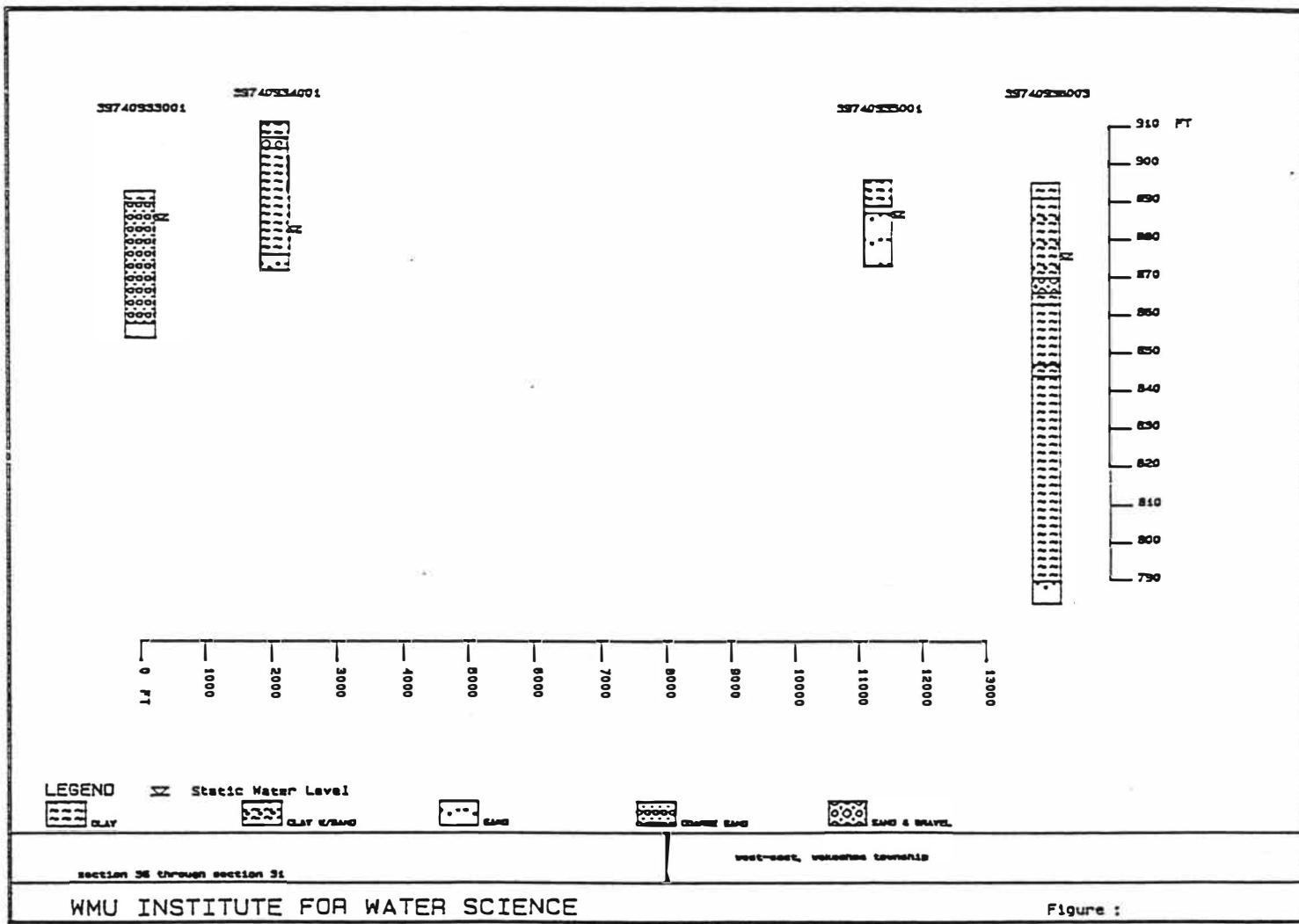


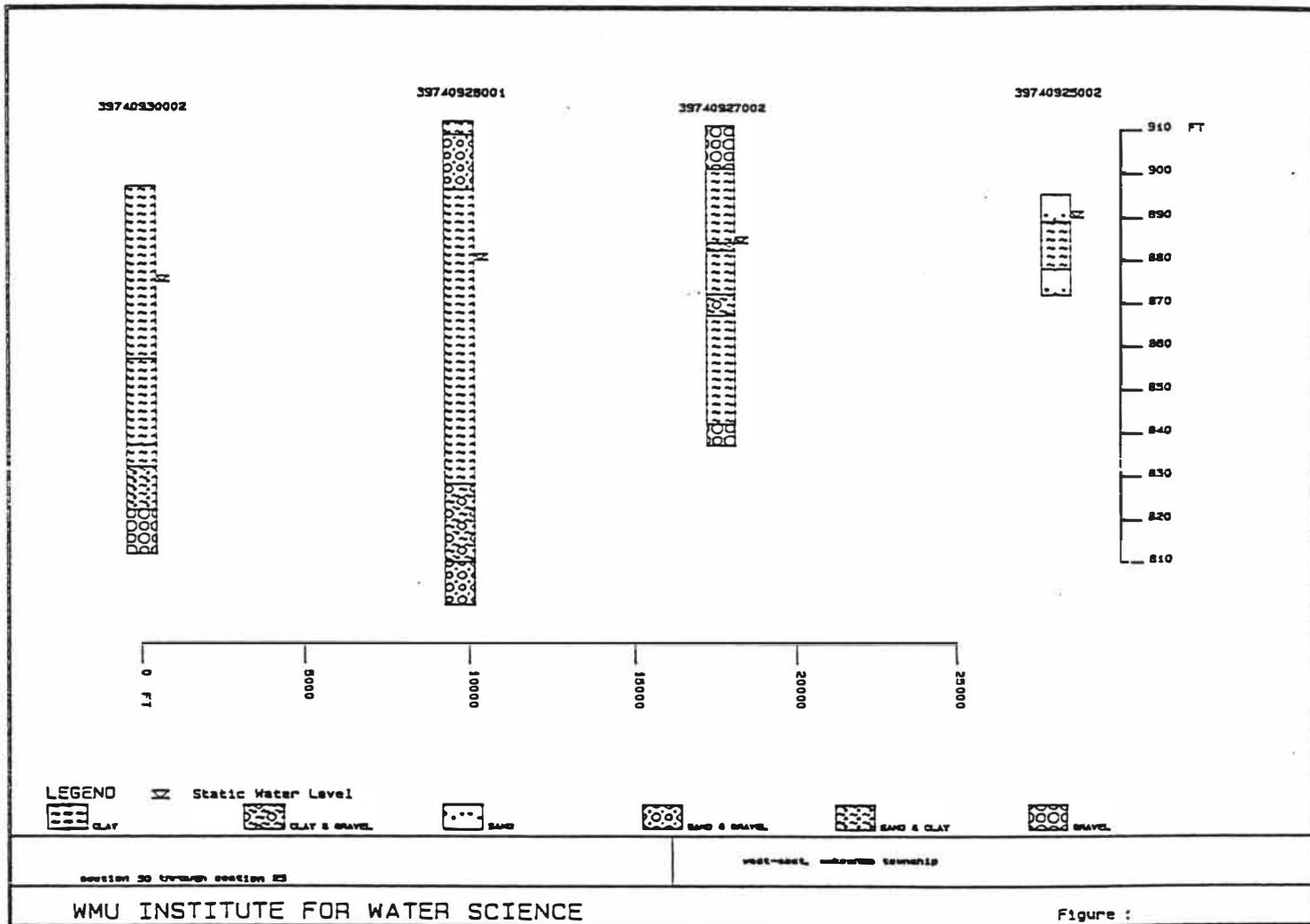


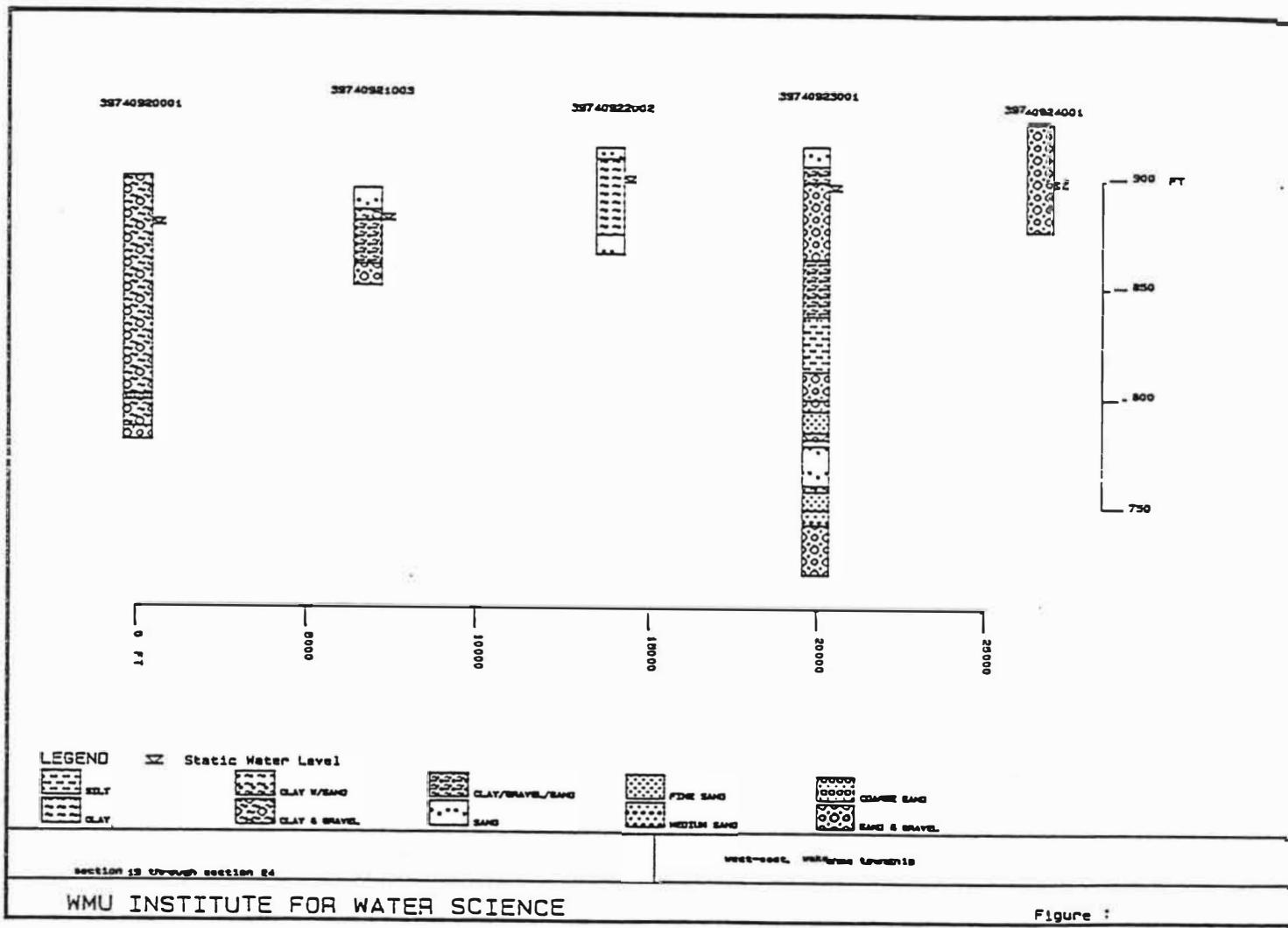


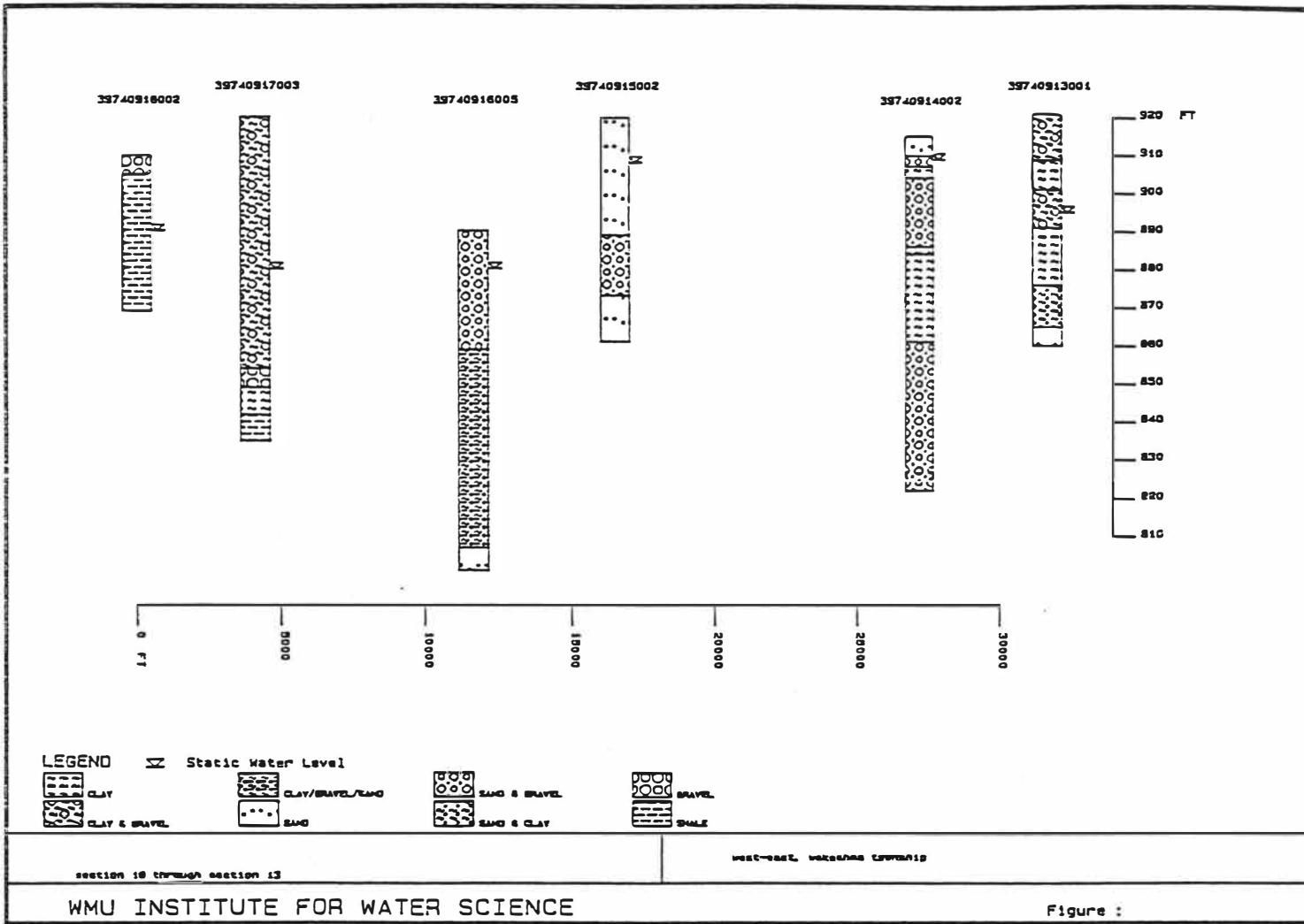


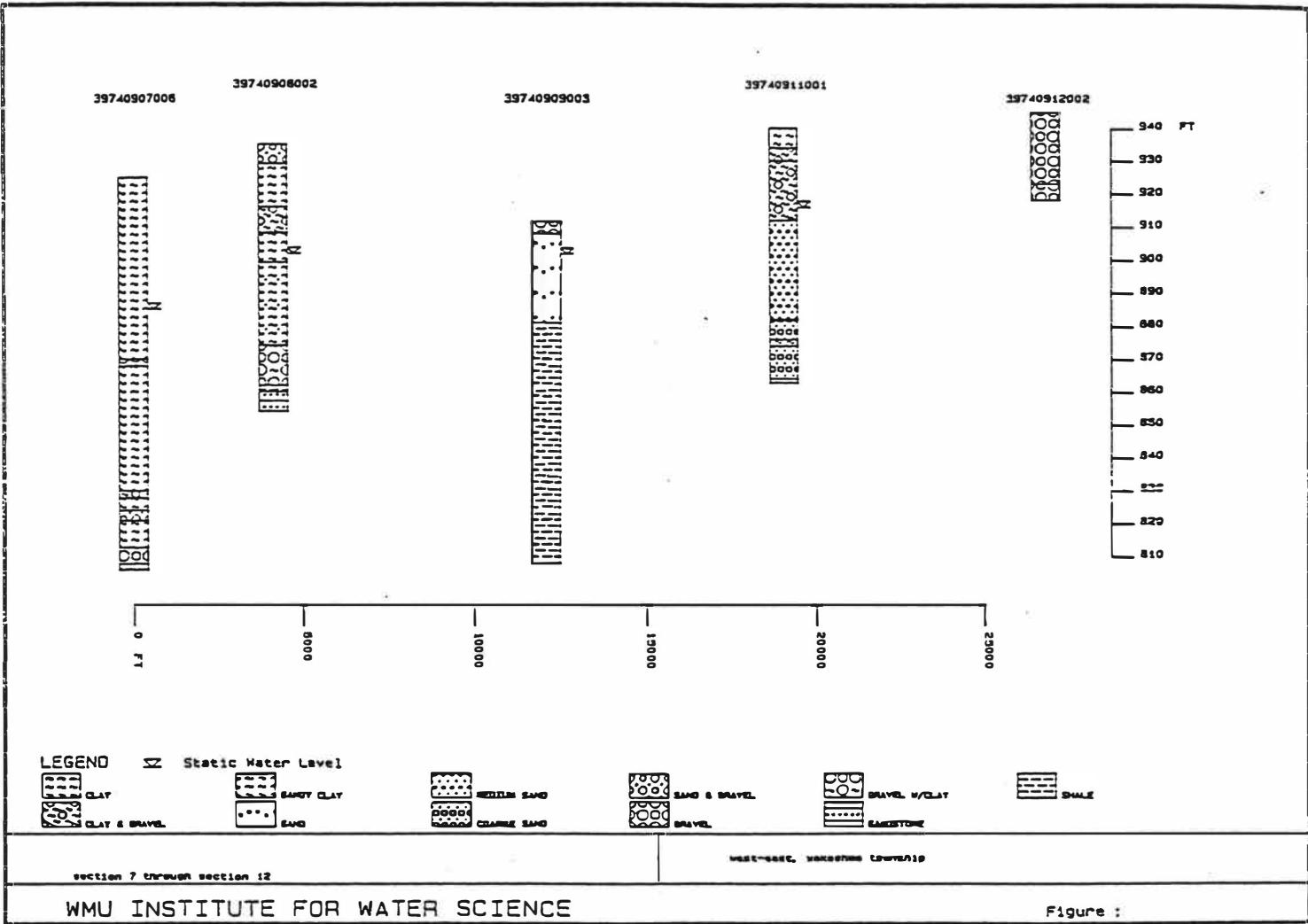










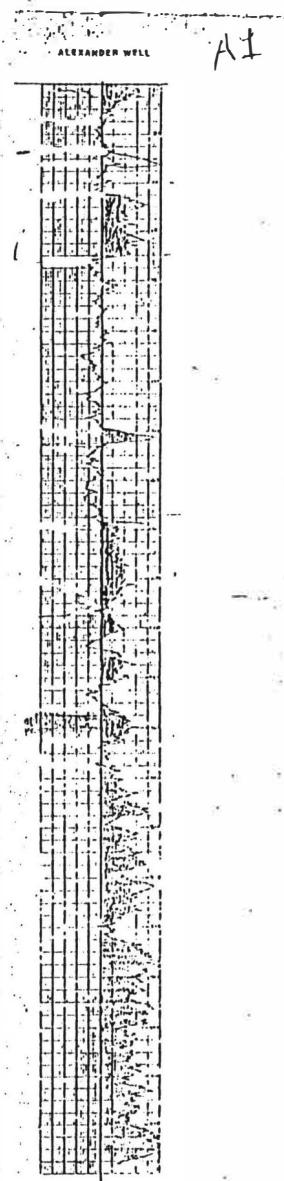


Appendix B
Water Well Records

WATER WELL AND PUMP RECORD

LOCATION OF WELL	1972022402	A-1	Page 1 of 1	Tax Parcel #			
County	EMMETT COUNTY	Landship Area	OSCEOLA				
Address		Section	20	Town	02 S	Range	12 W
Latitude and Longitude From Public Intersection 66° 1' N. of 4th St., L.E. Avenue N. of 3rd Ave. 540 S. 4th St., ALTAIR, IDAHO		OWNER OF WELL	RELENTS 220 WHEATON				
Street Address & City of Well Location		Address	121 DOWIE DR.				
Latitude with 'N' or 'S' in Section Polar		Mileage	ALTAIR, ID 83411				
		Sketch No.	Mileage: Size As Well Located: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
			10000.000000	Days	Completion Date	1/1/81	Res. 2/11
			10000.000000	ft.	6270/80		1/1/ Replacement Well
			<input checked="" type="checkbox"/> Production	<input type="checkbox"/> Recovery	<input type="checkbox"/> Drilled	<input type="checkbox"/> Auger	<input type="checkbox"/> Cored
			<input type="checkbox"/> Irrigation	<input type="checkbox"/> Type I Public	<input type="checkbox"/> Type III Public	<input type="checkbox"/> Other	<input type="checkbox"/> Residential
			<input type="checkbox"/> Residential	<input type="checkbox"/> Type II Public	<input type="checkbox"/> Residential	<input type="checkbox"/> Other	<input type="checkbox"/> Commercial
			<input type="checkbox"/> First Well	<input type="checkbox"/> Type III Public	<input type="checkbox"/> Residential	<input type="checkbox"/> Other	<input type="checkbox"/> Industrial
FORMATION DESCRIPTION		BEDCASTING	<input type="checkbox"/> Steel	<input type="checkbox"/> Threaded	<input type="checkbox"/> Weight: Above Surface	<input type="checkbox"/> Weight: Below Surface	<input type="checkbox"/> Weight: Between
		THICKNESS OF STRATA	PIPE	Plastic	Welded	1.0 ft.	0.5 ft.
SAND AND GRAVEL	12	DEPTH TO BOTTOM OF STRATA	4.00 in. to 375.0 ft. depth				
BROWN CLAY AND GRAVEL	8		3.00 in. to 165.0 ft. depth				
GRAY CLAY AND GRAVEL	17		Created with Hole Driller				
SAND AND GRAVEL WITH CLAY SERIES	81		0.00 in. to 0.0 ft. depth				
GRAVEL AND SEDGES	55		0.00 in. to 0.0 ft. depth				
GRAY CLAY AND GRAVEL SERIES	26						
STONES AND GRAY CLAY	22						
GRAY CLAY	11						
GRAY CLAY AND GRAVEL	31						
SAND, GRAVEL AND GRAY CLAY	9						
GRAY CLAY AND GRAVEL	121						
GRAVEL	6						
15. Records, elevation, source of data, etc.		1. STATIC WATER LEVEL:	104.50	ft. below land surface	<input type="checkbox"/> Elliptical	<input type="checkbox"/> Elliptical	<input type="checkbox"/> Elliptical
		2. HORIZONTAL DRAINS: before land surface	192.0	ft. after 12.0 ft. trapping at	12.0 ft. R.		
		3.1	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.2	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.3	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.4	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.5	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.6	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.7	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.8	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.9	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.10	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.11	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.12	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.13	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.14	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.15	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.16	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.17	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.18	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.19	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.20	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.21	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.22	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.23	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.24	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.25	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.26	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.27	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.28	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.29	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.30	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.31	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.32	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.33	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.34	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.35	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.36	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.37	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.38	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.39	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.40	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.41	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.42	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.43	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.44	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.45	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.46	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.47	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.48	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.49	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.50	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.51	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.52	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.53	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.54	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.55	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.56	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.57	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.58	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.59	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.60	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.61	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.62	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.63	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.64	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.65	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.66	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.67	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.68	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.69	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.70	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.71	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.72	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.73	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.74	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.75	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.76	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.77	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.78	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.79	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.80	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.81	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.82	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.83	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.84	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.85	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.86	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.87	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.88	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.89	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.90	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.91	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.92	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.93	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.94	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.95	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.96	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.97	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.98	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		3.99	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.00	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.01	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.02	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.03	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.04	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.05	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.06	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.07	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.08	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.09	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.10	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.11	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.12	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.13	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.14	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.15	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.16	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.17	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.18	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.19	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.20	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.21	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.22	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.23	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.24	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.25	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.26	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.27	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.28	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.29	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.30	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.31	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.32	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.33	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.34	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.35	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.36	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.37	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.38	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.39	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.40	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.41	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.42	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.43	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.44	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.45	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.46	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.47	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.48	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.49	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.50	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.51	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.52	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.53	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.54	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.55	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.56	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.57	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.58	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.59	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.60	192.0	ft. after 0.0 ft. trapping at	0.0 ft. R.		
		4.61	192				

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WATER WELL AND PUMP RECORD

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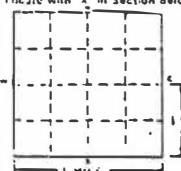
A.2

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
GEOPHYSICAL SURVEY NO 81-16 (first page of two) A3 WATER WELL AND PUMP RECORD PERMIT NUMBER

1 LOCATION OF WELL		Section Number	Town Number	Range Number
County KALAMAZOO	Township Name KALAMAZOO	E	SE 1/4 SH 1/4	22 2 S N/S 11 W/E/W
Latitude And Direction From Road Intersection # 16 02S. Burdick St. 1 5.5' West of Burdick St. curb and 1 ft. South of Dalch St.				
Street Address & City of Well Location 1 mile west of Section Line		Sketch Map		
2 FORMATION DESCRIPTION				
Sand, gravel and clay	3	3		
Mud and clay	6	9		
Marl and clay	3	12		
Gravel, sand and clay	4	16		
Sand, gravel and clay	5	21		
Sand, gravel and clay	7 1/2	20		
Clay and fine sand	8	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 1/4	54		
Sand, gravel and clay	5	59		
Sand, gravel and clay	5	64		
Sand, gravel and clay	5	69		
Sand, gravel and clay	5 2/3	74		
Gravel, sand and clay	5	79		
Gravel, sand and clay	5 1/2	84		
Gravel, sand and clay (muddy)	5	99		
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 3/4	119		
Gravel, sand and clay	5	124		
Gravel sand and clay	5	129		
Gravel, sand and clay	5 1/2	133		
Fine sand and clay	4	137		
Fine sand and clay	5	142		
Fine sand and clay	5	147		
16. Remarks, elevation, source of data, etc. (cont. on page 2) Used one bag of Jell pellets at 6 2-6 9 ft level. Used 2 bags of ready cement mix at surface				
16. WATER WELL CONSTRUCTION CERTIFICATION This well was drilled under my supervision and this report is true to the best of my knowledge and belief				
CITY OF KALAMAZOO 071 2				
REGISTERED BUSINESS NAME 071 2 Address 415 Stockbridge Ave., MI 49001 Signed _____ Date 07/08/82 REPRESENTATIVE _____				

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
WATER WELL AND PUMP RECORD

PART 127 ACT 108 PA 1478

GEODESICAL SURVEY NO <i>81-16 A3</i>		DATE <i>June 59</i>		TIME <i>10:00 AM</i>	
LOCATION OF WELL		SECTION NUMBER <i>1/4</i>		TOWNSHIP NUMBER <i>N/S</i>	
COUNTY <i>Wayne</i>		TOWNSHIP NAME <i>Redford</i>		RANGE NUMBER <i>E/W</i>	
DISTANCE AND DIRECTION FROM ROAD INTERSECTION <i>(1)</i>					
STREET ADDRESS & CITY OF WELL LOCATION Indicate with "A" in Section below Sketch Map					
					
FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH IN FEET FROM SURFACE		
Fine sand and clay		5	152		
Fine sand and gaxy 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 1/2	176		
Blue clay		10	177		
PLUMBING LEVEL					
It before ____ hrs pumping at ____ G.P.M.					
It after ____ hrs pumping at ____ G.P.M.					
WELL HEAD CONNECTION					
<input type="checkbox"/> Inlets adapter <input type="checkbox"/> 12" sleeve drain					
<input type="checkbox"/> Basement offset <input type="checkbox"/> Anchored fit					
WELL GROUTED?					
<input type="checkbox"/> No <input type="checkbox"/> Yes from ____ to ____ ft					
<input type="checkbox"/> Mortar <input type="checkbox"/> Bitonite <input type="checkbox"/> Other _____					
# of bags of cement _____ Address _____					
Nearest source of private contamination					
Type _____ Distance _____ It Direction _____					
Well unfiltered upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No					
PUMP <input type="checkbox"/> Not installed <input type="checkbox"/> Pump insulation only					

WATER WELL AND PUMP RECORD

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This is not a legal document.

WATER WELL AND PUMP RECORD

1. LOCATION OF WELL	1071004001	A5	Tax Parcel
County	KALAMAZOO	Ownership Type	Private
		Fraction	RF 1/4 NW 1/4 SW 1/4
		Section	04
		Town	21 S
		Precinct	10 N
Address And Direction From Road Intersection 25 MI. N. OF 220TH ST., 100 FT. S. OF 9H AVE. 5200 E. 9H AVE., KALAMAZOO 49001			
Street Address & City of Well Location			
Locate with 'X' in Section Below		Sketch Map	
ELEVATION 670.00 ssf			
2. FORMATION DESCRIPTION			
Thickness of Stratum	Depth To Bottom of Stratum	Bottom of Stratum	Top of Stratum
SAND & GRAVEL	24	24	
GRAVEL & CLAY	25	47	
CLAY	2	51	
COARSE SAND	9	60	
3. Casing			
Type	Steel	Threaded	Height Above Surface
Material	Steel	Welded	Surface 1.0 ft.
Outer	4.00 in. to 36.0 ft. depth	Length	ft./ft.
	3.00 in. to 19.0 ft. depth		
Grade Drill Hole Diameter		Borehole (ft.)	
	0.50 in. to 8.0 ft. depth		
	0.00 in. to 0.0 ft. depth		
4. Screen			
Type	Stainless Steel	Length	ft.
Size	0.010	Length	0.0
Set between	56.00 ft. and 67.00 ft.	Bottom	ft.
11710002	11710002	Head	ft.
		Presser Check	
		Uplift above screen	ft.
		other	
5. Static Water Level			
6.00	ft. below land surface	Flow	
6. Pumping Test			
16. Drawn	0.5 hrs. pumping at	59 G.P.M.	
17. Drawn	0.0 hrs. pumping at	0 G.P.M.	
7. Well Head			
Completion:	112 ft. above grade	112 ft. above grade	
	112 ft. above ground	112 ft. above ground	
18. Well Casing	112 ft. to 116 ft.	112 ft. to 116 ft.	
	116 ft. to 118 ft.	116 ft. to 118 ft.	
No. of Bars of Cement	Additives		
19. Nearest source of possible contamination			
Type	Soil	Distance	50 ft.
	Soil	Direction	S
Well disturbed upon completion?	Yes	1 Yes	1 No
Was old well plugged?	Yes	1 Yes	1 No
20. Pump			
11. Pump installed	112 ft. above grade	112 ft. above grade	
Pump manufacturer	Others	Others	
Model number	00-5	00-5	
Length of pump pipe	12 ft.	Capacity	0 G.P.M.
Type	InSubmersible	InSubmersible	
Impressions			
Manufacturer's name			
0.00 meter capacity	0 gallons		
21. Other Information			
This well was built under my jurisdiction and this report is true to the best of my knowledge and belief.			
REGISTRATION BUSINESS NAME			
REGISTRATION REG. NO.			
Address			
City			
State			
AUTHORIZED REPRESENTATIVE			
Title			

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Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

None

AUTHORIZED REPRESENTATIVE

Title

WATER WELL AND PUMP RECORD

Page 1 of 1

LOCATION OF WELL	1071003001	A6	Fit Panel		
County	Wayne	Section	SW 1/4	SW 1/4	SW 1/4
Address	101245 200	AVAILABILITY	03	03	03
Distance And Direction From Road Intersection 50 FT. N. OF N. END, 50 FT. E. OF S. 10TH ST. 8247 E. 9 MILE, MIAMI LANE, MIAMI					
Street Address & City of Well Location					
Locate with 'T' in Section Below	Sketch Map				
<p>EL ELEVATION 861.00 ft.s</p>					
2 FORMATION DESCRIPTION		THICKNESS OF SECTION	DEPTH TO BOTTOM OF SECTION	10	
RED CLAY LOMB		8	8	2,00 in. to 40.0 ft. depth	
WHITE GROUT		24	32	6,00 in. to 0.0 ft. depth	
WHITE CLAY		21	54	Control Drill Hole Parameter	
YELLOW CLAY		1	54	0.00 in. to 0.0 ft. depth	
PINE CLAY FIRE SAND		9	61	0.00 in. to 0.0 ft. depth	
ZEPHY FIRE SAND		5	61	0.00 in. to 0.0 ft. depth	
RED. SAND		5	71	3. STATIC WATER LEVEL:	
				0.50 ft. below land surface	
10 HYDROIC LEVEL: Below land surface					
1.0 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 DEPTH					
COMPLETION: Drill holes open 1 1/2" above grade					
1. Present effect 1 Dipped pit					
12 WELL NUMBER					
1. Drill no. 1 1/2" from top 0 ft.					
1. Drill no. 1 1/2" from top					
No. of tops of control 200 ft.					
13. Last source of possible pollution					
1. Septic instance 30 ft. direction N					
2. Dislocated open completion's filter 1 1/2"					
3. Old well plug 32 1. No. 1 No.					
14. PUMP: 1. Drill installed 1 pump installation only					
Manufacturer's name GOMOS					
Model number 4P 1/2" 100 ft.					
Length of pump pipe 20 ft. capacity 0 G.P.M.					
100 ft. 1 Submersible 100 ft.					
PRESSURE TEST:					
Manufacturers name					
Model number capacity 4 gallons					
15. WATER WITHDRAWAL CERTIFICATION:					
This well was drilled and I declare that all data reported is true to the best of my knowledge and belief.					
028					
REGISTERED BUSINESS NAME			REGISTERED # NO.		
Address					
Signed			AUTHORIZED REPRESENTATIVE		
			Date		

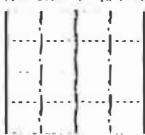
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Data Source: Michigan Groundwater Survey

17. Rig Operator's Name:

WATER WELL AND PUMP RECORD

Form 1-11

1 LOCATION OF WELL County: KALAMAZOO Address And Direction From Road Intersection: 5 MI. E. OF M-11, 100 FT S. OF E. K-22, 2028 E. N AVE., KALAMAZOO 49001 Street Address & City of Well Location:		2 SECTION 12 1/4 RR 1/4 NW 1/4 TOWNSHIP TRACTOR		3 SECTION 12 1/4 RR 1/4 NW 1/4 SECTION 02 TOWNSHIP TRACTOR		4 PARCELS 16 X PARCEL 1	
5 DEPTH WITH % IN SECTION BELOW 		Sketch Map		6 WELL DEPTHS S.D. FT. 08/19/77 100 ft. 100 ft. 100 ft. 100 ft.		7 WELLS 1) Cased 2) Unlined 3) Drilled 4) Drilled 5) Hollow 6) Open 7) Bored 8) Dug 9) Tapped 10) Replaced 11) New Well 12) Replacement Well	
8 FORMATION DESCRIPTION BROWN CLAY + SAND SAND GREEN CLAY COARSE SAND		THICKNESS OF STRATA	DEPTH TO TOP OF STRATA	DIAMETER 4.00 in. to 6.00 in. depth 0.00 in. to 0.00 in. depth drilled 0.00 in. to 0.00 in. depth 0.00 in. to 0.00 in. depth	WEIGHT OF STEEL LBS/FT. 4.00 0.00 0.00 0.00	BRIGHTNESS 1) Dark 2) Light 3) Medium 4) Bright 5) Very Bright 6) Glare 7) Surface 8) Bright 9) Dark 10) Light 11) Medium 12) Bright 13) Very Bright 14) Glare 15) Surface 16) Bright 17) Dark 18) Light 19) Medium 20) Bright 21) Very Bright 22) Glare 23) Surface 24) Bright 25) Dark 26) Light 27) Medium 28) Very Bright 29) Glare 30) Surface 31) Bright 32) Dark 33) Light 34) Medium 35) Bright 36) Very Bright 37) Glare 38) Surface 39) Bright 40) Dark 41) Light 42) Medium 43) Bright 44) Very Bright 45) Glare 46) Surface 47) Bright 48) Dark 49) Light 50) Medium 51) Bright 52) Very Bright 53) Glare 54) Surface 55) Bright 56) Dark 57) Light 58) Medium 59) Bright 60) Very Bright 61) Glare 62) Surface 63) Bright 64) Dark 65) Light 66) Medium 67) Bright 68) Very Bright 69) Glare 70) Surface 71) Bright 72) Dark 73) Light 74) Medium 75) Bright 76) Very Bright 77) Glare 78) Surface 79) Bright 80) Dark 81) Light 82) Medium 83) Bright 84) Very Bright 85) Glare 86) Surface 87) Bright 88) Dark 89) Light 90) Medium 91) Bright 92) Very Bright 93) Glare 94) Surface 95) Bright 96) Dark 97) Light 98) Medium 99) Bright 100) Very Bright 101) Glare 102) Surface 103) Bright 104) Dark 105) Light 106) Medium 107) Bright 108) Very Bright 109) Glare 110) Surface 111) Bright 112) Dark 113) Light 114) Medium 115) Bright 116) Very Bright 117) Glare 118) Surface 119) Bright 120) Dark 121) Light 122) Medium 123) Bright 124) Very Bright 125) Glare 126) Surface 127) Bright 128) Dark 129) Light 130) Medium 131) Bright 132) Very Bright 133) Glare 134) Surface 135) Bright 136) Dark 137) Light 138) Medium 139) Bright 140) Very Bright 141) Glare 142) Surface 143) Bright 144) Dark 145) Light 146) Medium 147) Bright 148) Very 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WATER WELL AND PUMP RECORD

Page 1 of

Data Source: Michigan Groundwater Survey

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

Address:

This is an MDRR computer generated facsimile of a water well record submitted under PA 108 of 1978.
This is not a legal document.

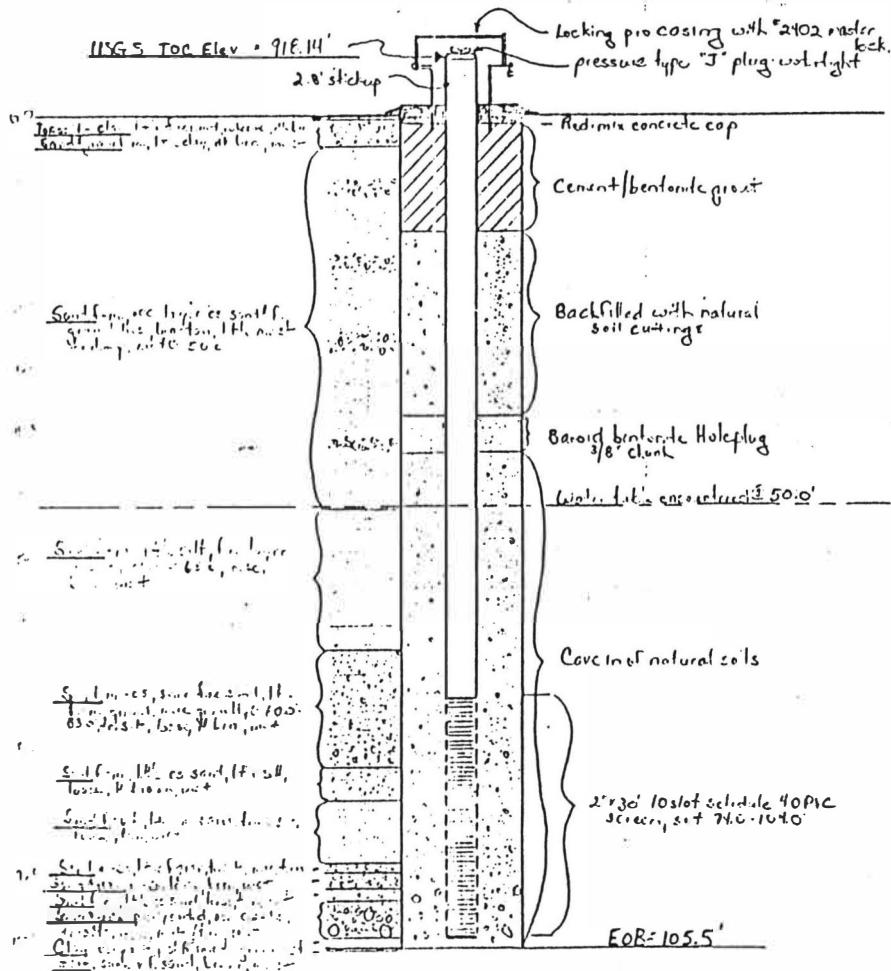
Calculation Sheet

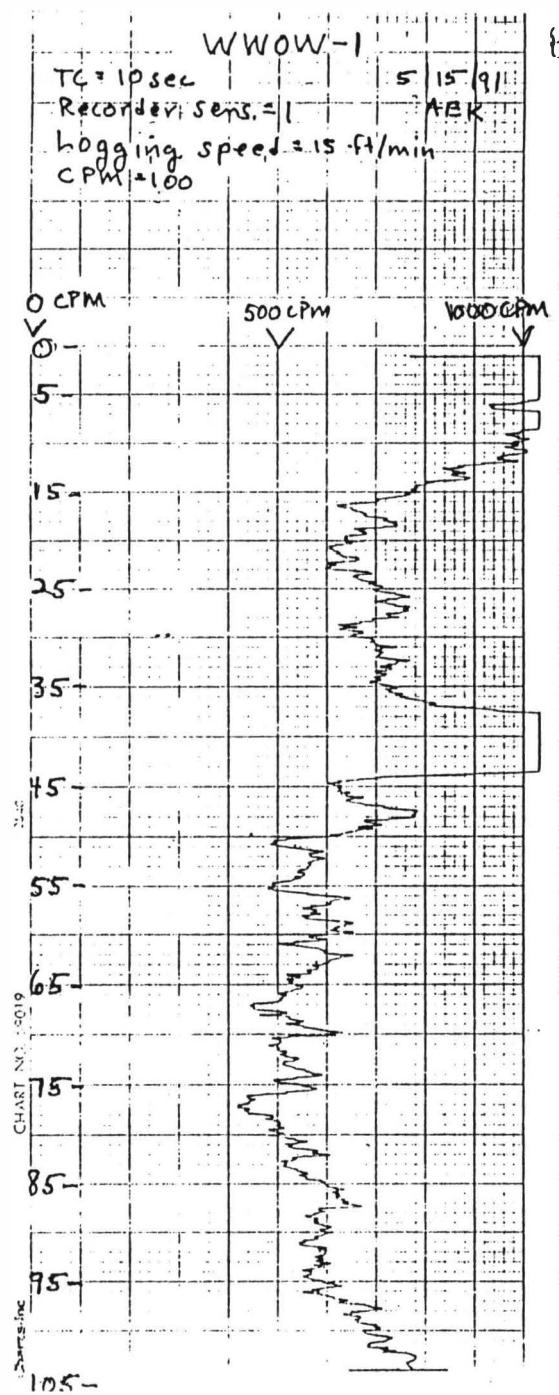
BY

18

Computed by C. S. Miller
Checked by _____

Subject Wkday - Diagram Sheet 1 of 1
Wkday and wifitg Job No. 01397
Client City of Portage Date 4/15/91





WATER WELL AND PUMP RECORD

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WATER WELL AND PUMP RECORD

Page 1 of 2

LOCATION OF WELL	3971101000	B3	Tax Parcel			
County	KALAMAZOO	Township Name TOPPIAGE	Fraction NW 1/4 NE 1/4 NE 1/4	Section 01	Town 03 S	Range 11 W
Distance And Direction From Road Intersection 1/2 S OF TRAP SHOOT RACE (BROOKER)			OWNER OF WELL CITY UTILITIES Address 615 STOCKPILE KALAMAZOO, MI 49001			
Street Address & City of Well Location			Address Same As Well location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Locate with 'X' in Section Below		Sketch Map		WELL DEPTH: 220.0 FT.	Date Completed 11/20/73	New Well Replacement Well
				<input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary	<input checked="" type="checkbox"/> Driven <input type="checkbox"/> Dug	
				<input checked="" type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored	<input checked="" type="checkbox"/> Jetted	
				USE Domestic Irrigation Garage Well	Type Public Residential Public	Type III Public Boat Pump
				CASING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> 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	Weight lbs/ft.	Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
				Ground Drill Hole Diameter 0.00 in. to 0.0 ft. depth 0.00 in. to 0.0 ft. depth		
				SCREEN: <input checked="" type="checkbox"/> Not Installed Type Unknown Diameter 0.00 Open 0.000 Length 0.0 Set between 0.00 ft. and 0.00 ft.		
				FITTINGS: <input checked="" type="checkbox"/> 1x-facer <input type="checkbox"/> Threaded Facer <input type="checkbox"/> Threaded Check <input checked="" type="checkbox"/> Blank above screen 0.0 ft. Other		
				STATIC WATER LEVEL: 0.00 ft. below land surface	Flow <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
				WORKING 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: <input checked="" type="checkbox"/> Pitless adapter <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit		
				WELL CORED? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes From to ft. 1 ft. of bentonite <input type="checkbox"/> Other No. of bags of cement _____ Additives _____		
				Nearest source of possible contamination Type Unknown Distance 0 ft. Direction Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
				PUMP: <input checked="" type="checkbox"/> Instl. installed <input type="checkbox"/> Pump installation only Manufacturer's name _____ Model number RP Valves Length of Draw pipe 0 ft. capacity 0 G.P.M. Type: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Jet		
				PRESSURE TANK: Manufacturer's name _____ Model number Capacity 0 Gallons		
15. Remarks, elevation, source of data, etc.		16. WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.				
Data Source: Michigan Groundwater Survey		REGISTERED BUSINESS NAME			REGISTRATION NO.	
17. Rig Operator's Name:		Address				
		Signed			AUTHORIZED REPRESENTATIVE	
					Date	

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This is not a legal document.

WATER WELL AND PUMP RECORD

Page 2 of 2

LOCATION OF WELL		39711001000	B3	page 2 of 2	
County	KALAMAZOO	Township Name	PORTAGE	Tax Parcel #	
Distance And Direction From Road Intersection #121 S OF TRAP SHOT PAVE (THROUGH)				Fraction	
				NE 1/4	NE 1/4
Street Address & City of Well Location				Section	1000
Locate with 'X' in Section Below				01	03 S
					Range
					W N
				CITY UTILITIES	
				Address 415 STEPHENSON KALAMAZOO, MI 49001	
				Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
				4 WELL DEPTHS: 220.0 ft. Date Completed 11/20/00 New Well Replacement Well	
				<input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Hollow rod	<input type="checkbox"/> Rotary <input checked="" type="checkbox"/> Auger/Mixed <input type="checkbox"/> Jetted
				6 USE: <input type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input checked="" type="checkbox"/> Test Well <input type="checkbox"/> Type IIb Public	<input type="checkbox"/> Real Corp
				7 CASING: <input type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded	Height: Above Surface 0.0 ft.
				Diameter: 7.00 in. to 8.0 ft. depth 0.93 in. to 8.0 ft. depth Ground Drill Hole Diameter: 0.00 in. to 8.0 ft. depth 8.00 in. to 8.0 ft. depth	Weight: lbs/ft.
				217 Drive Shoe <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	Drive Shoe <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
				8 SCREEN: <input type="checkbox"/> Not Installed Type Unknown <input type="checkbox"/> Diameter 0.00 Dish 0.008 <input type="checkbox"/> Length 0.0 Set between 0.00 ft. and 0.00 ft.	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
				FITTINGS: <input type="checkbox"/> 1x-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Breather Check <input type="checkbox"/> Blank above screen 0.0 ft. Other	<input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
				9 STATIC WATER LEVEL: 0.00 ft. below land surface <input type="checkbox"/> 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: <input type="checkbox"/> Bit less adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Improved pit	
				12 WELL CEMENTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From to ft. 1 bag cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement: <input type="checkbox"/> Additives	
				13 Nearest source of possible contamination Type Unknown Distance 0 ft. Direction Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Was old well plugged?	
				14 PUMP: <input type="checkbox"/> Not installed <input checked="" type="checkbox"/> Pump Installation Only Manufacturer's name: RP Rolls Model number: 0 ft. capacity: 0 G.P.M. TYPE: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name: <input type="checkbox"/> Model number: Capacity 0 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.	
				REGISTERED BUSINESS NAME	REGISTRATION NO.
				Address	
				Signed	Date
				17. Rig Operator's Name:	

Data Source: Michigan Groundwater Survey

Data Source: Michigan Groundwater Survey

11. Big Operator's Name:

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL		39731101130	B6	Tax Parcel 1		
County	Township Name	Fraction		Section	Town	Range
KALAMAZOO	PORTAGE	NE 1/4 SW 1/4 S 1/2 N				
Distance And Direction From Road Intersection						
LEXINGTON GREEN 1, Street Address & City of Well Location						
Locate with 'X' in Section Below		Sketch Map				
ELEVATION 856.00 psf						
2 FORMATION DESCRIPTION	THICKNESS OF STRATHM	DEPTH TO POSITION OF STRATHM	7 CASING:			
10) SOIL	4	4	<input type="checkbox"/> Steel	<input type="checkbox"/> Threaded	<input type="checkbox"/> Height Above Surface 0.0 ft.	<input type="checkbox"/> Plastic
CLAY	4	8	Diameter 0.00 in. to 0.00 ft. depth	<input type="checkbox"/> Weight lbs/ft.	<input type="checkbox"/> Drive Shoe	<input type="checkbox"/> Yes
SAND	7	15	0.00 in. to 0.00 ft. depth	<input type="checkbox"/> Geotextile Drill Hole Diameter 0.00 in. to 0.00 ft. depth	<input type="checkbox"/> No	
CLAY	3	18	0.00 in. to 0.00 ft. depth	<input type="checkbox"/> Set between 0.00 ft. and 0.00 ft.	<input type="checkbox"/> Other	
SAND	9	27	0.00 in. to 0.00 ft. depth	<input type="checkbox"/> FITTINGS: [] Packer [] Head Parker [] Thread Check	<input type="checkbox"/> Blank above screen 0.0 ft.	<input type="checkbox"/> Other
CLAY & SAND	48	75		<input type="checkbox"/> Not Installed		
SAND	29	104	8 SCREEN: Type Unknown	<input type="checkbox"/> Diameter 0.00	<input type="checkbox"/> Length 0.0	
GRAVEL	11	115	0.000	<input type="checkbox"/> Set between 0.00 ft. and 0.00 ft.	<input type="checkbox"/> Other	
VERT SANDY CLAY	17	112	0 fl. after 0.0 hrs. pumping at 0 G.P.M.	<input type="checkbox"/> Other	<input type="checkbox"/> Blank above screen 0.0 ft.	
SAND AND GRAVEL	48	180	0 fl. after 0.0 hrs. pumping at 0 G.P.M.	<input type="checkbox"/> 11) WELL HEAD CONNECTION: [] Pitless adapter	<input type="checkbox"/> [] 12" above grade	
CLAY AND SAND	10	190		<input type="checkbox"/> Basement offset	<input type="checkbox"/> Approved pit	
12) WELL GROUTED? <input type="checkbox"/> No <input type="checkbox"/> Yes From To ft. <input type="checkbox"/> Neutral cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement Additives						
13) PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump installation only Manufacturer's name _____ Model number RP Volts _____ Length of Pump Pipe 0 ft. capacity 0 G.P.M. TYPE: [] Submersible [] Jet						
14) PRESSURE TANK: Manufacturer's name _____ Model number _____ Capacity 0 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.						
Data Source: Michigan Groundwater Survey				REGISTERED BUSINESS NAME _____ REGISTRATION NO. _____		
17. Big Operator's Name:				Address _____		
Signed _____				AUTHORIZED REPRESENTATIVE _____ Date _____		

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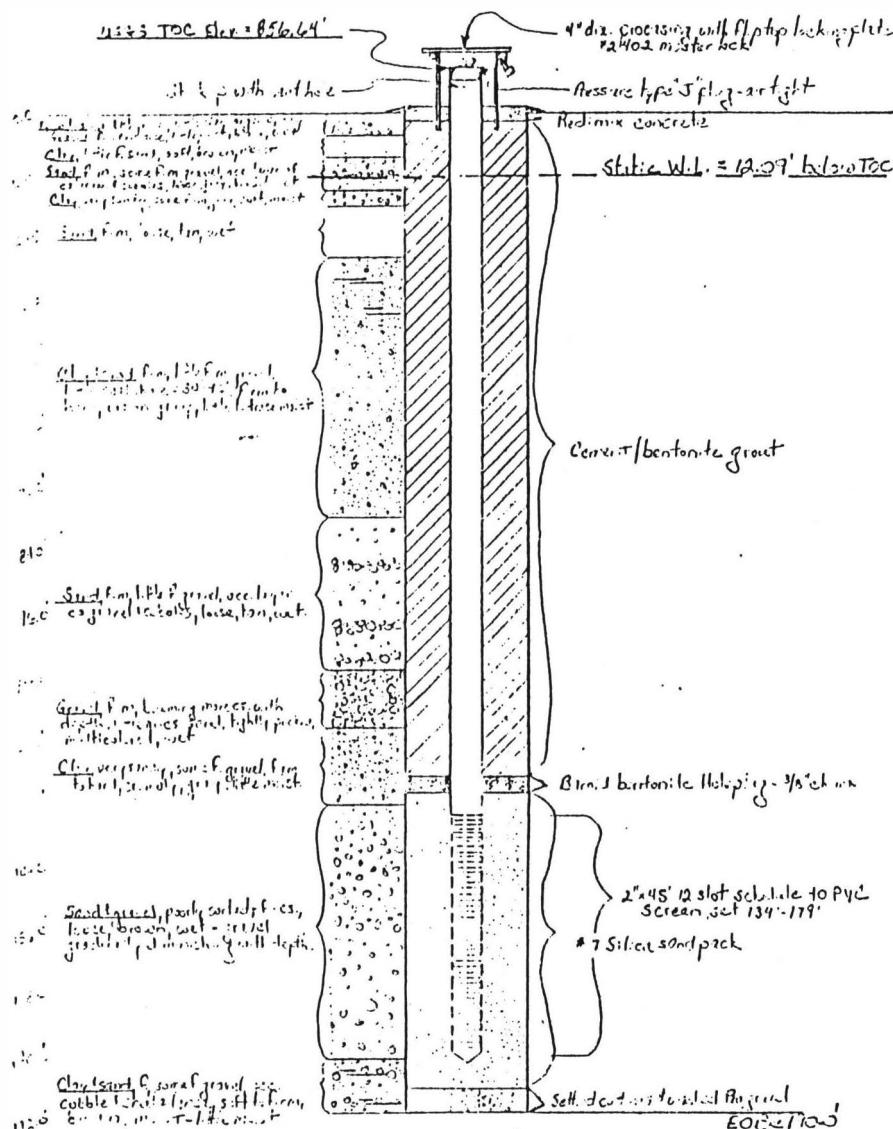


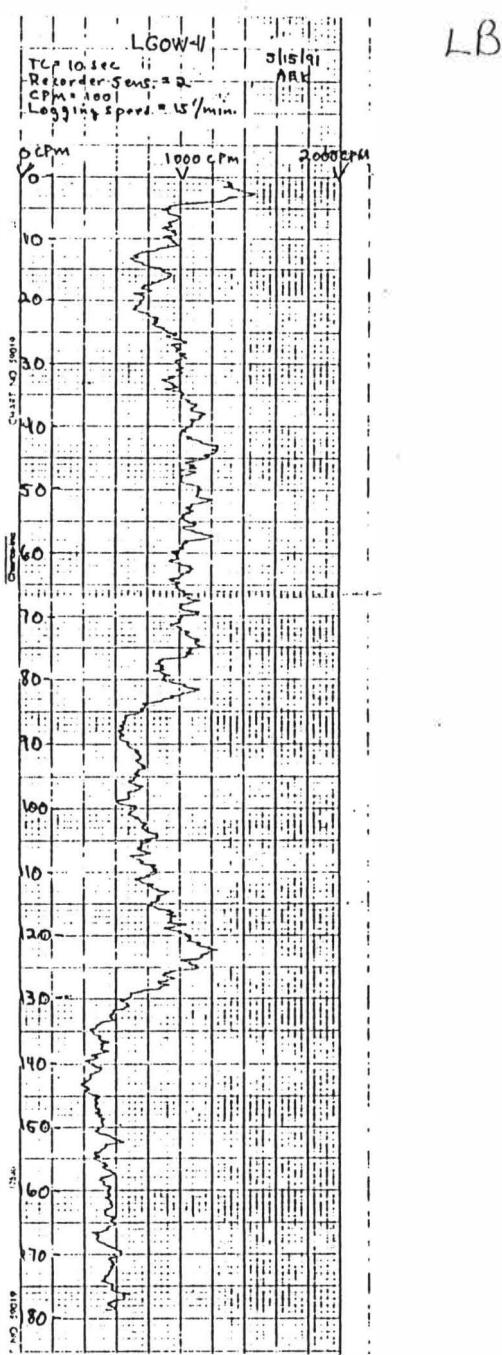
Compiled by C.S. —
Checked by _____

Calculation Sheet

B 4

Subject Lic. #13511 Sheet 1 of 1
Lexington Firecl. Job No. 31597
Client 1st Partizan Date 5/3/91





WATER WELL AND PUMP RECORD

Location of Well		1971010001	85	Part 1 of 1		Top Parcel I	
County	BALTIMORE	Township Name	PAVILLION	Section	18	Twp	03 S
Distance And Direction From Road Intersection		NW 1/4 NE 1/4 SW 1/4		Range	10 W		
5 MI. S. OF P AVE., 22 MI W. OF 25TH ST. 1529 S. 25TH ST., BALTIMORE 49001		Address		NUGGET CONST. CO. 7528 S. 25TH ST. BALTIMORE, MI 49001			
Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							
Street Address & City of Well location		Sketch Map		WELL NUMBER:		Date Completed	New Well
				90-0 FT.		08/01/77	Replacement Well
Locate with 'X' in Section Below				<input checked="" type="checkbox"/> Cable tool	Percary	Driven	<input type="checkbox"/> 1 Day
				<input type="checkbox"/> Hollow rod	Auger/Bored	Drilled	
				<input checked="" type="checkbox"/> BSE	<input checked="" type="checkbox"/> Domestic	Type Public	Type III Public
					Irrigation	Type II Public	Local Pump
					Test Well	Type I Public	
ELEVATION 866.00 msL				<input checked="" type="checkbox"/> CASING:	Steel	Threaded	Height Above Surface 1.0 ft.
2 FORMATION DESCRIPTION		THICKNESS OF STRATH	DEPTH TO POINT OF STRATHS	<input type="checkbox"/> Plastic	<input checked="" type="checkbox"/> Welded		Weight lbs/ft.
SAND GRAVEL		30	0	4.00 in. to 85.00 ft. depth			
SAND		10	10	4.00 in. to 0.0 ft. depth			
BARE CLAY		31	71	Grouted Drill Hole Diameter			
FINE SAND		6	76	4.00 in. to 0.0 ft. depth			
WATER SAND		14	90	4.00 in. to 0.0 ft. depth			
ELEVATION 866.00 msL				<input checked="" type="checkbox"/> SCREEN:	Type Stainless Steel	Diameter 3.00	<input type="checkbox"/> Not Installed
				SLOT 0.010	Length 5.9		
				Set between 85.00 ft. and 90.00 ft.			
				FITTINGS: 1 1/2-Packer 1 Head Packer 1 Breather Check			
				1 Blank above screen 0.8 ft. Other			
9 STATIC WATER LEVEL:				25.90 ft. below land surface			<input checked="" type="checkbox"/> 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 ft. after 0.0 hrs. pumping at	0 G.P.M.		
11 WELL HEAD				COMPLETION: <input checked="" type="checkbox"/> Pitless adapter	12" above grade		
				<input type="checkbox"/> Bypass offset	<input checked="" type="checkbox"/> Approved pit		
12 WELL CROPPED?				<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From 0 ft.		
				<input type="checkbox"/> Head control <input type="checkbox"/> Bantamite <input type="checkbox"/> Other			
				No. of bags of cement	Additives		
13 Nearest source of possible contamination				Type Septic Distance 50 ft. Direction E			
				Well disconnected up completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
				Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
14 PUMP: <input type="checkbox"/> Not installed <input checked="" type="checkbox"/> Pump Installation Only				Manufacturer's name NITERS			
				Model number NP .5 Volts			
				Length of Drop Pipe 13 ft. capacity 12 G.P.M.			
				TYPE: Is Submersible <input type="checkbox"/> Jet			
				PRESSURE TANK:			
				Manufacturer's name	Capacity 12 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.			

Data Source: Michigan Groundwater Survey

12. Big Operator's Name:

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WATER WELL AND PUMP RECORDS

LOCATION OF WELL	3971120001	B6	Page 1 of 1
County	Township Name	Section	Tax Parcel #
KALAMAZOO	PAVILLION	SW 1/4 NW 1/4 SE 1/4	Section 20 Town 03 S Range 10 W
Distance And Direction From Road Intersection .5 MI. W. OF ZEPH ST. SP FT. S. OF YR AVE. 6648 YR AVE., KALAMAZOO 49001		OWNER OF WELL HENRY RODDINGER Address 6648 YR AVE. KALAMAZOO, MI 49001	
Street Address & City of Well Location		Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Locate with 'X' in Section Below		Sketch Map	
ELEVATION 861.00 msl			
Z	FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
FILL		5	5
MARL		20	25
CLAY		15	40
VERY FINE SAND		10	70
COARSE SAND		5	75
15. Remarks, elevation, source of data, etc.			
16. OWNER WELL CONTRACTOR'S CERTIFICATIONS: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.			
Data Source: Michigan Groundwater Survey		0708	
17. Rig Operator's Name:		REGISTERED BUSINESS NAME	
Address:		REGISTRATION NO.	
Signed:		Date:	

Data Source: Michigan Groundwater Survey

17. Big Operator's Name:

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WATER WELL AND PUMP RECORD

Page 1 of 1

15. Remarks, elevation, source of data, etc.
FERMIT 16773

Data Source: Michigan Groundwater Survey

12. Big Operator's Name:

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WATER WELL AND PUMP RECORD

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WATER WELL AND PUMP RECORD

LOCATION OF WELL	19700900000	B10	PAGE 1 OF 1	THE PARCEL
County	TALAWA ZOO	Township Name	WAKESHA	
Distance And Direction From Road Intersection 250' E OF 36TH AND 100' S OF T 1100 T AVENUE, WISCONSIN 54097		W 1/4 SW 1/4 NW 1/4	Section 06	Town 04 S Range 09 W
Street Address & City of Well Location				
Locate with 'X' in Section Below		Sketch Map		
ELEVATION 900.00 ft				
2 FORMATION DESCRIPTION				
SAND & GRAVEL	18	DEPTH TO BOTTOM OF STRATUM	18	THICKNESS OF STRATUM
SAND LIGHT GRAVEL BROWN CLAY	1		25	
BROWN CLAY & GRAVEL	9		13	
GRET CLAY & FINE TO COARSE GRAVEL	20		51	
GRET CLAY & FINE SAND & GRAVEL	21		74	
BLK SHADE	26		100	
15. Remarks, elevation, source of data, etc. OPEN BORE 10' 100'				
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.				
Data Source: MOWR		REGISTERED BUSINESS NAME		REGISTERED F.D.I.
17. Rig Operator's Name:				

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WATER WELL AND PUMP RECORD

Data Source: SIEUR

17. Big Operator's Name:

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WATER WELL AND PUMP RECORD

Page 1 of

Location of Well		39731211012	C-1		Page 1 of 7								
County	KALAMAZOO	Township Name	TEXAS	Fraction	SW 1/4	SE 1/4	NE 1/4	Section	11	Town	03 S	Range	12 W
Distance And Direction From Road Intersection 1450' E, 2100' S 1/4 M & 0' 7254E, KALAMAZOO 49009				Owner of Well Address: 415 STOCKBRIDGE, KALAMAZOO, MI 49009 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No									
Street Address & City of Well Location				City of KALAMAZOO CITY OF KALAMAZOO 415 STOCKBRIDGE, KALAMAZOO, MI 49009									
Locate with 'X' in Section Below				Sketch Map									
ELEVATION 915.00 msL													
2 FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	3. WELL DEPTH: Date Completed: New Well 362.0 FT. 10/17/71 Replacement Well									
SAND CLAY		4	4	4. CABLE TOOL: Rotary <input checked="" type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted									
SAND GRAVEL CLAY		8	12	5. HSE: Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Test Well <input type="checkbox"/> Type II Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type II Public <input type="checkbox"/> Irrigation Public									
SAND, GRAVEL, LITTLE CLAY		31	43	6. CASING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded Height: Above Diameter: 12.00 in. To 342.0 ft. depth Surface 2.0 ft. 0.00 in. To 0.0 ft. depth Weight lbs/ft. Cased Drill Hole Diameter: 8.00 in. To 0.0 ft. depth Drive Shoe <input checked="" type="checkbox"/> Yes 0.00 in. To 0.0 ft. depth <input type="checkbox"/> No									
SAND, LITTLE GRAVEL, LITTLE CLAY		19	53	7. SCREEN: <input type="checkbox"/> Not Installed Type Other <input type="checkbox"/> Diameter 12.00 SLOT 0.060 <input type="checkbox"/> Length 5.0 Set between 342.00 ft. and 147.00 ft.									
SAND, LITTLE GRAVEL		29	61	8. FITTINGS: <input type="checkbox"/> Blank <input type="checkbox"/> T-Header <input type="checkbox"/> Head Packer <input type="checkbox"/> Blank above screen 0.0 ft. <input type="checkbox"/> Other									
SAND, LITTLE GRAVEL, LITTLE CLAY		7	68	9. STATIC WATER LEVEL: 23.00 ft. below land surface <input type="checkbox"/> Flow									
CLAY		4	92	10. PUMPING LEVEL: below land surface 0 ft. after 4.0 hrs. pumping at 1000 G.P.M. 0 ft. after 0.0 hrs. pumping at 9 G.P.M.									
SAND CLAY		14	106	11. WELL READ:									
CLAY SAND GRAVEL		7	111	COMPLETION: <input type="checkbox"/> Drillless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit									
SAND, GRAVEL, LITTLE CLAY		8	121	12. WELL SPANNED?: <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> ft. to ft. 1st cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement <input type="checkbox"/> Additives									
CLAY SAND GRAVEL		3	124	13. Nearest source of possible contamination Type Sewer Distance 2500 ft. Direction NE Was it disinfected or completed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No									
CLAY SAND		11	156	14. PUMP: <input type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name <input type="checkbox"/> NP Model number <input type="checkbox"/> NP Volts Length of Draw Pipe 0 ft. capacity 0 G.P.M.									
FINE SAND, CLAY		31	220	15. PRESSURE TANK: Type <input type="checkbox"/> Submersible <input type="checkbox"/> Jet									
CLAY		28	225	Manufacturer's name Model number Capacity 0 Gallons									
SAND CLAY		6	210	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.									
SAND, LITTLE CLAY		5	255										
MEDIUM SAND, LITTLE CLAY		5	285										
SAND, LITTLE GRAVEL, LITTLE CLAY		25	290										
SAND, GRAVEL, LITTLE CLAY		30											
SAND, LITTLE GRAVEL, LITTLE CLAY		5											
15. Remarks, elevation, source of data, etc. SLOT, 130 LENGTH 15', SET BETWEEN 347 AND 362													
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.													
Data Source: MNR										REGISTERED BUSINESS NAME			
17. Rig Operator's Name:										REGISTRATION #:			
Address:										Date:			
Signed:													

Data Source: SONY

17. Rig Operator's Name:

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WATER WELL AND PUMP RECORD

Page 2 of 2

1 LOCATION OF WELL County: KALAMAZOO Distance And Direction From Road Intersection: 1450' E., 2100' S. 101 & Q AVENUE, KALAMAZOO 49001 Street Address & City of Well Location:		101 Sketch Map		Tax Parcel 1 Section 11 Town 03 S Range 12 W			
Locate with 'X' in Section Below				4 WELL DEPTH: <input checked="" type="checkbox"/> 162.0 ft. <input type="checkbox"/> 160 ft. <input type="checkbox"/> 164 ft. <input type="checkbox"/> New Well <input checked="" type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Drill			
				5 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Test Well <input type="checkbox"/> Type II Public <input type="checkbox"/> Type IV Public <input type="checkbox"/> Residential <input type="checkbox"/> Other Public			
				6 CASTING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded Height: Above Surface 2.0 ft. Diameter: 12.00 in. to 342.0 ft. depth Weight lbs/ft. 0.00 in. to 0.0 ft. depth Grouted Drill Hole Diameter: Drive Shoe <input checked="" type="checkbox"/> Yes 0.00 in. to 0.0 ft. depth <input type="checkbox"/> No			
				7 SCREEN: <input type="checkbox"/> Not Installed Type Other <input type="checkbox"/> Diameter 2.00 SLOT: 0.050 <input type="checkbox"/> Length 5.0 Set between 312.00 ft. and 147.00 ft. FITTINGS: <input type="checkbox"/> L.L. Packer <input type="checkbox"/> Head Backer <input type="checkbox"/> Borehole Check <input type="checkbox"/> Blank above screen 0.0 ft. <input type="checkbox"/> Other			
				8 STATIC WATER LEVEL: 21.00 ft. below land			
				9 PUMPS: Level: below land surface 40 ft. after 4.0 hrs. pumping at 1000 G.P.M. 0 ft. after 0.0 hrs. pumping at 0 G.P.M.			
				10 WELL HEAD COMPLETION: <input type="checkbox"/> Drillless adapter <input checked="" type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit			
				11 WELL CROPPED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> To ft. <input type="checkbox"/> Drill cement <input type="checkbox"/> Reinforcing <input type="checkbox"/> Other No. of bags of cement: Additives:			
				12 Nearest source of possible contamination Type Soaker Distance 2500 ft. Direction NW Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
				13 PUMP: <input type="checkbox"/> Not installed <input checked="" type="checkbox"/> Pump Installation Only Manufacturer's name Model number HP Volts Length of Drop Pipe: 0 ft. capacity 0 G.P.M. TYPE: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name Model number Capacity 0 Gallons			
15. Remarks, elevation, source of data, etc.: SLOT, 130' LENGTH 15', SET BETWEEN 347 AND 362		16. 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	
Data Source: MDRB		REGISTERED BUSINESS NAME				REGISTRATION NO.	
17. Rig Operator's Name:		Address					
		State				AUTHORIZED REPRESENTATIVE	
						Date	

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WATER WELL AND PUMP RECORD

page 1 of 1

LOCATION OF WELL		39731/06102	C-1		Tax Parcel I	
County	BALTIMORE	Section	SE 1/4	SW 1/4	W 1/2	S 1/2
TOWNSHIP NAME		Section No.	06	Town	03 S	Range
Distance And Direction From Road Intersection				M		
WESTFIELD, Street Address & City of Well location				Address		
Locate with 'X' in Section Boxes				Sketch Map		
ELEVATION 905.05 msL						
Z	FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM			
SAND AND GRAVEL	6	6				
SAND	6	12				
SAND	19	51				
SAND	48	99				
GRAVEL	12	111				
SAND & GRAVEL	11	122				
CLAY , SILTY	5	127				
SAND	9	136				
SAND	3	139				
GRAVEL & SAND	20	145				
SAND , GRAVEL , SOME SHALE??	16					
15. Remarks,elevation,source of data,etc.						
Data Source: Michigan Groundwater Survey						
17. Big Operator's Name:						
1. OWNER OF WELL				CITY OF MORTAGE		
Address						
Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						
2. WELL DEPTH: 195.0 FT. Date Completed: 04/23/01				New Well <input type="checkbox"/> Replacement Well		
<input type="checkbox"/> Cable tool <input type="checkbox"/> Hollow rod <input type="checkbox"/> Rotary <input type="checkbox"/> Auger/Bored				Driven <input type="checkbox"/> Jetted <input checked="" type="checkbox"/> Unknown		
3. USE: Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Test Well <input type="checkbox"/> Type II Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Agricultural Pump						
4. CASTING: Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded				Height: Above Surface 0.0 ft.		
Diameter: 0.00 in. to 0.0 ft. depth <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Unknown				Weight: lbs./ft.		
0.00 in. to 0.0 ft. depth <input type="checkbox"/> Unknown <input type="checkbox"/> Plastic <input type="checkbox"/> Metal				Drive Shoe <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Cored Drill Hole Diameter: 0.00 in. to 0.0 ft. depth <input type="checkbox"/> Unknown <input type="checkbox"/> Plastic <input type="checkbox"/> Metal						
5. SCREEN: Type Unknown <input type="checkbox"/> Not Installed <input type="checkbox"/> Unknown <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Length 0.0 in. between 0.0 ft. and 0.0 ft. <input type="checkbox"/> Unknown <input type="checkbox"/> Plastic <input type="checkbox"/> Metal <input type="checkbox"/> Length 0.0						
6. FITTINGS: <input type="checkbox"/> Back Packer <input type="checkbox"/> Head Pack <input type="checkbox"/> Breacher Check <input type="checkbox"/> Blank above screen 0.0 ft. Other						
7. STATIC WATER LEVEL: 16.77 ft. below land surface <input type="checkbox"/> Flow <input type="checkbox"/> Non-flow						
8. FLOWING LEVEL: below land surface <input type="checkbox"/> Flatter 0.0 hrs.pumping at 0 G.P.M. <input type="checkbox"/> Flatter 0.0 hrs.pumping at 0 G.P.M.						
9. WELL HEAD COMPLETION: <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit						
10. WELL GROUTED? <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Grout to ft. <input type="checkbox"/> Mortar <input type="checkbox"/> Gunite <input type="checkbox"/> Other <input type="checkbox"/> No. of bags of cement <input type="checkbox"/> Additives						
11. Nearest source of possible contamination Type Unknown Distance 0 ft. Direction <input type="checkbox"/> Yes <input type="checkbox"/> No Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Has old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No						
12. PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump installation Only Manufacturer's name <input type="checkbox"/> Model number <input type="checkbox"/> Volts <input type="checkbox"/> Length of Drop Pipe 0 ft. capacity 0 G.P.M. <input type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Pressure tank <input type="checkbox"/> Manufacturers name <input type="checkbox"/> Model number <input type="checkbox"/> Capacity 0 gallons						
13. 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 _____						

Data Source: Michigan Grandfather Survey

Data Source: Michigan Graduate Survey

REGISTERED BUSINESS NAME _____

REGISTRATION NO.

Mémoires

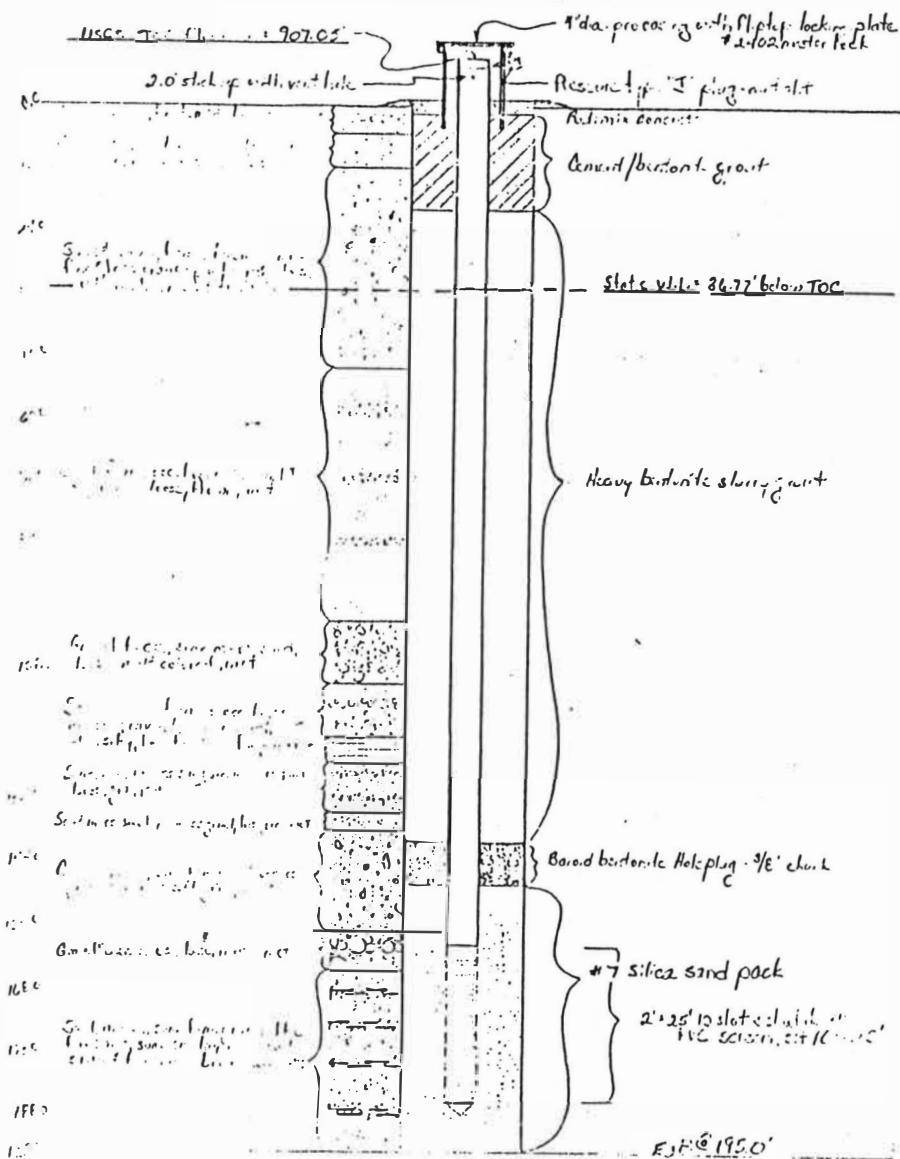
AUTHORIZED REPRESENTATIVE

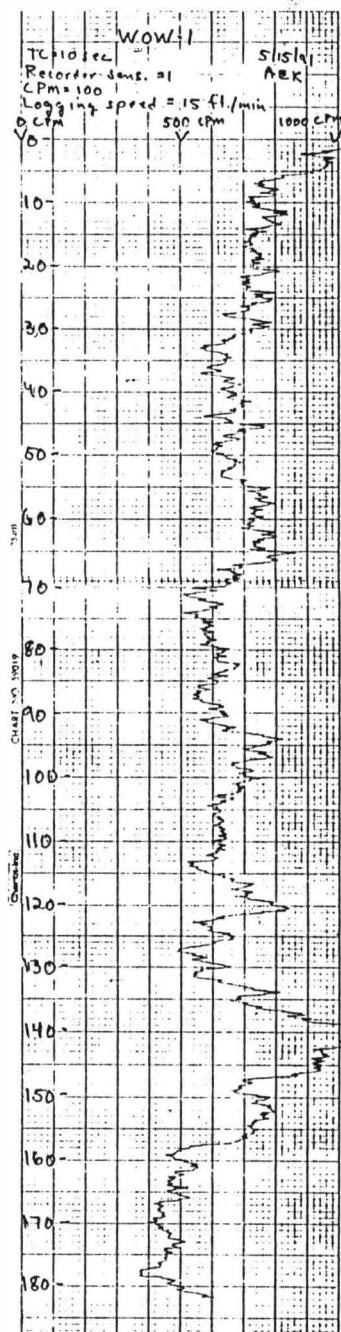
Date

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Calculation Sheet

C2

Computed by C. L. L.
Checked by _____Subject WOW-1 well Sheet 1 of 1
inner wellbore wellbore Job No. 81-97
Client WOW Project Date 4/29/91



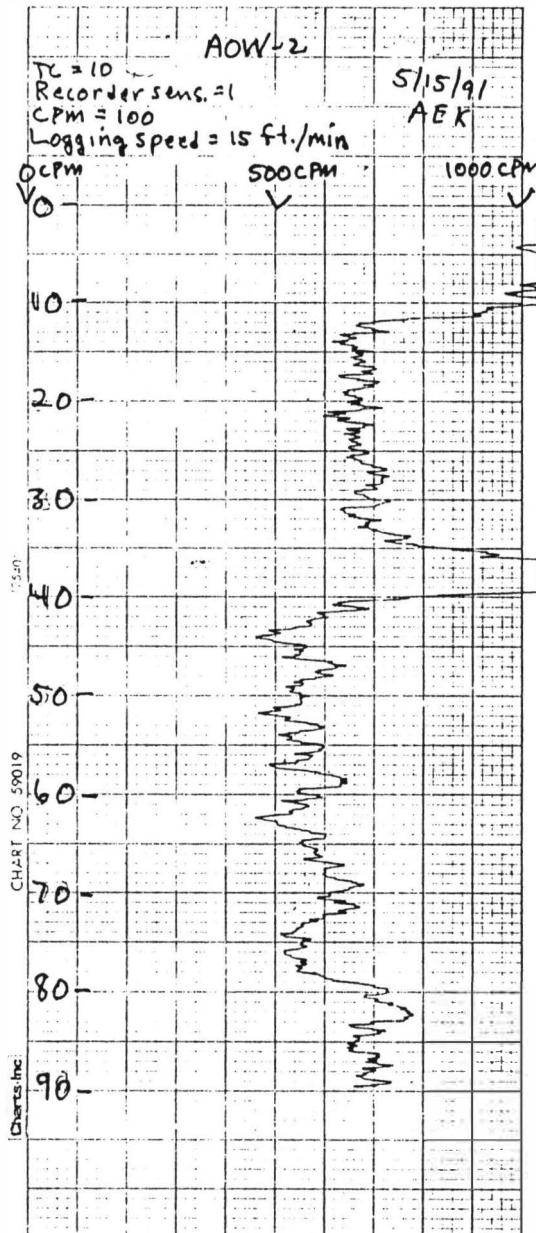
C2

WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 1973108300		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						CITY OF PORTAGE MI	
Locate with 'X' in S		Sketch Map		Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
				4 WELL DEPTH: <input checked="" type="checkbox"/> 90.5 FT. <input type="checkbox"/> Date Completed 04/02/61 <input type="checkbox"/> New Well <input type="checkbox"/> Replacement Well			
				5 <input type="checkbox"/> Cable tool <input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted <input checked="" type="checkbox"/> Unknown			
				6 USE <input type="checkbox"/> Domestic <input checked="" type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Type II Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Test Well <input type="checkbox"/> Type Iih Public <input type="checkbox"/> Heat Pump			
				7 CASING: <input type="checkbox"/> Steel <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded Diameter 0.00 in. to 0.0 ft. depth <input type="checkbox"/> Weight lbs/ft. 0.00 in. to 0.0 ft. depth <input type="checkbox"/> Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Grouted Drill Hole Diameter 0.00 in. to 0.0 ft. depth <input type="checkbox"/> 0.00 in. to 0.0 ft. depth <input type="checkbox"/>			
				8 SCREEN: <input type="checkbox"/> Not Installed Type Stainless Steel <input type="checkbox"/> Diameter 0.00 Jdkn 0.000 <input type="checkbox"/> Length 0.0 Set between 0.00 ft. and 0.00 ft. FITTINGS: <input checked="" type="checkbox"/> Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 0.0			
				9 STATIC WATER LEVEL: 43.00 ft. below land surface <input type="checkbox"/> 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 COMPIRATION: <input type="checkbox"/> Pitless adapter <input checked="" type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit			
				12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From to ft. <input type="checkbox"/> Mort cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement Additives			
				13 Nearest source of possible contamination Type Unknown Distance 0 ft. Direction Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
				14 PUMP: <input checked="" type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name _____ Model number _____ HP _____ Volts _____ Length of Drop Pipe 0 ft. capacity 0 G.P.M. TYPE: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name _____ Model number _____ Capacity 0 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.					
Data Source: Michigan Groundwater Survey		REGISTERED BUSINESS NAME _____				REGISTRATION NO. _____	
17. Rig Operator's Name:		Address _____		Signed _____		Date _____	
AUTHORIZED REPRESENTATIVE _____							

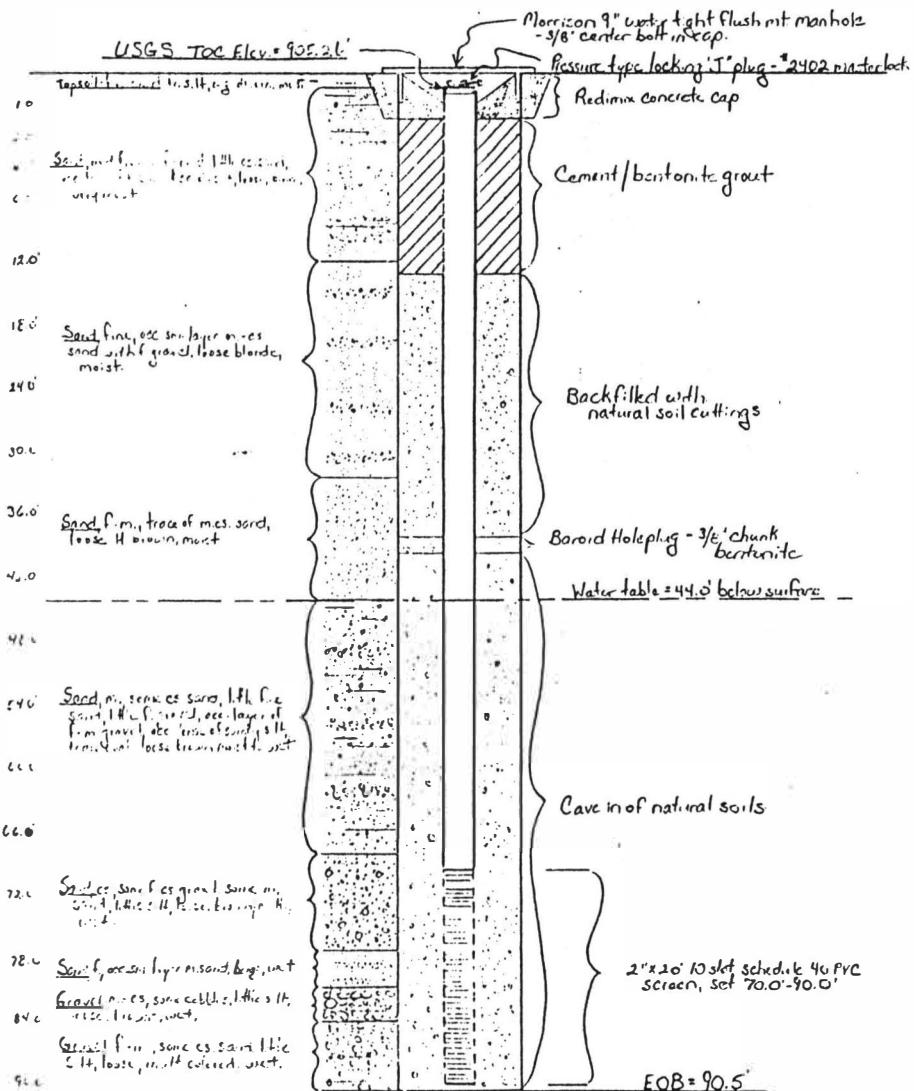
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C3

Calculation Sheet

W Computed by C.C. Lai Subject Anal-2 diagram Sheet 1 of 1
Checked by Ambrely wellfield Job No. 89597
Client C. I. C. F. Parcage Date 4/3/91



WATER WELL AND PUMP RECORD

Page 1 of 2

1 LOCATION OF WELL	39731116300	C4	Tax Parcel
County	KALAMAZOO	Township Name	PORTAGE
Distance And Direction From Road Intersection		Fraction	NW 1/4 SE 1/4 NW 1/4
WINTERFOREST 1, Street Address & City of Well Location		Section	16
Locate with 'X' in Section Below		Town	03 S
		Range	11 W
		Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		Mile	
		Address	
		CITY OF PORTAGE	
		WELL DEPTH: <input checked="" type="checkbox"/> 111.0 FT. <input type="checkbox"/> Date Completed 04/18/91 <input type="checkbox"/> New Well <input type="checkbox"/> Replacement Well	
		<input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input checked="" type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted <input type="checkbox"/> Unknown	
		6 USE <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input checked="" type="checkbox"/> Irrigation <input type="checkbox"/> Type II Public <input type="checkbox"/> Heat Pump <input checked="" type="checkbox"/> Test Well <input type="checkbox"/> Type IIIb Public	
		CASING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Plastic <input type="checkbox"/> Welded Height: Above Diameter: 0.00 in. to 0.0 ft. depth Surface 0.0 ft. 0.00 in. to 0.0 ft. depth Weight lbs/ft. 0.00 in. to 0.0 ft. depth Drive Shoe <input checked="" type="checkbox"/> Yes 0.00 in. to 0.0 ft. depth <input type="checkbox"/> No	
		SCREEN <input checked="" type="checkbox"/> Not Installed Type Stainless Steel Diameter 0.00 Unkn Length 0.0 and 0.00 ft.	
		FITTINGS: <input checked="" type="checkbox"/> IX-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Bremer check <input checked="" type="checkbox"/> Blank above screen 0.0 ft. Other	
		9 STATIC WATER LEVEL: 7.50 ft. below land surface <input type="checkbox"/> 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: <input checked="" type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit	
		12 WELL GROUTED? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes From to ft. I Mean cement <input checked="" type="checkbox"/> Bentonite <input type="checkbox"/> Other No of bags of cement Additives	
		13 Nearest source of possible contamination Type Septic Distance 0 ft. Direction Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
		14 PUMP: <input checked="" type="checkbox"/> Not installed <input type="checkbox"/> Pump Installation Only Manufacturer's name _____ Model number HP Volts Length of Drop Pipe 0 ft. capacity 0 G.P.M. TYPE: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet	
		PRESSURE TANK: Manufacturers name _____ Model number Capacity 0 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.	
Data Source: Michigan Groundwater Survey		REGISTERED BUSINESS NAME	REGISTRATION NO.
17. Rig Operator's Name:		Address	
		Signed	Authorized Representative
		Date	

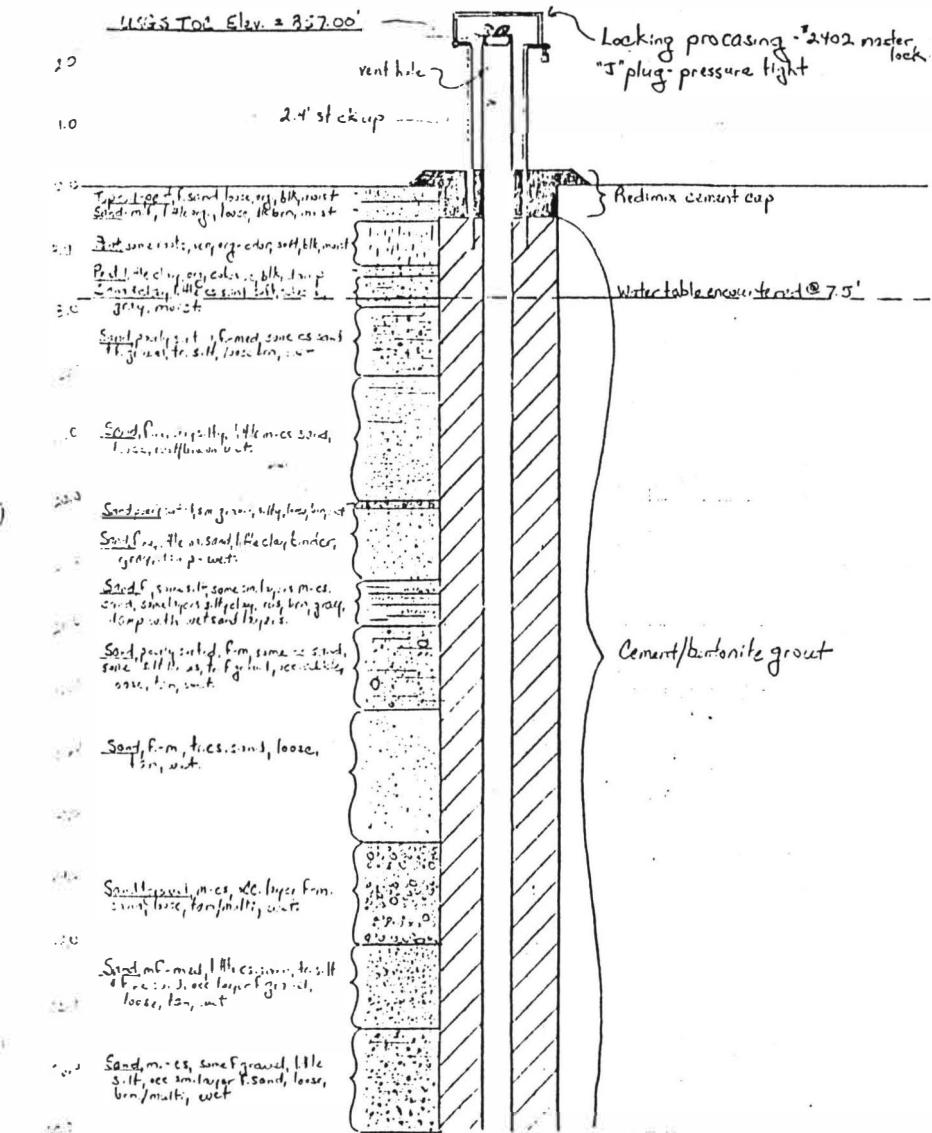
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WATER WELL AND PUMP RECORD

LOCATION OF WELL 1971111A00	Township Name PORTAGE	Fraction NW 1/4 SE 1/4 NW 1/4			Section 16	Town 03 S	Range 11 W	Tax Parcel # C 4
Distance And Direction From Road Intersection WINTER FOREST 1.				OWNER OF WELL Address CITY OF PORTAGE MI				
Street Address & City of Well Location Locate with 'X' in Section Below				Sketch Map				
ELEVATION 854.60 ms)								
2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM						
SAND & GRAVEL	1	75						
SAND	4	80						
SAND	8	88						
SAND	13	101						
SAND	5	106						
SAND	1	107						
SAND & GRAVEL	3	110						
SAND & CLAY	1	111						
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.		
Data Source: Michigan Groundwater Survey						REGISTERED BUSINESS NAME		
17. Rig Operator's Name:						REGISTRATION NO.		
Signed						AUTHORIZED REPRESENTATIVE		

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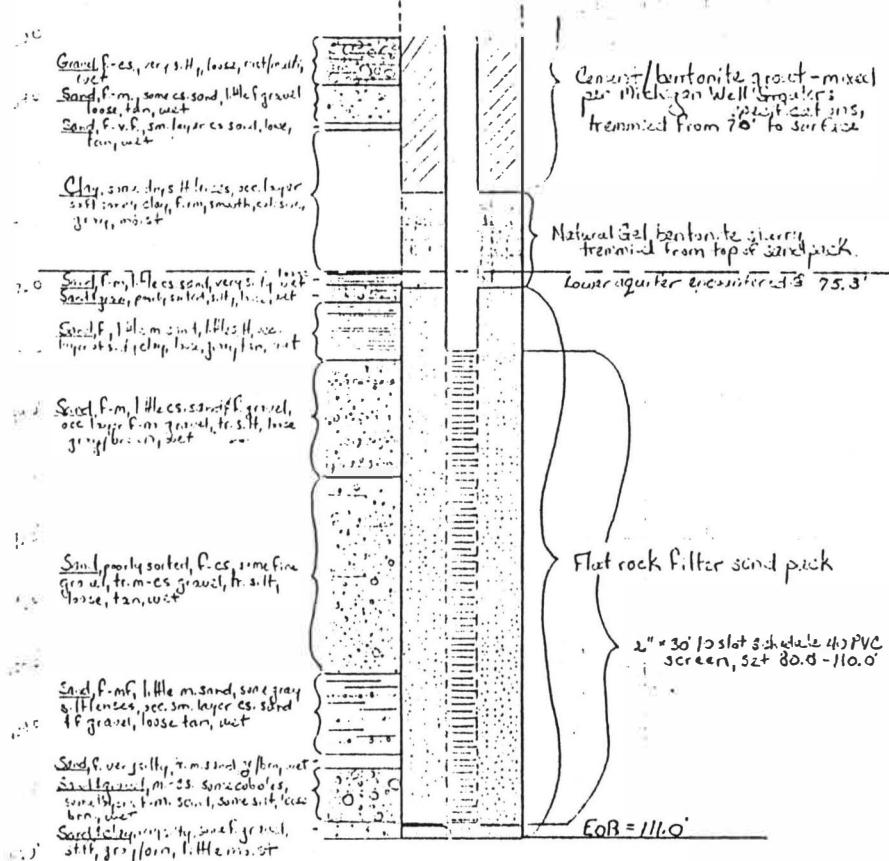
Calculation Sheet C.4

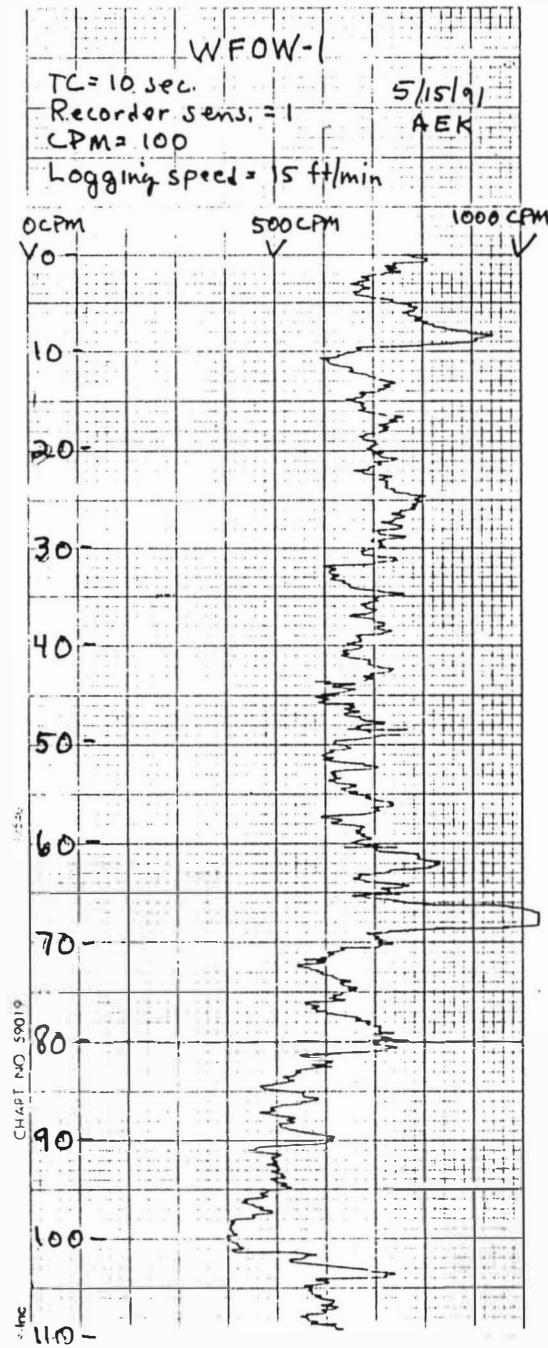
Computed by C. Cotton
Checked by _____Subject W.Fowl-Ld.22run Sheet 1 of 2
Wintonforest well Field Job No. 89597
Client City of Portage Date 4/18/91

Calculation Sheet C4

V Computed by C. L. Johnson
Checked by _____

Subject WFOW-1d 12/11/11 Sheet 2 of 2
Winter forest wiffle Job No. 89597
Client City of Portage Date 4/13/11





WATER WELL AND PUMP RECORD

Page 1 of

LOCATION OF WELL		397311114200	C5	Page 1 of 1		Tax Parcel #
County KALAMAZOO	Township Name PORTAGE	Fraction NW 1/4 NW 1/4 NE 1/4	Section 14	Town 03 S	Range 11 W	
Distance And Direction From Road Intersection RJ-106, Street Address & City of Well Location			OWNER OF WELL Address UPJOHN MONITORING WELL Address MI Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Indicate with 'X' in Section Below			Sketch Map			
ELEVATION 871.50 msl						
FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM			
FINE SAND AND TOPSOIL, LITTLE SILT, TRACE GRAVEL, MEDIUM & COARSE SAND		2	2			
FINE SAND FILL, LITTLE CLAY, TRACE SILT, GRAVEL AND COARSE SAND		5	7	8 SCREEN: <input type="checkbox"/> Stainless Steel Diameter 0.00 <input type="checkbox"/> Unkn. 0.000 Length 0.0 <input type="checkbox"/> Set between 0.00 ft. and 0.00 ft. 9 STATIC WATER LEVEL: <input type="checkbox"/> 0.00 ft. below land surface <input type="checkbox"/> Flow		
CLAYEY FINE TO MEDIUM SAND & TRACE COARSE SAND & GRAVEL		7	14	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.		
SILTY CLAY, TRACE GRAVEL & SAND		4	18	11 WELL HEAD COMPENSATION: <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit		
FINE SAND, LITTLE SILT AND MEDIUM SAND, TRACE CLAY, GRAVEL & COARSE SAND		4	22	12 WELL CROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From _____ to _____ ft. <input type="checkbox"/> I heat cement <input type="checkbox"/> I bentonite <input type="checkbox"/> I other No. of bags of cement _____ Additives _____		
FINE SAND		6	28	13 Nearest source of possible contamination Type Septic Distance 0 ft. Direction _____ Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No		
FINE TO MEDIUM SAND, LITTLE GRAVEL & COARSE SAND, TRACE SILT		19	47	14 PUMP: <input type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name _____ Model number _____ HP _____ Volts _____ Length of Drop Pipe 0 ft. capacity 0 G.P.M. Type: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet		
FINE TO MEDIUM SAND, LITTLE COARSE SAND, TRACE SILT AND FINE GRAVEL		11	58	15. Remarks, elevation, source of data, etc. MW-101, MW-105, MW-106		
16. WATER WELL CONDUCTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.						
Data Source: Michigan Groundwater Survey			REGISTERED BUSINESS NAME _____			
17. Rig Operator's Name: _____			REGISTRATION NO. _____			

Data Source: Michigan Groundwater Survey

17 Big Operator's Name:

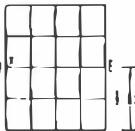
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WATER WELL AND PUMP RECORD					
1 LOCATION OF WELL		39731114200 CS		Page 2 of 2	
County KALAMAZOO	Township Name PORTAGE	Fraction NW 1/4 NW 1/4 NE 1/4	Section 14	Town 03 S	Range 11 W
Distance And Direction From Road Intersection HJ-106, Street Address & City of Well Location			1 OWNER OF WELL DJOHN MONITORING WELL Address		
Locate with 'X' in Section Below			Sketch Map		
ELEVATION 871.50 ps)					
2 FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	7 CASING:	
MEDIUM TO COARSE SAND , LITTLE FINE SAND , TRACE FINE GRAVEL		12	94	<input type="checkbox"/> Steel	<input checked="" type="checkbox"/> Threaded
FINE SAND , TRACE SILT, AND MEDIUM SAND		5	99	<input type="checkbox"/> Plastic	<input checked="" type="checkbox"/> Welded
FINE TO MEDIUM SAND , LITTLE TO TRACE		38	137	Diameter 0.00 in. to 0.0 ft. depth	Height: Above Surface 0.0 ft.
GRAVEL , TRACE SILT AND COARSE SAN				0.00 in. to 0.0 ft. depth	Weight lbs/ft.
SILTY FINE SAND , TRACE CLAY AND MEDIUM SAND		6	143	Gravel & Drill Hole Diameter 0.00 in. to 0.0 ft. depth	Drive Shoe <input checked="" type="checkbox"/> Yes
SANDY SILT, SOME FINE SAND , TRACE MEDIUM		6	149	0.03 in. to 0.0 ft. depth	<input checked="" type="checkbox"/> No
6 FINE GRAVEL					
FINE TO MEDIUM SAND ,TRACE SILT		5	154	8 SCREEN: Type: Stainless Steel Unknown 0.000 S.L. between 0.00 ft. and 0.00 ft.	<input checked="" type="checkbox"/> Not Installed
GRAVELLY FINE TO MEDIUM SAND , TRACE		5	159	PITCINGS: 1 Blank above screen 0.0 ft. Other	
SILT AND COARSE SAND					
FINE TO MEDIUM SAND , TRACE SILT, FINE		35	194	9 STATIC WATER LEVEL: 0.00 ft. below land surface	<input checked="" type="checkbox"/> Flow
GRAVEL & COARSE SAND					
FINE SAND ,TRACE SILT AND COARSE SAND		5	199	10 DRYING LEVEL: below land surface 0 ft. after 0.0 hrs. pumping at 0 G.P.M.	
MEDIUM TO COARSE SAND , SOME GRAVEL ,		10	209	0 ft. after 0.0 hrs. pumping at 0 G.P.M.	
LITTLE FINE SAND , TRACE SILT AND					
FINE TO MEDIUM SAND , LITTLE COARSE SAND		30	239	11 WELL HEAD COMPLETION: <input checked="" type="checkbox"/> Pitless adapter <input checked="" type="checkbox"/> Basement offset	<input checked="" type="checkbox"/> 12" above grade <input checked="" type="checkbox"/> Approved pit
, TRACE SILT AND GRAVEL					
MEDIUM TO COARSE SAND , LITTLE GRAVEL ,		7	246	12 WELL GROUTED? <input checked="" type="checkbox"/> No holes from to ft. <input checked="" type="checkbox"/> Mortal cement <input checked="" type="checkbox"/> Bentonite <input checked="" type="checkbox"/> Other No. of bags of cement Additives	
TRACE SILT AND FINE S					
15. Remarks,elevation,source of data,etc. MW-101, MW-105, MW-106	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.				
Data Source: Michigan Groundwater Survey	REGISTERED BUSINESS NAME				REGISTRATION NO.
17. Rig Operator's Name:	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	39731126002	C4	Tax Parcel No.
County KALAMAZOO	Township Name PORTAGE	Fraction SW 1/4 SW 1/4 NW 1/4	Section No. 36 Town No. 03 S Range No. 11 W
Address or Description from Road Intersection 3301 WOODHAMS, PORTAGE 49002 Street Address & City of Well Location		3 OWNER OF WELL FRED DENNICK Address 3301 WOODHAMS PORTAGE, MI 49002 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Locate with 'x' in Section Below 	Sketch Map: 	4 WELL DEPTH: 110.0 ft. Date Completed 06/25/85 <input type="checkbox"/> New Well <input checked="" type="checkbox"/> Replacement Well	5 <input checked="" type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Auger <input type="checkbox"/> Jeted
		6 USE <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Septic Well <input type="checkbox"/> Type II Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Meat Pump	7 CASING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded Height: Above Surface 1.0 ft. Diameter 4.00 in. to 105.0 ft. depth Weight ___ lbs/ft. 0.00 in. to 0.0 ft. depth Grouted Drill Hole Diameter <input type="checkbox"/> Yes 0.00 in. to 0.0 ft. depth Drive Shoe <input checked="" type="checkbox"/> No
ELEVATION 860.00 nsf		8 SCREEN Type Stainless Steel Diameter 3.00 SLOT 0.010 Length 5.0 Set between 105.00 ft. and 110.00 ft.	9 STATIC WATER LEVEL: 1.00 ft. below land surface <input type="checkbox"/> 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: <input checked="" type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Backseat offset <input type="checkbox"/> Approved pit
		12 WELL GROUPED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes from 0.0 to 20.0 ft. <input type="checkbox"/> Mag cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement ___ Additives ___	13 Nearest source of possible contamination Type Sewer Distance 30 ft. Direction Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		14 PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump Installation Only Manufacturer's name STANDARD Model number HP .75 Volts Length of pump pipe 60 ft. capacity 19 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturers name Model number Capacity 10 Gallons	15 Remarks, elevation, source of data, etc. Data Source: MNR
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.	SMITH WELL & PUMP COMPANY REGISTERED BUSINESS NAME 1793 Address 2380 HICKORY ROAD BATILE CREEK, MI 49012 Signed _____ AUTHORIZED REPRESENTATIVE _____ Date _____

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	1 C7	Tax Parcel #												
County	KALAMAZOO	Township Name	PAVILION	Fraction	SE 1/4 SW 1/4 NW 1/4	Section	11	Town	03 S	Range	10 W				
Distance And Direction From Road Intersection 25 MI. S. OF S AVP., 25 MI. E. OF SPRINKLE RD. 10405 SPRINKLE RD., KALAMAZOO 49001				3 OWNER OF WELL	LARRY FORSYTHE Address SPRINKLE RD. KALAMAZOO, MI 49001 Address Same As Well location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No										
Street Address & City of Well Location				4 WELL DEPTH:	30.0 FT.	Date Completed	01/13/76	<input checked="" type="checkbox"/> New Well	<input type="checkbox"/> Replacement Well						
Locate with 'I' in Section Below				Sketch Map	5	Cable tool	<input type="checkbox"/> Rotary	<input type="checkbox"/> Driven	<input type="checkbox"/> Dug	<input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bared <input type="checkbox"/> Jetted					
					6 USE	<input checked="" type="checkbox"/> Domestic	<input type="checkbox"/> Type I Public	<input type="checkbox"/> Type II Public	<input type="checkbox"/> Heat Pump	<input type="checkbox"/> Irrigation <input type="checkbox"/> Test Well <input type="checkbox"/> Type III Public					
				7 CASING:	<input type="checkbox"/> Steel	<input checked="" type="checkbox"/> Plastic	<input type="checkbox"/> Threaded	<input type="checkbox"/> Welded	Height: Above Surface 1.0 ft.						
				Diameter	2.00 in. to 27.0 ft. depth	Weight	lbs/ft.								
				0.00 in. to 0.0 ft. depth											
				Ground Drill Hole Diameter	Drive Shoe <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No										
				0.00 in. to 0.0 ft. depth											
				0.00 in. to 0.0 ft. depth											
				8 SCREEN	<input type="checkbox"/> Not installed										
				Type Stainless Steel	Diameter	1.25									
				SLOT	0.010	Length	4.0								
				Set between	26.00 ft. and 30.00 ft.										
				FITTINGS:	<input type="checkbox"/> Packer	<input type="checkbox"/> Lead Packer	<input type="checkbox"/> <input checked="" type="checkbox"/> Bremer Check								
				<input type="checkbox"/> Blank above screen 0.0 ft.	Other										
				9 STATIC WATER LEVEL:	12.00 ft. below land surface <input type="checkbox"/> 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:	<input type="checkbox"/> Pitless adapter	<input type="checkbox"/> 12" above grade									
				<input type="checkbox"/> Basement offset		<input type="checkbox"/> Approved pit									
				12 WELL CROSTED?	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	From	To	ft.						
				<input type="checkbox"/> Mort cement	<input type="checkbox"/> Bentonite	<input type="checkbox"/> Other									
				No. of bags of cement	Additives										
				13 Nearest source of possible contamination											
				Type Septic	Distance	55 ft.	Direction	N							
				Well disinfected upon completion?	<input type="checkbox"/> Yes	<input type="checkbox"/> No									
				Was old well plugged?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No									
				14 PUMP: <input type="checkbox"/> Not installed	<input type="checkbox"/> Pump Installation Only										
				Manufacturer's name											
				Model number	R.P.	Volts									
				Length of Drop Pipe	0 ft.	capacity	0 G.P.M.								
				TYPE:	<input type="checkbox"/> Submersible	<input type="checkbox"/> Jet									
				PRESSURE TANK:											
				Manufacturers name	Capacity 0 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.											
				Address	REGISTERED BUSINESS NAME										
				Signed	REGISTRATION NO.										
				AUTHORIZED REPRESENTATIVE											
				Date											
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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL 39741005013		C8		Tax Parcel #			
County KALAMAZOO	Township Name BRADY	Fraction SW 1/4 NW 1/4 NE 1/4	Section 05	Twp 04 S	Range 10 W		
Distance And Direction From Road Intersection 1000' N OF YU AVENUE AND 200' E OF 26TH 11171 S 26TH, VICKSBURG 49097		1 OWNER OF WELL ELLIS, REED Address 2454 CROUSE CT PORTAGE, MI 49002					
Street Address & City of Well Location		Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Locate with 'X' in Section Below		Sketch Map		4 WELL DEPTH: <input checked="" type="checkbox"/> New Well 90.0 ft. <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input checked="" type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Burred <input type="checkbox"/> Jetted			
				5 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type II Public <input type="checkbox"/> Heat Pump <input checked="" type="checkbox"/> Test Well <input type="checkbox"/> Type IIb Public <input type="checkbox"/>			
		ELEVATION 867.00 msl		6 CASING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Plastic <input type="checkbox"/> Welded Height: Above Surface 1.0 ft. Diameter 4.00 in. to 86.00 ft. depth Weight lbs/ft. 8.00 in. to 0.0 ft. depth Ground Drill Hole Diameter Drive Shoe <input checked="" type="checkbox"/> Yes 0.00 in. to 0.0 ft. depth <input type="checkbox"/> No 0.00 in. to 0.0 ft. depth			
2 FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	7 SCREEN: <input checked="" type="checkbox"/> Not Installed Type: Stainless Steel Diameter 4.00 Slot 0.015 Length 4.0 Set between 86.00 ft. and 90.00 ft. FITTINGS: <input checked="" type="checkbox"/> IX-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Tremie Check <input checked="" type="checkbox"/> Blank above screen 1.0 ft. Other			
BROWN CLAY & GRAVEL		10	30	8 STATIC WATER LEVEL: 20.00 ft. below land surface <input type="checkbox"/> Flow			
GRAY CLAY & GRAVEL		25	55	9 INHIBIT: 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.			
BROWN CLAY & GRAVEL		15	70	10 WELL HEAD: COMPLETION: <input checked="" type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit			
WET MUDY SAND & GRAVEL		13	83	11 WELL CROWDED: <input checked="" type="checkbox"/> No holes from to ft. 1 West cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other _____ No. of bags of cement Additives			
COARSE SAND & GRAVEL		7	90	12 HEAVIEST SOURCE OF POSSIBLE CONTAMINATION: Type: Septic Distance 70 ft. Direction SW Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged?			
15. Remarks, elevation, source of data, etc.		13. PUMP: <input type="checkbox"/> Not installed <input checked="" type="checkbox"/> 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: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet				14. PRESSURE TANK: Manufacturer's name _____ Model number Capacity 14 Gallons	
Data Source: MDNR		15. 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 _____	
17. Rig Operator's Name:		Signed _____				Date _____	
AUTHORIZED REPRESENTATIVE							

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 3974100302		C9		Tax Parcel #			
County KALAMAZOO	Township Name BRADY	Fraction SE 1/4 SW 1/4 SW 1/4	Section 03	Town 04 S	Range 10 W		
Distance And Direction From Road Intersection 2250' E OF 30TH AND 100' N OF H AVENUE 8171 H AVENUE, VICKSBURG 49097		1 OWNER OF WELL VALIAD, DOUGLAS Address 8171 H AVENUE VICKSBURG, MI 49097					
Street Address & City of Well Location		Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Locate with 'X' in Section Below		Sketch Map		4 WELL DEPTH: <input checked="" type="checkbox"/> 41.0 FT. <input type="checkbox"/> Date Completed 03/11/89 <input type="checkbox"/> New Well <input type="checkbox"/> Replacement Well			
				5 <input checked="" type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Driven <input type="checkbox"/> Bug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Jetted <input type="checkbox"/> Unknown			
				6 USE <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type II Public <input type="checkbox"/> Heat Pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type IIb Public			
ELEVATION 856.00 msl		7 CASTING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Plastic <input type="checkbox"/> Welded Diameter 4.00 in. to 36.0 ft. depth <input type="checkbox"/> Height: Above Surface 1.0 ft. 0.00 in. to 0.0 ft. depth <input type="checkbox"/> Weight lbs/ft.					
2 FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
SAND AND STONES		15	15				
GRAY CLAY		18	33				
WATER SAND		8	41				
				8 SCREEN <input type="checkbox"/> Not Installed type Plastic/PVC <input type="checkbox"/> Diameter 4.00 SLOT 0.012 <input type="checkbox"/> Length 5.0 Set between 36.00 ft. and 41.00 ft. FITTINGS: <input type="checkbox"/> Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Pressure Check <input type="checkbox"/> Blank above screen 1.0 ft. <input type="checkbox"/> Other			
				9 STATIC WATER LEVEL: 12.00 ft. below land surface <input type="checkbox"/> 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: <input checked="" type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit			
				12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes from to ft. <input type="checkbox"/> Mort cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement _____ Additives _____			
				13 Nearest source of possible contamination Type Unknown Distance 0 ft. Direction Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
				14 PUMP: <input type="checkbox"/> Not Installed <input checked="" type="checkbox"/> Pump Installation Only Manufacturer's name _____ Model number HP .5 Volts Length of Drop Pipe 21 ft. capacity 10 G.P.M. TYPE: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Jet PRESSURE TANK: Manufacturers name _____ Model number Capacity 10 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.				0436	
Data Source: MDNR		REGISTERED BUSINESS NAME _____				REGISTRATION NO. _____	
17. Rig Operator's Name:		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

page 1 of 1

1 LOCATION OF WELL	39741013001	111	Tax Parcel #
County	SHAMAZOO	Township Name	BRADY
Distance And Direction From Road Intersection 1800' N OF VM AND 100' W OF 36TH 13334 S 16TH STREET, VICKSBURG 49097		Fraction	NE 1/4 SE 1/4 NE 1/4
Street Address & City of Well location		Section	11
Locate with 'X' in Section Below		Sketch Map	
ELEVATION 922.00 msl			
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	91	
BLUE CLAY AND GRAVEL	3	84	
BROWN CLAY AND GRAVEL	3	87	
STONES AND GRAVEL	13	100	
LIGHT BROWN COARSE SAND & GRAVEL	17	117	
15. Remarks, elevation, source of data, etc.			
Data Source: MDNR			
17. Rig Operator's Name:			
18. 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.			
Address:		REGISTERED BUSINESS NAME	REGISTRATION NO.
Signed		AUTHORIZED REPRESENTATIVE	Date

This is an MDNR computer generated facsimile of a water well record submitted under PA 168 of 1978.
This is not a legal document.

WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL	39740918907	C12			Tax Parcel I																											
County	KALAMAZOO	Township Name	WAKESUMA	Fraction	NE 1/4	SE 1/4	Section	18	Town	04 S	Range	09 W																				
Distance And Direction From Road Intersection 2400' N OF W AND 50' W OF 38TH VICKSBURG 49097				3 OWNER OF WELL FAIR, DICK Address: 13558 38TH STREET VICKSBURG, MI 49097 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																												
Street Address & City of Well Location				4 WELL DEPTH: Date Completed: 05/25/88 <input type="checkbox"/> New Well <input type="checkbox"/> Replacement Well <input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted																												
Locate with 'X' in Section Below				Sketch Map																												
ELEVATION 910.00 msl				5 CASING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Plastic <input type="checkbox"/> Welded Height: Above Surface 1.0 ft. Diameter: 4.00 in. to 70.0 ft. depth <input type="checkbox"/> Weight lbs/ft. 3.00 in. to 80.0 ft. depth Ground Drill Hole Diameter: 0.00 in. to 0.0 ft. depth <input type="checkbox"/> Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No 0.00 in. to 0.0 ft. depth																												
<table border="1"> <thead> <tr> <th>2 FORMATION DESCRIPTION</th> <th>THICKNESS OF STRATUM</th> <th>DEPTH TO BOTTOM OF STRATUM</th> </tr> </thead> <tbody> <tr><td>BROWN CLAY</td><td>18</td><td>18</td></tr> <tr><td>GREY CLAY, SAND AND GRAVEL</td><td>10</td><td>28</td></tr> <tr><td>BROWN CLAY, SAND AND GRAVEL</td><td>16</td><td>44</td></tr> <tr><td>BROWN CLAY, STONES AND SAND AND GRAVEL</td><td>14</td><td>58</td></tr> <tr><td>GREY CLAY, SAND AND GRAVEL</td><td>8</td><td>66</td></tr> <tr><td>WATER SAND</td><td>14</td><td>80</td></tr> </tbody> </table>				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	6 SCREEN: <input type="checkbox"/> Not Installed Type: Stainless Steel Diameter: 3.00 SLOT: 0.015 Length: 10.0 Set between: 70.00 ft. and 80.00 ft. FITTINGS: <input checked="" type="checkbox"/> Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 5.0 ft. Other							
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																														
				7 STATIC WATER LEVEL: 12.00 ft. below land surface <input type="checkbox"/> Plow																												
				8 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.																												
				9 WELL HEAD COMPLETION: <input type="checkbox"/> Pitless adapter <input checked="" type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit																												
				10 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From to ft. <input type="checkbox"/> Metal cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement _____ Additives _____																												
				11 Nearest source of possible contamination Type: Septic Distance: 75 ft. Direction: NW Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																												
				12 PUMP: <input type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name: FLINT ADD Model number: HP 1 Volts Length of Drop Pipe: 42 ft. capacity: 19 G.P.M. TYPE: <input type="checkbox"/> Submersible <input checked="" type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name _____ Capacity: 19 Gallons																												
13. Remarks, elevation, source of data, etc.				13. Remarks, elevation, source of data, etc.																												
Data Source: MDNR				14. 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.																												
15. Rig Operator's Name:				15. Rig Operator's Name: <input type="checkbox"/> 1576 REGISTERED BUSINESS NAME: <input type="checkbox"/> REGISTRATION NO.: <input type="checkbox"/>																												
				Address: _____																												
				Signed: _____ Date: _____																												
				AUTHORIZED REPRESENTATIVE: _____																												

This is an MDNR computer generated facsimile of a water well record submitted under PA 168 of 1978.
This is not a legal document.

WATER WELL AND PUMP RECORD

Page 1 of 1

¹⁵ Remarks about the nature of data etc.

Data Source: BLS

117. *Polytmus guadalupensis*

This is an NLR computer generated facsimile of a document record submitted under DIA 108 of 1952.
It does not contain any original handwriting.

1794
REGISTERED BUSINESS NAME REGISTRATION NO.

1. **MAN-MADE POLYMERIZATION** (Part I)

WATER WELL AND PUMP RECORD

This is the 1978-1979 general ledger of a water well record selected under D.L. 168 of 1978.
There is no legal document.

WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL	103	TAX LEVEL					
County	Franklin	Section	24	Block	018	Range	12 R.
Address	103 W. Main St.						
Distance from location from road intersection							
1.35 miles NW, Franklin, Pa.							
Street Address or Name of Well Location							
Nearest town NW in section block				Mile 3.25			
ELEVATION: 507.00 ft.							
2 FORMATION DESCRIPTION	thickness of strata	DEPTH TO bottom of stratum	3	4	5	6	7
COARSE SAND & GRAVEL	2'	4'					
SAND & GRAVEL (water)	3'	50'					
BEDDING CLAY AND GRAVEL	4'	140'					
COARSE SAND	8'	113'					
8. MARKS OF CONSTRUCTION DATA, etc. PPM#17-0071							
9. DATA SOURCE: PWD							
10. BY OPERATOR'S NAME:							
11. REGISTERED 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							
State				Title			
AUTHORIZED REPRESENTATIVE							

This is an EDR computer generated copy of a water well record submitted under Act 12 of 1973, Pennsylvania Dept. of Environmental Resources

This is an **80:90** computer-generated facsimile of a handwritten document under the **80:82** of 1-32.
This is not a legal record.

WATER WELL AND PUMP RECORD

135

¹⁵ Remarks about the source of data etc.

Data Source: MINER

17. Big Operator's Box

This is an MPP computer generated facsimile of a water well record submitted under PA 508 of 1972.
This is not a legal document.

WATER WELL AND PUMP RECORD

This is an NPP computer-generated facsimile of a voter roll record submitted under EA 368 of 1978.
This is a test record.

WATER WELL AND PUMP RECORD

100-1-51

Location of Well		W71220007	E1	Ex Parte I			
County	Parham	Township Name	177AS	Section	26	Town	03 S
Latitude And Longitude From Plat Index Sheet 67° 5' 0" N 88° 40' 60" W				Range	12 E		
PS NUMBER: 2111202-0100							
Street Address & City of Well Location							
Lat. with 'E' in Section Below				Section Line			
ELEVATION 915.00 ft.							
FORMATION MISCELLANEOUS							
THICKNESS OF SEDIMENT	BEDDING TYPE OR STRUCTURE	SEDIMENT TYPE OR STRUCTURE	SEDIMENT TYPE OR STRUCTURE	SEDIMENT TYPE OR STRUCTURE	SEDIMENT TYPE OR STRUCTURE	SEDIMENT TYPE OR STRUCTURE	SEDIMENT TYPE OR STRUCTURE
TOP SOIL							
MEDIUM SAND AND GRAVEL MUD	16						
MEDIUM SAND WITH LITTLE GRAVEL	10						
CEMENTED SAND AND LITTLE CLAY	7						
FINE SAND	25						
MEDIUM SAND AND GRAVEL	41						
MEDIUM SAND	10						
GRAY CLAY WITH LITTLE GRAVEL	15						
COARSE SAND AND GRAVEL	6						
FINE Muddy SAND AND GRAVEL	17						
MEDIUM SAND	2						
COARSE SAND AND GRAVEL	1						
GRAY CLAY WITH SAND AND GRAVEL	3						
FINE SAND	11						
GRAY CLAY WITH SAND	19						
SALT CLAY AND CLAY	22						
DIR	28						
15. Remarks, drilling rig, source of information							
Data Source: MDRR							
16. Rig Operator's Name:							

¹⁵ See the citations given at note 13.

DEPARTMENT OF DEFENSE CONTRACTOR'S CERTIFICATION
I hereby certify under my knowledge and belief,
that all was carried out by my organization and the equipment
supplied to the best of my knowledge and belief.

Data Source: BNPB

REGISTERED BUSINESS NAME

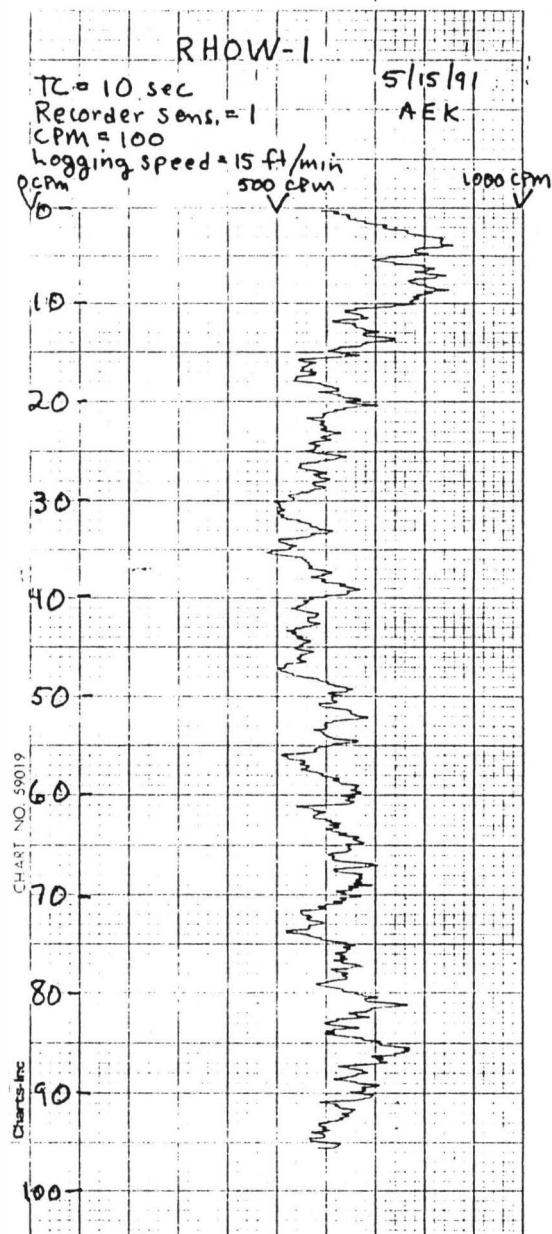
17. Big Data's Impact

This is a full computer generated forecast for a winter cell record submit. Update PM 03 of 170, 1000Z 10 Dec 2010.

WATER WELL AND PUMP RECORD

LOCATION OF WELL		073141.00		E2		Permit No.		Permit Type	
County	Section	Latitude	Longitude	Block	Well No.	Section	Block	Permit No.	Permit Type
Sumner				1	174	SE 1/4	SW 1/4	1	1
Geological And General Data From Well Description									
WELL NO. 1118-1 City of Dresser, City of Zumbrota									
Depth with 10' in Section Line		Sect. Line							
ELEVATION 890.20 (gs)									
FORMATION DESCRIPTION		THICKNESS OF SECTION	DEPTH OF SECTION FROM SURFACE	GEOL. DATA BETWEEN STATIONS		GEOL. DATA BETWEEN STATIONS		GEOL. DATA BETWEEN STATIONS	
Top		1							
Bottom		2							
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Bottom		5							
Bottom		6							
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The document has been signed electronically.



WATER WELL AND PUMP RECORD

LOCATION OF WELL		174101017		E3		Faceted 1	
County	Township Name	Section	Range	Section	Range	Section	Range
Kosciusko	SCHUYLER	SE 1/4	SE 1/4	SW 1/4	SW 1/4	SW 1/4	SW 1/4
Address and Description from Record Information 2700' W. OF VORTAGE AVE. 360' S. E. 1/2 H Avenue, Schuyler, HI 61937							
Street Address & City of Well Location							
Locate with 1/4 in Section Below		Grid Reference					
ELEVATION 874.00 ±							
FORMATION DESCRIPTION		MIN. DEPTH	MAX. DEPTH	MIN. DEPTH	MAX. DEPTH	Height: Max.	
		ft	ft	ft	ft	ft	
SAND, SOME FINE		5	5	4.00 in.	4.00 in.	Surface	2.0 ft.
GRAVEL, MED. A LITTLE SAND MED TO FINE		10	9	0.00 in.	0.00 in.	Weight	Heavy
BOULDER AT 43 FT				0.00 in.	0.00 in.	Bottom	
CLAY, GRAY, STONE		6	7	0.00 in.	0.00 in.	Length	14.0
CLAY, GRAY, A LITTLE GRAVEL		11	10	0.00 in.	0.00 in.	Size between	130.0 ft. and 190.0 ft.
SAND, FINE		7	9	0.00 in.	0.00 in.	FILTERS:	1) Blanket 2) Sand Filter 3) Screen Check
GRAVEL, FINE TO MED.		12	13	0.00 in.	0.00 in.	1) Blank above screen	0.0 ft. Other
GRAVEL, MED. TO COARSE		8	10	0.00 in.	0.00 in.		
GRAVEL, FINE TO MED. A LITTLE SAND		9	10	0.00 in.	0.00 in.		
GRAVEL, FINE A LITTLE SAND MED TO FINE		13	14	0.00 in.	0.00 in.		
GRAVEL, MED. A LITTLE SAND, BOULDER AT 177		14	15	0.00 in.	0.00 in.		
GRAVEL, MED. WITHES OF BLACK SHALE, SOFT		15	16	0.00 in.	0.00 in.		
15. Results of drilling or completion (if any)							
Data Source: MDR							
17. Rig Operator's Name:							
18. WELL DRILLED UNDER MY DIRECTION AND THIS REPORT IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF.							
REGISTERED BUSINESS NAME				REGISTRATION NO.			
Firma				100			
Rep. #				AUTHORIZED REPRESENTATIVE			

This is an MDR computer generated record of a water well record submitted under 1A-168 of 1978.
This record is kept permanent.

WATER WELL AND PUMP RECORD

1100 1111

Location of Well		1524101010	See Part I	
County	KAMIAZOO	Touching Townships		
		SUPERIOR		
Address and Name, Chain Filing Plat Information 2000' W of 23 Ave 2000' N of 4 2101 E 10 Ave, SODILOPE, 49887 Superior Airlines, A City of Well Location				
Locate with 'X' in Section Below		Section No.		
ELEVATION 868.00 (ft)				
FORMATION DESCRIPTION		DEPTH	TYPE	DESCRIPTION
1	TOP SAND	0	1	Steel
2	MID SAND	15	1	Plastic
3	SOFT GRAY CLAY	35	1	Welded
4	COARSE SAND	50	1	Brass
5		60	1	Brass
6		70	1	Brass
7		80	1	Brass
8		90	1	Brass
9		100	1	Brass
10		110	1	Brass
11		120	1	Brass
12		130	1	Brass
13		140	1	Brass
14		150	1	Brass
15		160	1	Brass
16		170	1	Brass
17		180	1	Brass
18		190	1	Brass
19		200	1	Brass
20		210	1	Brass
21		220	1	Brass
22		230	1	Brass
23		240	1	Brass
24		250	1	Brass
25		260	1	Brass
26		270	1	Brass
27		280	1	Brass
28		290	1	Brass
29		300	1	Brass
30		310	1	Brass
31		320	1	Brass
32		330	1	Brass
33		340	1	Brass
34		350	1	Brass
35		360	1	Brass
36		370	1	Brass
37		380	1	Brass
38		390	1	Brass
39		400	1	Brass
40		410	1	Brass
41		420	1	Brass
42		430	1	Brass
43		440	1	Brass
44		450	1	Brass
45		460	1	Brass
46		470	1	Brass
47		480	1	Brass
48		490	1	Brass
49		500	1	Brass
50		510	1	Brass
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64		650	1	Brass
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67		680	1	Brass
68		690	1	Brass
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70		710	1	Brass
71		720	1	Brass
72		730	1	Brass
73		740	1	Brass
74		750	1	Brass
75		760	1	Brass
76		770	1	Brass
77		780	1	Brass
78		790	1	Brass
79		800	1	Brass
80		810	1	Brass
81		820	1	Brass
82		830	1	Brass
83		840	1	Brass
84		850	1	Brass
85		860	1	Brass
86		870	1	Brass
87		880	1	Brass
88		890	1	Brass
89		900	1	Brass
90		910	1	Brass
91		920	1	Brass
92		930	1	Brass
93		940	1	Brass
94		950	1	Brass
95		960	1	Brass
96		970	1	Brass
97		980	1	Brass
98		990	1	Brass
99		1000	1	Brass
100		1010	1	Brass
101		1020	1	Brass
102		1030	1	Brass
103		1040	1	Brass
104		1050	1	Brass
105		1060	1	Brass
106		1070	1	Brass
107		1080	1	Brass
108		1090	1	Brass
109		1100	1	Brass
110		1110	1	Brass
111		1120	1	Brass
112		1130	1	Brass
113		1140	1	Brass
114		1150	1	Brass
115		1160	1	Brass
116		1170	1	Brass
117		1180	1	Brass
118		1190	1	Brass
119		1200	1	Brass
120		1210	1	Brass
121		1220	1	Brass
122		1230	1	Brass
123		1240	1	Brass
124		1250	1	Brass
125		1260	1	Brass
126		1270	1	Brass
127		1280	1	Brass
128		1290	1	Brass
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133		1340	1	Brass
134		1350	1	Brass
135		1360	1	Brass
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137		1380	1	Brass
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142		1430	1	Brass
143		1440	1	Brass
144		1450	1	Brass
145		1460	1	Brass
146		1470	1	Brass
147		1480	1	Brass
148		1490	1	Brass
149		1500	1	Brass
150		1510	1	Brass
151		1520	1	Brass
152		1530	1	Brass
153		1540	1	Brass
154		1550	1	Brass
155		1560	1	Brass
156		1570	1	Brass
157		1580	1	Brass
158		1590	1	Brass
159		1600	1	Brass
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163		1640	1	Brass
164		1650	1	Brass
165		1660	1	Brass
166		1670	1	Brass
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186		1870	1	Brass
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193		1940	1	Brass
194		1950	1	Brass
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196		1970	1	Brass
197		1980	1	Brass
198		1990	1	Brass
199		2000	1	Brass
200		2010	1	Brass
201		2020	1	Brass
202		2030	1	Brass
203		2040	1	Brass
204		2050	1	Brass
205		2060	1	Brass
206		2070	1	Brass
207		2080	1	Brass
208		2090	1	Brass
209		2100	1	Brass
210		2110	1	Brass
211		2120	1	Brass
212		2130	1	Brass
213		2140	1	Brass
214		2150	1	Brass
215		2160	1	Brass
216		2170	1	Brass
217		2180	1	Brass
218		2190	1	Brass
219		2200	1	Brass
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221		2220	1	Brass
222		2230	1	Brass
223		2240	1	Brass
224		2250	1	Brass
225		2260	1	Brass
226		2270	1	Brass
227		2280	1	Brass
228		2290	1	Brass
229		2300	1	Brass
230		2310	1	Brass
231		2320	1	Brass
232		2330	1	Brass
233		2340	1	Brass
234		2350	1	Brass
235		2360	1	Brass
236		2370	1	Brass
237		2380	1	Brass
238		2390	1	Brass
239		2400	1	Brass
240		2410	1	Brass
241		2420	1	Brass
242		2430	1	Brass
243		2440	1	Brass
244		2450	1	Brass
245		2460	1	Brass
246		2470	1	Brass
247		2480	1	Brass
248		2490	1	Brass
249		2500	1	Brass
250		2510	1	Brass
251		2520	1	Brass
252		2530	1	Brass
253		2540	1	Brass
254		2550	1	Brass
255		2560	1	Brass
256		2570	1	Brass
257		2580	1	Brass
258		2590	1	Brass
259		2600	1	Brass
260		2610	1	Brass
261		2620	1	Brass
262		2630	1	Brass
263		2640	1	Brass
264		2650	1	Brass
265		2660	1	Brass
266		2670	1	Brass
267		2680	1	Brass
268		2690	1	Brass
269		2700	1	Brass
270		2710	1	Brass
271		2720	1	Brass
272		2730	1	Brass
273		2740	1	Brass
274		2750	1	Brass
275		2760	1	Brass
276		2770	1	Brass
277		2780	1	Brass
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279		2800	1	Brass
280		2810	1	Brass
281		2820	1	Brass
282		2830	1	Brass
283		2840	1	Brass
284		2850	1	Brass
285		2860	1	Brass
286		2870	1	Brass
287		2880	1	Brass
288		2890	1	Brass
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298		2990	1	Brass
299		3000	1	Brass
300		3010	1	Brass
301		3020	1	Brass
302		3030	1	Brass
303		3040	1	Brass
304		3050	1	Brass
305		3060	1	Brass
306		3070	1	Brass
307		3080	1	Brass
308		3090	1	Brass
309		3100	1	Brass
310		3110	1	Brass
311		3120	1	Brass
312		3130	1	Brass
313		3140	1	Brass

15. From historical sources of data

Data Source: MDCP

112. Pig Operator's Name:

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012

WATER WELL AND PUMP RECORD

1 LOCATION OF WELL	107-1007001		YES	RECORDED
County	Laramie		Block	Page
Address And Telephone		100 E 6TH ST, Laramie, WY 82040		
Business And Home		100 E 6TH ST, Laramie, WY 82040		
Street Address & City of Well Location				
Locate with "X" on Section Below		Section Map		
		ELEVATION 859.00 ft		
2 ELEVATED SUSPENSION		THICKNESS OF SCREEN	DEPTH TO SCREEN	3 PUMPING
BROWN CLAY & GRAVEL		25	25	[<input type="checkbox"/>] Steel [<input type="checkbox"/>] Threaded [<input type="checkbox"/>] Plastic [<input type="checkbox"/>] Welded height: 10 ft.
WET SAND AND GRAVEL		15	19	4.00 in. to 100.0 ft. depth weight: lbs/ft. 0.00 in. to 0.0 ft. 1.15 Grained Drill Hole diameter: 3.00 in. to 0.0 ft. depth 0.00 in. to 0.0 ft. depth
GRAY CLAY & GRAVEL		10	56	5 SCREEN [<input type="checkbox"/>] Not Installed Type: Screen diameter: 0.00 Dish: 0.000 length: 0.0 Set between: 0.00 ft. and 0.00 ft.
WET MUDY SAND		5	58	6 FITTINGS: 1. Head Fitter 1. Head Fitter 1. Blank above screen 0.0 ft. other
GRAY CLAY & GRAVEL		5	60	7 PUMP: 1. Pump type: 1. Pump 1. Pumping rate: 0.0 G.P.M. 1. Pumping rate: 0.0 G.P.M.
WET MUDY SAND		5	62	8 WELL HEAD: 1. Well head surface 1. Well head surface
BROWN CLAY CLAY		100	126	9.00 in. to 100.0 ft. depth 1. Flow
				10 PUMPING LEVEL: below Land surface 0.00 ft. or 0.0 ft. suspending air 0.0 ft. 0.00 ft. or 0.0 ft. suspending air 0.0 ft.
				11 WELL HEAD COMPLETION: 1. Drillless完井 1. 102% down hole 1. Drillless完井 1. Improved pH
				12 WELL GROUTED: 1. Drillless完井 1. 0.0 ft. 1. Drillless完井 1. 0.0 ft. No. of bags of cement: 200 bags
				13 REAREST source of possible contamination: Type: Unknown distance: 0.0 ft. location: Well disinfected upon completion? 1. Yes 1. No Was old well plugged? 1. Yes 1. No
				14 PUMP: 1. Model: 1. Pump Installation Only Manufacturer's name: 1. 100 Model number: 1. 100 Length of pump pipe: 0 ft. capacity: 0 G.P.M. Type: 1. Submersible Filter DISCHARGE PIPE: Manufacturer's name: 1. 100 Model number: 1. 100 Length: 0 ft.
15. Works elevation, name of driller, etc.		15. WELL EQUIPMENT OPERATOR: This well is drilled under contract by him. This report is based on the best of my knowledge and belief.		
16. Driller's Name:		REGISTERED BUSINESS NAME		
17. Driller's Name:		REGISTERED ADDRESS		
		AUTHORIZED REPRESENTATIVE		
		Title		

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WATER WELL AND PUMP RECORD

Form 1-1

LOCATION OF WELL	07410005	E 7			Location	SW 1/4 SE 1/4 NW 1/4	Section	15	16 S	10 W
County	Franklin	Wells per acre	2000		Owner of well	John G. Smith				
Address	100 E 111 St., Apt. 300, New York, N.Y. 10036	Address	100 E 111 St., Apt. 300, New York, N.Y. 10036							
Street & town or city of well location	100 E 111 St., Apt. 300, New York, N.Y. 10036	Address same as well location?	Yes	No						
Locate with "X" on sketch below				Sketch Map	1. WELD, DAWSON	1. Hole cased to bedrock	1. 10 ft. well			
					10 ft. 0 in.	12/00/70	1. Depth to bedrock 10 ft.			
					2. 1. Cased to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					2. 2. Cased to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					3. 1. Drilled to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					3. 2. Drilled to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					4. 1. Drilled to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					4. 2. Drilled to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					5. 1. Drilled to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					5. 2. Drilled to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					6. 1. Drilled to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					6. 2. Drilled to bedrock	1. 10 ft. well	1. Depth to bedrock 10 ft.			
					7. 1. Casing	1. Steel	1. Threaded	1. Weight 300 lbs.		
					7. 2. Casing	1. Plastic	1. Welded	1. Weight 300 lbs.		
					8. 1. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					8. 2. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					9. 1. Screen	1. 10 ft. 0 in.	1. Length 0 ft.			
					9. 2. Screen	1. 10 ft. 0 in.	1. Length 0 ft.			
					10. 1. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					10. 2. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					11. 1. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					11. 2. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					12. 1. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					12. 2. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					13. 1. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					13. 2. Filter	1. 10 ft. 0 in.	1. Length 0 ft.			
					14. 1. Pump	1. 10 ft. 0 in.	1. Length 0 ft.			
					14. 2. Pump	1. 10 ft. 0 in.	1. Length 0 ft.			
					15. 1. Pump	1. 10 ft. 0 in.	1. Length 0 ft.			
					15. 2. Pump	1. 10 ft. 0 in.	1. Length 0 ft.			
16. Remarks: (Location, source of discharge, etc.)										
17. Well has been drilled for water supply and this report is true to the best of my knowledge and belief.										
18. Water Source: River										
19. Rig Operator's Name:										
20. Registered Address: 100 E 111 St., Apt. 300, New York, N.Y. 10036										
21. M.R. No.: 100										
22. M.R. Date: 12/00/70										

This is an RDS computer generated form and is valid until November 16, 1973.

WATER WELL AND PUMP RECORD

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WATER WELL AND PUMP RECORD

page 1 of 2

1 LOCATION OF WELL	39741204100	F1	Tax Parcel I
County	KALAMAZOO	Township Name	PRairie Ronde
		Fraction	SE 1/4 NE 1/4 NW 1/4
		Section	04
		Town	04 S
		Range	12 W
Distance And Direction From Road Intersection PAN PAN 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 902.00 msl			
2 FORMATION DESCRIPTION	THICKNESS	DEPTH TO BOTTOM OF STRATUM	
SOFT BROWN CLAY & GRAVEL	5	5	
COARSE GRAVEL (WATER)	20	25	
COARSE CEMENTED GRAVEL	5	30	
PPR GRAVEL & CORDIES	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	
15. Remarks, elevation, source of data, etc. CASING PULLED BACK TO 178'; SCREEN SET BETWEEN 174 AND 178			
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.			
Data Source: Michigan Groundwater Survey		REGISTERED BUSINESS NAME: 0112 Address:	
17. Rig Operator's Name:		SIGNATURE: _____ AUTHORIZED REPRESENTATIVE: _____ Date: _____	

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL	39741202100	F2	Tax Parcel 1			
County	KALAMAZOO	Township Name PRAIRIE RONDE	Fraction SW 1/4 SE 1/4 SW 1/4	Section 02	Town 04 S	Range 12 N
Distance And Direction From Road Intersection 6500 WEST M AVE. EAST OF EXISTING HOME WELL SA-25, SCHOLCRAFT Street Address & City of Well Location			OWNER OF WELL Address WESTERN MICHIGAN UNIVERSITY GEOLOGY DEPT. KALAMAZOO, MI 49007 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Locate with '1' in Section Below			Sketch Map			
			1 WELL DEPTH: 200.0 FT.	Date Completed 01/31/90	<input checked="" type="checkbox"/> New Well <input type="checkbox"/> Replacement Well	
			5 <input checked="" type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored	<input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Jetted		
			6 USE <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type II Public <input checked="" type="checkbox"/> Test Well <input type="checkbox"/> Type III Public <input type="checkbox"/> Real Pump			
			7 CASTING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Plastic <input checked="" type="checkbox"/> Threaded <input type="checkbox"/> Welded	Height: Above Surface 1.0 ft.		
			Diameter 4.00 in. to 14.0 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.		
			8 SCREEN Type Stainless Steel SLOT 15,000 Set between 146.00 ft. and 150.00 ft.	Diameter 4.00 Length 4.0		
			FITTINGS: <input checked="" type="checkbox"/> K-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 1.0 ft. <input type="checkbox"/> Other			
			9 STATIC WATER LEVEL: 15.00 ft. below land surface	11 PLOW		
			10 PUMPING LEVEL: below land surface 15 ft. after 1.0 hrs. pumping at 50 G.P.M. 0 ft. after 0.8 hrs. pumping at 0 G.P.M.			
			11 WELL HEAD COMPLETION: <input checked="" type="checkbox"/> Pillars adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit			
			12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From to ft. I Meat cement <input type="checkbox"/> bentonite <input type="checkbox"/> Other No. of bags of cement _____ Additives _____			
			13 NEAREST SOURCE OF POSSIBLE CONTAMINATION Type Septic Distance 150 ft. Direction SW Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
			14 PUMP: <input checked="" type="checkbox"/> No installed <input type="checkbox"/> Pump Installation Only Manufacturer's name _____ Model number RP Volts _____ Length of Drop Pipe 0 ft. capacity 0 G.P.M. TYPE: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturers name _____ Model number Capacity 0 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.			
Data Source: Michigan Groundwater Survey			Address	REGISTERED BUSINESS NAME OIL2	REGISTRATION NO.	
17. Rig Operator's Name:			Signed	AUTHORIZED REPRESENTATIVE	Date	

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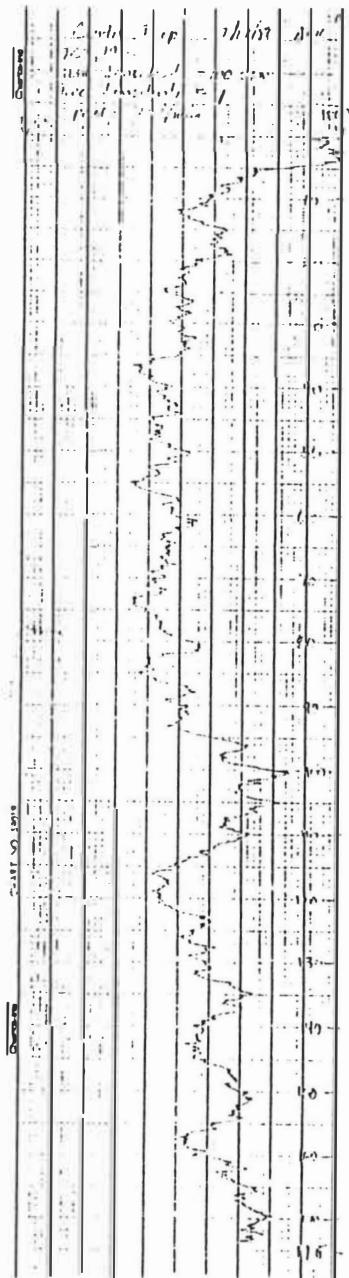
WATER WELL AND PUMP RECORD

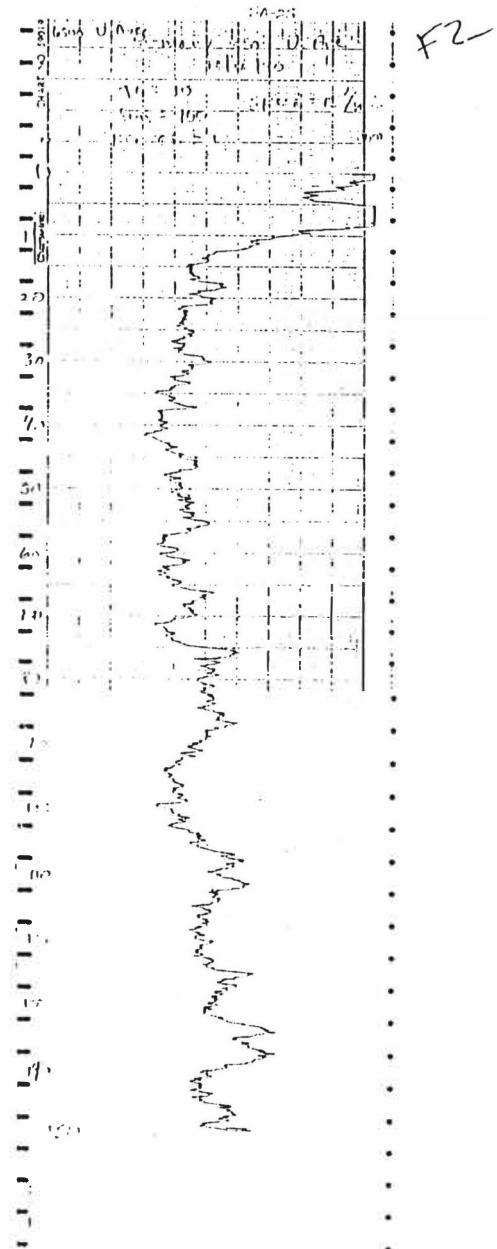
page 2 of 2

1 LOCATION OF WELL	3974120 100	F2	Tax Parcel #
County KALAMAZOO	Township Name TRAILER RONDE	Fraction SE 1/4 NE 1/4 NW 1/4	Section 04 Town 04 S Range 12 N
Distance And Direction From Road Intersection PAN PAN LAKE RD. 1/4 MILE EAST OF 4TH ST. ON N. SIDE OF WELL STA-1, Street Address & City of Well Location			
Locate with 'I' in Section Below	Sketch Map		
ELEVATION 903.00 psi			
2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	
HARD GRAY CLAY & GRAVEL	28	228	
CASING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded Height: Above Surface 1.0 ft.			
Diameter 4.00 in. to 174.0 ft. depth Weight lbs/ft. 0.00 in. to 0.0 ft. depth Grouted Drill Hole Diameter Drive Shoe <input checked="" type="checkbox"/> Yes 0.00 in. to 0.0 ft. depth <input type="checkbox"/> No 0.00 in. to 0.0 ft. depth			
SCREEN <input type="checkbox"/> Not Installed Type Stainless Steel Diameter 4.00 SLOT 0.070 Length 4.00 Set between 174.00 ft. and 178.00 ft. FITTINGS: <input checked="" type="checkbox"/> K-Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Bremer Check <input checked="" type="checkbox"/> Blank above screen 1.0 ft. Other			
9 STATIC WATER LEVEL: 10.00 ft. below land surface <input checked="" type="checkbox"/> Flow			
10 PUMPING LEVEL: below land surface <input checked="" type="checkbox"/> 0 ft. after 1.0 hrs. pumping at 50 G.P.M. <input type="checkbox"/> 0 ft. after 8.0 hrs. pumping at 0 G.P.M.			
11 WELL HEAD COMPLETION: <input checked="" type="checkbox"/> Pitless adapter <input checked="" type="checkbox"/> 1/2" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit			
12 WELL GROUTED? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes From to ft. <input type="checkbox"/> Mortar <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement Additives			
13 Recent source of possible contamination Type None Distance 0 ft. Direction Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
14 PUMP: <input checked="" type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name Model number MP Volts length of Drop Pipe 0 ft. Capacity 0 G.P.M. TYPE: <input checked="" type="checkbox"/> Submersible <input type="checkbox"/> 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			
16 MAJOR WELL CONTRACTOR'S CERTIFICATION: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.			
Data Source: Michigan Groundwater Survey		0112 REGISTERED BUSINESS NAME Address	REGISTRATION NO.
17. Rig Operator's Name:		Signed	Date
AUTHORIZED REPRESENTATIVE			

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F2.





WATER WELL AND PUMP RECORD

page 1 of 1

F3

Tax Parcel #

1 LOCATION OF WELL	39741118002	F3	TAX PARCEL #
County	KALAMAZOO	Township Name	SCHOOLCRAFT
		Fraction	SW 1/4 SE 1/4 NW 1/4 NE 1/4
		Section	10
		Town	04 S
		RANGE	W
Distance And Direction From Road Intersection 600' N OF LYON AND 1050' W OF US 131 SCHOOLCRAFT 49087		1 OWNER OF WELL VILLAGE OF SCHOOLCRAFT Address SCHOOLCRAFT, MI 49087 Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Street Address & City of Well Location		2 WELL DEPTH: <input type="checkbox"/> Date Completed <input checked="" type="checkbox"/> New Well 250.0 FT. <input checked="" type="checkbox"/> 08/11/07 <input type="checkbox"/> Replacement Well	
Locate with 'X' in Section Below		3 SKETCH MAP 	
		4 CABLE TOOL <input type="checkbox"/> ROTARY <input checked="" type="checkbox"/> DRIVEN <input type="checkbox"/> DUG <input type="checkbox"/> HOLLOW ROD <input type="checkbox"/> AUGER/BORED <input type="checkbox"/> JETTED	
		5 USE: <input type="checkbox"/> DOMESTIC <input type="checkbox"/> TYPE I PUBLIC <input type="checkbox"/> IRRIGATION <input type="checkbox"/> TYPE II PUBLIC <input type="checkbox"/> TYPE III PUBLIC <input type="checkbox"/> FARM WELL <input type="checkbox"/> TYPE IIb PUBLIC <input type="checkbox"/> HEAT PUMP	
		6 CASING: <input type="checkbox"/> STEEL <input type="checkbox"/> PLASTIC <input type="checkbox"/> THREADED <input type="checkbox"/> WELDED DIAMETER: 4.06 IN. TO 162.0 FT. DEPTH 0.00 IN. TO 0.0 FT. DEPTH GROUTED DRILL HOLE DIAMETER: 0.00 IN. TO 0.0 FT. DEPTH 0.02 IN. TO 0.0 FT. DEPTH HEIGHT: ABOVE SURFACE 0.0 FT. WEIGHT: ____ LBS/FT.	
		7 DRIVE SHOE: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
		8 SCREEN: <input type="checkbox"/> NOT INSTALLED TYPE: STAINLESS STEEL DIAMETER: 4.00 SLOR: 0.050 LENGTH: 3.0 SET BETWEEN: 162.00 FT. AND 165.00 FT.	
		9 FITTINGS: <input type="checkbox"/> JK-PACKER <input type="checkbox"/> THREAD PACKER <input type="checkbox"/> BREMNER CHECK <input type="checkbox"/> BLANK ABOVE SCREEN 0.0 FT. OTHER	
		10 STATIC WATER LEVEL: 11.00 FT. BELOW LAND SURFACE <input type="checkbox"/> FLOW	
		11 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.	
		12 WELL HEAD COMPLETION: <input type="checkbox"/> PILLENS ADAPTER <input type="checkbox"/> 112" ABOVE GRADE <input type="checkbox"/> BASEMENT OUTLET <input type="checkbox"/> APPROVED PIT	
		13 NEAREST SOURCE OF POSSIBLE CONTAMINATION TYPE: UNKNOWN DISTANCE: 0 FT. DIRECTION: WELL DISINFECTED UPON COMPLETION? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO WAS OLD WELL PLUGGED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
		14 PUMP: <input type="checkbox"/> NOT INSTALLED <input type="checkbox"/> IRIMP INSTALLATION ONLY MANUFACTURER'S NAME: RP VOLTA MODEL NUMBER: 0 LENGTH OF DROP PIPE: 0 FT. CAPACITY: 0 G.P.M. TYPE: 1 SUBMERIDABLE <input type="checkbox"/> JET	
		15 PRESSURE TANK: MANUFACTURER'S NAME: <input type="checkbox"/> MODEL NUMBER: <input type="checkbox"/> CAPACITY: 0 GALLONS	
16. REMARKS, ELEVATION, SOURCE OF DATA, ETC.		17. REGISTERED BUSINESS NAME: 1250 REGISTRATION RD.	
Data Source: MDNR		Address:	
17. Rig Operator's Name:		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

page 2 of 2

39741118002 | F3

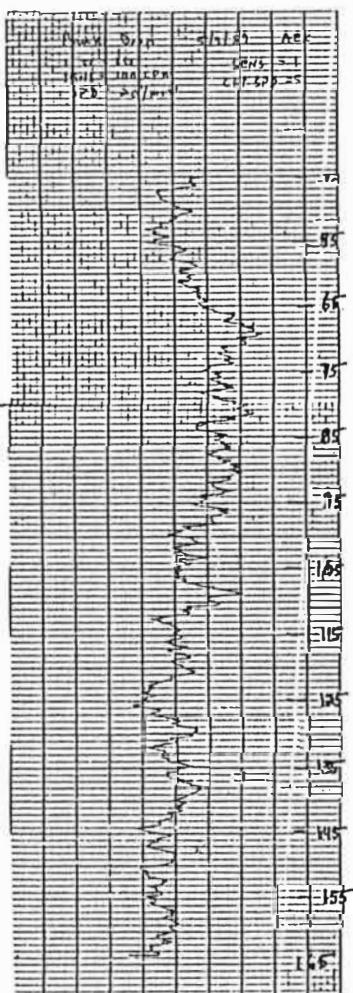
Tax Parcel I

LOCATION OF WELL	39741118002	Fraction SW 1/4 SE 1/4 NW 1/4	Section 18	Town 04 S	Range 11 W
County KALAMAZOO	Township Name SCHOOLCRAFT				
Distance And Direction From Road Intersection 600' N OF LYON AND 1050' W OF US 131 SCHOOLCRAFT 49087 Street Address & City of Well Location			OWNER OF WELL VILLAGE OF SCHOOLCRAFT Address SCHOOLCRAFT, MI 49087 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Locate with 'I' in Section Below			Sketch Map		
ELEVATION 800.00 nsf					
2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	CASTING: <input type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded Height: Above Surface 0.0 ft. Diameter 4.00 in. to 162.0 ft. depth Weight lbs/ft. 0.00 in. to 0.0 ft. depth Ground Drill Hole Diameter Drive Shoe <input type="checkbox"/> Yes 0.00 in. to 0.0 ft. depth <input type="checkbox"/> No 0.00 in. to 0.0 ft. depth		
GRAY CLAY	1	199			
GRAY SANDY CLAY, SOME GRAVEL	2	201			
HARD GRAY CLAY, SOME GRAVEL	20	221			
HARD GRAY SLICK(OILY) CLAY-COLUMBIAN SHALE	29	250			
			SCREEN Type Stainless Steel Diameter 4.00 SLOT 0.050 Length 3.0 Set between 162.00 ft. and 205.00 ft. FITTINGS: <input type="checkbox"/> Jet-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Breacher Check <input type="checkbox"/> Blank above screen 0.0 ft. Other		
			STATIC WATER LEVEL: 13.00 ft. below land surface <input type="checkbox"/> Flow		
			10 PUMPING LEVEL: below land surface <input type="checkbox"/> After 0.0 hrs pumping at 0 G.P.M. <input type="checkbox"/> After 0.0 hrs pumping at 0 G.P.M.		
			11 WELL HEAD COMPLETION: <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement outlet <input type="checkbox"/> Approved pit		
			12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From To ft. <input type="checkbox"/> Mort cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement Additives		
			13 Nearest source of possible contamination Type Unknown Distance 0 ft. Direction Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged?		
			14 PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump Installation Only Manufacturer's name _____ Model number RP Volts _____ Length of Drop Pipe 0 ft. capacity 0 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet MANUFACTURER'S NAME: _____ Model number Capacity 0 Gallons		
15. Remarks, elevation, source of data, etc.					
Data Source: MDNR					
17. Rig Operator's Name:					
Address			REGISTERED BUSINESS NAME REGISTRATION NO. 1250		
Signed			AUTHORIZED REPRESENTATIVE Date		

This is an MDNR computer generated facsimile of a water well record submitted under PA 360 of 1970.
This is not a legal document.

Foll Name Basslee (Schoolcraft Cemetery - Dorr Well) SN-9
Location NW 1/4, SE 1/4, NW 1/4, SEC 12, TYS, R12W
Date 5/9/69 Operator AEK
Time Constant 10 Sensitivity (cpm) 10.0
Speed 20/min Chart Sensitivity 1
Chart Speed 5

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WATER WELL AND PUMP RECORD

Form 1-1

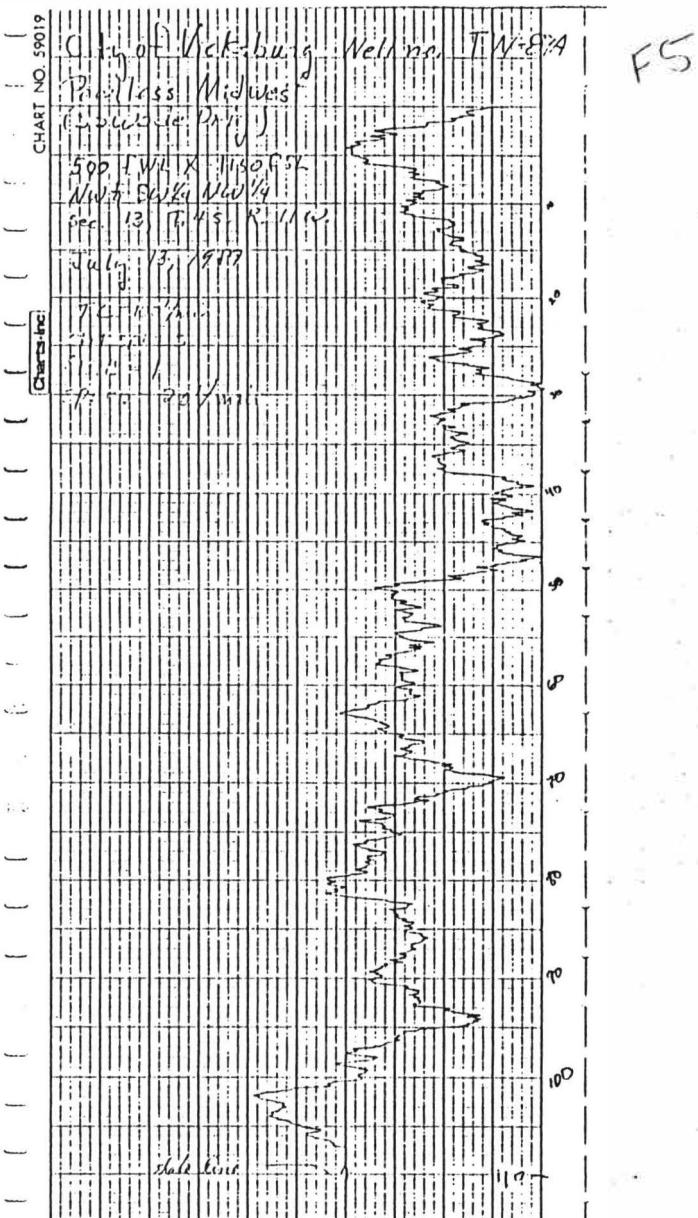
LOCATION OF WELL	1974010501	F4	For Panel 1			
County PARISHES	Township SPRINGDALE		Section	05	Block	118
Distance And Direction From Road Intersection SOUTH OF PART XEN. HALL CROSSING OF 9M AVE AND 10TH ST. STEVENS			Location of Well VILLAGE OF SPRINGDALE SPRINGDALE, Address Elevated Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
Street Address & City of Well Location			Date Completed 07/31/70 <input type="checkbox"/> New Well <input checked="" type="checkbox"/> Replacement Well			
Circle with "X" in Section Boxes			Type 1. Cased Well <input type="checkbox"/> 2. Rotary <input type="checkbox"/> 3. Drilled <input type="checkbox"/> 2. Unlined Well <input type="checkbox"/> 4. Auger/Perc <input type="checkbox"/> 5. Dug 6. Horizontal <input type="checkbox"/> 7. Horizontal <input type="checkbox"/> 8. Vertical <input type="checkbox"/> 9. Drill Well <input type="checkbox"/> 10. Horizontal <input type="checkbox"/>			
ELEVATION 850.00 ss						
2. FORMATION DESCRIPTION			DEPTH	DEPTH	DEPTH	DEPTH
3.00' FORTRESS			17	17	17	17
COARSE SAND "WET"			17	54	54	54
COARSE SAND AND GRAVEL			11	65	65	65
HARD GRAY CLAY AND GRAVEL			1	8	8	8
SOFT GRAY CLAY			13	87	87	87
COARSE SAND			8	95	95	95
GRAVEL			22	175	175	175
COARSE SAND			3	212	212	212
SOFT GRAY CLAY AND GRAVEL			5	223	223	223
COARSE SAND			6	239	239	239
4. SCREEN			<input type="checkbox"/> Installed 10' Stainless Steel Diameter 4.00 Set 0.012 Length 6.0 5' 1" long 223.00 ft. and 223.00 ft. Fitting: 0-0-0-0 Head back <input type="checkbox"/> Breuer check <input type="checkbox"/> Blowdown action 1.0 ft. Other			
5. WATER LEVEL			17.00 ft. below land surface <input type="checkbox"/> Flow			
6. PUMP			10' pump <input type="checkbox"/> 10' pump Completion: <input type="checkbox"/> Drillless adapter <input type="checkbox"/> Drill down with <input type="checkbox"/> Different offset <input type="checkbox"/> Improved fit			
7. WELL CAPTURE			<input type="checkbox"/> Well cap <input type="checkbox"/> Well cap from <input type="checkbox"/> 0 ft. no. of bags of cement <input type="checkbox"/> Additives			
8. RECENT SOURCE OF POSSIBLE CONTAMINATION			<input type="checkbox"/> Recent source of possible contamination Type: Septic Distance 150 ft. direction N Well disturbed open completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No			
9. PUMP			<input type="checkbox"/> Pump installed <input type="checkbox"/> Pump installation only Pump manufacturer's name <input type="checkbox"/> Pump Model number <input type="checkbox"/> HP Volts length of pump pipe 0 ft. capacity 0 G.P.M. lift 1 Submersible <input type="checkbox"/> Jet PRESSURE TANK Manufacturer's name <input type="checkbox"/> Pump Model number Capacity 0 Gallons			
10. OPERATOR'S CERTIFICATION:			I hereby certify my operator's certification: This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.			
11. DATA SOURCE: Michigan Groundwater Survey			REGISTERED BUSINESS NAME 6112 REGISTRATION NO.			
12. Big Operator's Name:			APPROVED REPRESENTATIVE Date			

This is an MDEQ computer-generated form of a water well record submitted under PA 368 of 1972.
This is not a legal document.

F4

WATER WELL AND PUMP RECORD

This is an 1983 computer generated facsimile of a document originally submitted under FOIA of 1974.
This is not a legal document.



WATER WELL AND PUMP RECORD

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¹⁵ Banks elevated source of data risk.

Data Source: MDP

17. Bij Shastri's 75th

the best of my knowledge and belief.

This is a 1999 computer-generated facsimile of a handwritten record submitted under D.R.O. of 1978.
This is not a handwritten page.

WATER WELL AND PUMP RECORD

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WATER WELL AND PUMP RECORD

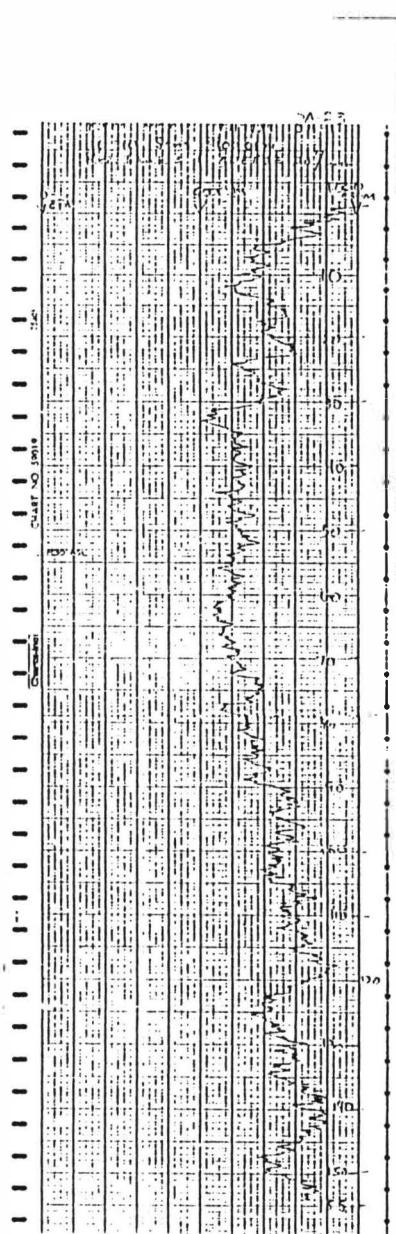
100

Figure 9: 2D regularized formula for the well-posed solution under $H^{-1}(\Omega) \times H^1(\Omega)$. This plot is for $\delta = 10^{-3}$.

WATER WELL AND PUMP RECORD

This is an RPP-generated Form 10-Q and was submitted under NY 36 of 1973.
This is not a legal document.

Cx2



WATER WELL AND PUMP RECORD

Location of well:	074110001	(C3)	Latitude:	36° 14' N	Longitude:	96° 17' W	Section:	10	Township:	48	Range:	11
Well Operator:	W. H. Gandy	Completion Date:	10/10/68	Completion Method:	Drilled	Water Type:	Groundwater	Water Quality:	Good	Water Use:	Domestic	
Direction And Distance From Public Improvement:												
10' ENE 35' NW 100' ENE 35' NE 05' ENE 100' SSW 05' NE 05'												
Exact Address Or Description Of Well Location:												
Custer, Kansas												
Notes with "X" in Section Below:												
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>												
Elevation (ft. MSL) 172.00 ± 1												
FORMATION DESCRIPTION												
Top Soil:	1	THICKNESS (ft.)	0.10	TYPE	Soil	Material	Selected	Height Above Surface (ft.)	1.6			
MURK SAND	2	THICKNESS (ft.)	0.00	TYPE	Gravel	Material	Washed	Height Above Surface (ft.)	0.00			
MEDIUM SAND & S. CLAY	3	THICKNESS (ft.)	0.00	TYPE	Sand	Material	Washed	Height Above Surface (ft.)	0.00			
COARSE SAND AND GRAVEL	4	THICKNESS (ft.)	0.00	TYPE	Sand	Material	Washed	Height Above Surface (ft.)	0.00			
COarse sand - water screen	5	THICKNESS (ft.)	0.00	TYPE	Sand	Material	Washed	Height Above Surface (ft.)	0.00			
STONY SAND	6	THICKNESS (ft.)	0.00	TYPE	Sand	Material	Washed	Height Above Surface (ft.)	0.00			
STONY GRAY CLAY	7	THICKNESS (ft.)	0.00	TYPE	Clay	Material	Washed	Height Above Surface (ft.)	0.00			
COARSE SAND AND GRAVEL WITH ROLLERS	8	THICKNESS (ft.)	0.00	TYPE	Sand	Material	Washed	Height Above Surface (ft.)	0.00			
CONGLOMERATE WITH LIMESTONE	9	THICKNESS (ft.)	0.00	TYPE	Sand	Material	Washed	Height Above Surface (ft.)	0.00			
FIELD DATA												
1. Pump Type:	1. Horizontal pump 1.00" dia. grade 1. Basement offset 1. Open top											
2. Well diameter:	1.00" (10") 1.00" (10") 1.00" (10")											
3. Well screen:	1.00" (10") 1.00" (10") 1.00" (10")											
4. Number of stages:	1.00" (10") 1.00" (10") 1.00" (10")											
5. Filter:	1.00" (10") 1.00" (10") 1.00" (10")											
6. Pump installed:	1.00" (10") 1.00" (10") 1.00" (10")											
7. Manufacturer's name:	1.00" (10") 1.00" (10") 1.00" (10")											
8. Model number:	1.00" (10") 1.00" (10") 1.00" (10")											
9. Length of drop pipe:	1.00" (10") 1.00" (10") 1.00" (10")											
10. Pump size:	1.00" (10") 1.00" (10") 1.00" (10")											
11. Pump motor:	1.00" (10") 1.00" (10") 1.00" (10")											
12. Pump motor capacity:	1.00" (10") 1.00" (10") 1.00" (10")											
13. Pump motor current requirements:	1.00" (10") 1.00" (10") 1.00" (10")											
14. Pump motor insulation class:	1.00" (10") 1.00" (10") 1.00" (10")											
15. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
16. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
17. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
18. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
19. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
20. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
21. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
22. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
23. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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25. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
26. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
27. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
28. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
29. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
30. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
31. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
32. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
33. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
34. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
35. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
36. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
37. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
38. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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41. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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46. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
47. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
48. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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51. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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60. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
61. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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64. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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67. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
68. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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73. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
74. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
75. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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78. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
79. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
80. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
81. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
82. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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86. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
87. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
88. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
89. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
90. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
91. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
92. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
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94. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
95. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
96. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
97. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
98. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
99. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
100. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
101. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
102. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
103. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
104. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
105. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
106. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
107. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
108. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
109. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
110. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
111. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
112. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
113. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
114. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
115. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
116. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
117. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
118. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
119. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
120. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
121. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
122. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
123. Pump motor insulation temperature rating:	1.00" (10") 1.00" (10") 1.00" (10")											
124. Pump motor insulation voltage rating:	1.00" (10") 1.00" (10") 1.00" (10")											
125. Registered Business Name:	W.H. Gandy											
126. Registered Office:	Custer, Kansas											
127. Type:	Proprietor Representative											
128. Registration Date:	06/06/68											
This is an 1970 registration renewal of original 1968 well filed under 1A-30 of 1973.												

WATER WELL AND PUMP RECORD

This is an MDPI computer-generated template of a manuscript received and submitted under MDPI's open access journal system.

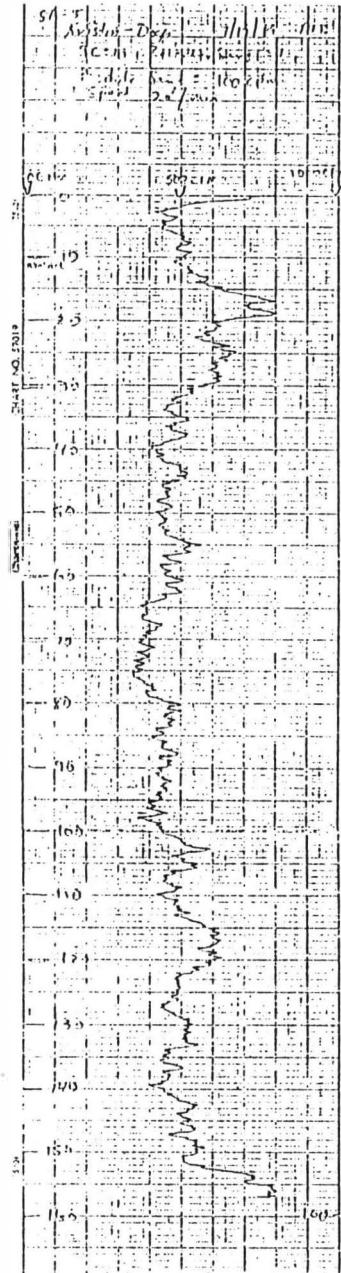
C4



WATER WELL AND PUMP RECORD

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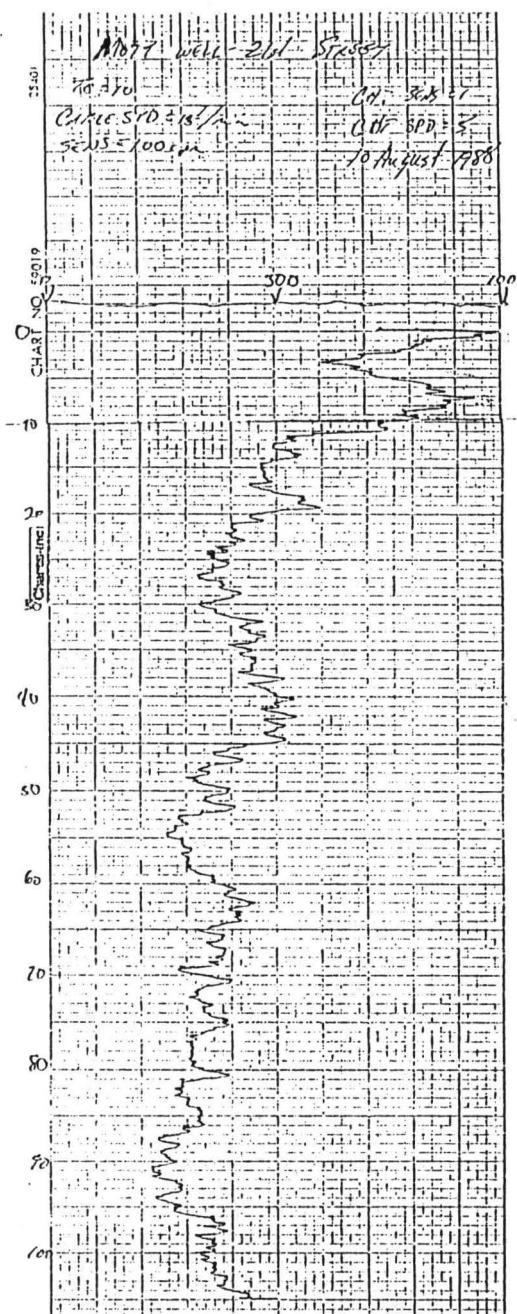
1 LOCATION OF WELL 3974112700		Tax Parcel # <i>C5</i>					
County KALAMAZOO	Township Name SCHOOLCRAFT	Fraction SE 1/4 SW 1/4 SW 1/4	Section 27	Town 04 S	Range 11 W		
Distance And Direction From Road Intersection EE AVE 1/4 MILE INTO SOUTH ON HOWARD LANE WELL SA-5, Street Address & City of Well Location		3 OWNER OF WELL Geology Dept Address WESTERN MICH. UNIVERSITY KALAMAZOO, MI 49007 Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
Locate with 'I' in Section Below		Sketch Map					
		4 WELL DEPTH: <input type="checkbox"/> Date Completed: <input type="checkbox"/> New Well 205.0 ft. <input type="checkbox"/> 12/10/88 <input type="checkbox"/> Replacement Well 5 <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotor <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted _____ 6 RSP: <input type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type II Public <input type="checkbox"/> Metal Pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type III Public <input type="checkbox"/>					
ELEVATION 881.00 nsf		7 CASING: <input type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded Depth to bottom of stratum: _____ Diameter: 4.00 in. to 156.0 ft. depth 0.00 in. to 0.0 ft. depth Grouted Drill Hole Diameter: 0.00 in. to 0.0 ft. depth Right: Above Surface: 1.0 ft. Weight: lbs./ft. Drive Shop <input type="checkbox"/> Yes <input type="checkbox"/> No					
2 FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	8 SCREEN: <input type="checkbox"/> Not Installed Type: Stainless Steel <input type="checkbox"/> Diameter: 4.00 Set: 15.00 <input type="checkbox"/> Length: 6.0 Set between: 156.00 ft. and 162.00 ft. FITTINGS: <input type="checkbox"/> Is-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 1.0 ft. Other _____			
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)		15	91				
GRAVEL (WET)		3	96				
COARSE SAND (WET)		7	103	9 STATIC WATER LEVEL: 8.00 ft. below land surface <input type="checkbox"/> Flow			
COARSE SAND & GRAVEL (WET)		2	105	10 PUMPING LEVELS: 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.			
GRAVEL (WET)		32	137				
COARSE SAND & GRAVEL (WET)		11	148	11 WELL HEAD COMPLETION: <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 1/2" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit			
GRAVEL (WET)		14	162				
SOFT GRAY CLAY AND GRAVEL		8	170	12 WELL GROUTED? <input type="checkbox"/> No filter from to ft. <input type="checkbox"/> Meant cement <input type="checkbox"/> bentonite <input type="checkbox"/> Other _____ No. of bags of cement _____ Additives _____			
HARD GRAY CLAY		35	205	13 Nearest source of possible contamination Type: None Distance: 0 ft. Direction: _____ Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No			
15. Remarks, elevation, source of data, etc.		14 PUMP: <input type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name: _____ Model number: RP Volly Length of Drop Pipe: 0 ft. capacity: 0 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name: _____ Model number: Capacity: 0 Gallons					
Data Source: Michigan Groundwater Survey		15. 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.					
17. Rig Operator's Name:		REGISTERED BUSINESS NAME Address _____			REGISTRATION NO. 0112		
		Signed _____			Date _____		
18. 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

LOCATION OF WELL	397415001	Latitude	41° 36' 14" N	Longitude	95° 14' 34" W	Section	Sec 1	Block	Block 1
County	EMERSON	Township	SW 1/4						
Distance from Road Intersection 1250' S 21 3 400 450' E of 21ST 1550' S 21ST, Section 81, Block 81									
Exact Address or City of Well Location									
Depth to bottom of well in feet below		Station No.							
		ELEVATION 46.00 ft							
2 FORMATION DESCRIPTION		THICKNESS OF STRATA	DEPTHS OF STRATA						
BENTON SAND AND GRAVEL		40	40						
COARSE SAND		50	100						
3 PUMPING TESTS									
3.1 TEST 1									
3.2 TEST 2									
3.3 TEST 3									
3.4 TEST 4									
3.5 TEST 5									
3.6 TEST 6									
3.7 TEST 7									
3.8 TEST 8									
3.9 TEST 9									
3.10 TEST 10									
3.11 TEST 11									
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WATER WELL AND PUMP RECORD

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1 LOCATION OF WELL 39741126001		Tax Parcel 1				
County KALAMAZOO	Township Name SCHOOLCRAFT	Fraction SE 1/4 SE 1/4 NE 1/4	Section 26	Town 04 S	Range W	
Distance And Direction From Road Intersection 100' N OF XY AND 150' W OF 22ND 15540 S 22ND, SCHOOLCRAFT 49087		1 OWNER OF WELL Address 15540 S 22ND SCHOOLCRAFT, MI 49087				
Street Address & City of Well Location		Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Locate with 'X' in Section Below		Sketch Map				
		ELEVATION 885.00 msl				
2	FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	CASING:		
	SAND & GRAVEL	30	30	<input type="checkbox"/> Steel	<input type="checkbox"/> Threaded	Height: Above Surface 1.0 ft.
	GRAY CLAY & GRAVEL	50	80	<input type="checkbox"/> Plastic	<input type="checkbox"/> Welded	Diameter 4.00 in. to 8.0 ft. depth
	COARSE SAND & GRAVEL	7	87	<input type="checkbox"/> GROUTED	<input type="checkbox"/> Threaded	Weight lbs/ft.
				<input type="checkbox"/> Drill Hole Diameter 0.00 in. to 0.0 ft. depth	<input type="checkbox"/> Drive Shoe <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Drive Shoe <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
				<input type="checkbox"/> Set between 0.00 ft. and 87.00 ft.	<input type="checkbox"/> Other	
				<input type="checkbox"/> FITTINGS: <input type="checkbox"/> Kick-off <input type="checkbox"/> Head Packer <input type="checkbox"/> Bremer Check	<input type="checkbox"/> Blank above screen 0.0 ft. <input type="checkbox"/> Other	
				<input type="checkbox"/> Static Water Level: 30.00 ft. below land surface	<input type="checkbox"/> Flow	
				<input type="checkbox"/> PUMPING LEVEL: below land surface 70 ft. after 1.0 hrs. pumping at 50 G.P.M.	<input type="checkbox"/> Flow	
				<input type="checkbox"/> 0 ft. after 0.0 hrs. pumping at 0 G.P.M.	<input type="checkbox"/> Pump Installation Only	
				<input type="checkbox"/> WELL HEAD COMPLETION: <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 10' above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit	<input type="checkbox"/> Pump Installation Only	
				<input type="checkbox"/> WELL GROUTED? <input type="checkbox"/> No <input type="checkbox"/> Yes From To ft. <input type="checkbox"/> Mortar cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other	<input type="checkbox"/> Pump Installation Only	
				No. of bags of cement _____ Additives _____	<input type="checkbox"/> Pump Installation Only	
				<input type="checkbox"/> NEAREST SOURCE OF POSSIBLE CONTAMINATION: <input type="checkbox"/> Septic Type <input type="checkbox"/> Distance 90 ft. Direction N	<input type="checkbox"/> Pump Installation Only	
				<input type="checkbox"/> Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Pump Installation Only	
				<input type="checkbox"/> Was old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Pump Installation Only	
				<input type="checkbox"/> PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump Installation Only	<input type="checkbox"/> Pump Installation Only	
				Manufacturer's name STA RITE	<input type="checkbox"/> Pump Installation Only	
				Model number NP .5 Volts	<input type="checkbox"/> Pump Installation Only	
				Length of Drop Pipe 12 ft. capacity 14 G.P.M.	<input type="checkbox"/> Pump Installation Only	
				TYPE: <input type="checkbox"/> In-situ <input type="checkbox"/> Jet	<input type="checkbox"/> Pump Installation Only	
				PRESSURE TANK:	<input type="checkbox"/> Pump Installation Only	
				Manufacturers name	<input type="checkbox"/> Pump Installation Only	
				Model number Capacity 14 Gallons	<input type="checkbox"/> Pump Installation Only	
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.				
Data Source: MNR		REGISTERED BUSINESS NAME Address			REGISTRATION NO. 0112	
17. Rig Operator's Name:		Signed			AUTHORIZED REPRESENTATIVE Date	

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WATER WELL AND PUMP RECORD

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1 LOCATION OF WELL 39741030001		Tax Parcel 1							
County KALAMAZOO	Township Name BRADY	Fraction SW 1/4 SW 1/4 SW 1/4	Section 30	Town 04 S	Range 10 W				
Distance And Direction From Road Intersection 250' E OF 24TH AND 120' N OF Y 5085 T AVENUE, VICKSBURG 49097 Street Address & City of Well Location		<p>3 OWNER OF WELL IMANSE, BRUCE Address 308 S MICHIGAN VICKSBURG MI 49097</p> <p>Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>4 WELL DEPTH: <input type="checkbox"/> Date Completed <input checked="" type="checkbox"/> New Well 40.0 FT. <input type="checkbox"/> 05/08/76 <input checked="" type="checkbox"/> Replacement Well</p> <p>5 <input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted <input type="checkbox"/></p> <p>6 USE <input type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Test Well <input type="checkbox"/> Type IIb Public <input type="checkbox"/> Metal Pump</p>							
Indicate with 'I' in Section Below		Sketch Map							
ELEVATION 818.00 nsf									
2 FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	<p>7 CASING: <input type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded Height: Above Surface 1.0 ft. Diameter 2.00 in. to 37.0 ft. depth 1.25 in. to 40.0 ft. depth Grouted Drill Hole Diameter Drive Shoe <input type="checkbox"/> Yes 0.00 in. to 0.0 ft. depth <input type="checkbox"/> No 0.00 in. to 0.0 ft. depth</p> <p>8 SCREEN: <input type="checkbox"/> Not Installed Type Stainless Steel Diameter 1.25 Slat 0.010 length 1.0 Set between 37.00 ft. and 40.00 ft. FITTINGS: <input type="checkbox"/> JK-Packer <input type="checkbox"/> Lead Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 0.0 ft. Other</p> <p>9 STATIC WATER LEVEL: 14.00 ft. below land surface <input type="checkbox"/> Flow</p> <p>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.</p> <p>11 WELL HEAD COMPLETION: <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 112" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit</p> <p>12 WELL GROUTED? <input type="checkbox"/> No <input type="checkbox"/> Yes From to ft. <input type="checkbox"/> Mort cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other _____ No. of bags of cement _____ Additives _____</p> <p>13 Previous source of possible contamination Type Septic Distance 60 ft. Direction NW Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>14 PUMP: <input type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name DAYTON Model number MP .5 Volts Length of Drop Pipe 21 ft. capacity 0 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturers name _____ Model number Capacity 0 Gallons</p>					
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.							
Data Source: MDNR		REGISTERED BUSINESS NAME: 8167 Address: _____ REGISTRATION NO. _____							
17. Rig Operator's Name:		Signed: _____ Date: _____ AUTORIZED REPRESENTATIVE: _____							

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL	39741028004	1C9	Tax Parcel 1								
County	RALAMAZOO	Township Name	BRADT	Fraction	NW 1/4 SW 1/4 SE 1/4	Section	28	Town	84 S	Range	10 W
Distance And Direction From Road Intersection 1150' S OF XY AND 250' E OF 29TH 15731 S 29TH STREET, VICKSBURG 49097				OWNER OF WELL				JORDAN, FRED			
Street Address & City of Well Location				Address				7215 RAVINE RALAMAZOO, MI 49089			
Locate with 'X' in Section Below				Sketch Map				Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
ELEVATION 854.00 msl				4 WELL DEPTH:				Date Completed	New Well		
				107.0 ft.				02/28/76	Replacement Well		
				<input checked="" type="checkbox"/> Cab; Tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug				<input type="checkbox"/> Hollow rod <input checked="" type="checkbox"/> Auger/Bored <input type="checkbox"/> Jettled			
				<input type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Type II Public <input type="checkbox"/> Heat Pump				<input type="checkbox"/> Heat Well <input type="checkbox"/> Type IIb Public			
				5 CASING:				<input checked="" type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded	Height: Above Surface 1.0 ft.		
				Diameter 2.00 in. to 103.0 ft. depth				Weight lbs/ft.			
				0.00 in. to 0.0 ft. depth							
				Grouted Drill Hole Diameter 0.00 in. to 0.0 ft. depth				Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
				0.00 in. to 0.0 ft. depth							
				6 SCREEN				<input checked="" type="checkbox"/> Not Installed			
				Type Unknown <input type="checkbox"/> 1.25				Diameter 1.25			
				SLOT 0.010 <input type="checkbox"/> Length 4.0							
				Set between 103.00 ft. and 107.00 ft.							
				FITTINGS: <input type="checkbox"/> Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 0.0 ft. Other							
				7 STATIC WATER LEVEL:				15.00 ft. below land surface <input type="checkbox"/> Flow			
				8 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.			
				9 WELL READ COMPLETION: <input checked="" type="checkbox"/> Pitless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit							
				10 WELL GROUTED? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes From To ft.							
				<input type="checkbox"/> Mortar <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement Additives							
				11 Nearest source of possible contamination Type Septic Distance 75 ft. Direction N Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No							
				12 PUMP: <input checked="" type="checkbox"/> Not installed <input type="checkbox"/> Pump Installation Only Manufacturer's name RAPIDATOR Model number NP .25 Volts Length of Drop Pipe 42 ft. capacity 12 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Injet PRESSURE TANK: Manufacturer's name Capacity 12 Gallons Model number							
13. Remarks, elevation, source of data, etc.				14. 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.				15) REGISTERED BUSINESS NAME		REGISTRATION NO.	
Data Source: MDNR				Address				Signed		Date	
17. Rig Operator's Name:				AUTHORIZED REPRESENTATIVE							

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL	39741034001	Cc10	Tax Parcel #								
County	KALAMAZOO	Township Name	BRADY	Fraction	NR 1/4 NE 1/4 NW 1/4 SW 1/4	Section	34	Town	04 S	Range	10 W
Distance And Direction From Road Intersection 500 S OF I AND 100' W OF 31ST 16082 S 31ST STREET, VICKSBURG 49097				1 OWNER OF WELL ROWER, WILLIAM Address 701 HAMILTON VICKSBURG, MI 49097 Address Same As Well Location? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No							
Street Address & City of Well Location				4 WELL DEPTH: 50.0 FT. Date Completed: 11/20/76 <input type="checkbox"/> New Well <input checked="" type="checkbox"/> Replacement Well 5 <input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotar <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted							
Locate with 'X' in Section Below				Sketch Map							
ELEVATION 853.00 msl				6 USE: <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Test Well <input type="checkbox"/> Type II Public <input type="checkbox"/> Real Pump							
2 FORMATION DESCRIPTION				THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	7 CASING:		Height: Above Surface 1.0 ft.			
SAND				5	5	<input type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded	Diameter 2.00 in. to 47.0 ft. depth	Weight 1 lb/ft.			
CLAY				3	8		1.75 in. to 50.0 ft. depth	Drive Shoe <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
COURSE SAND				11	19		Grooved Drill Rod Diameter 0.00 in. to 0.0 ft. depth				
CLAY				2	21						
COURSE SAND AND STONE				25	46						
WATER SAND				4	50						
8 SCREEN						<input type="checkbox"/> Not Installed					
Type Stainless Steel				Diameter 1.25							
SLOT 0.010				Length 3.0							
Set between 47.00 ft. and 50.00 ft.											
FITTINGS: <input type="checkbox"/> IF-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Tremie Check											
<input type="checkbox"/> Blank above screen 0.0 ft. Other											
9 STATIC WATER LEVEL: 15.00 ft. below land surface						<input type="checkbox"/> Flow					
10 PUMPING LEVEL: below land surface 15 ft. after 1.0 hrs. pumping at						<input type="checkbox"/> G.P.M. <input type="checkbox"/> 15 ft. after 1.0 hrs. pumping at		<input type="checkbox"/> G.P.M.			
11 WELL HEAD COMPLETION: <input type="checkbox"/> Pipeless adapter <input type="checkbox"/> 12" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit											
12 WELL GROUTED? <input type="checkbox"/> No <input type="checkbox"/> Yes From to ft. 1 Meal cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement _____ Additives _____											
13 Natural source of possible contamination Type Septic Distance 50 ft. Direction S Well discontinued upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No											
14 PUMP: <input type="checkbox"/> Not Installed <input type="checkbox"/> Pump Installation Only Manufacturer's name KAPITATION Model number RP-5 Volts Length of Drop Pipe 26 ft. capacity 10 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name _____ Model number Capacity 10 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.							
Data Source: MDNR				REGISTERED BUSINESS NAME 1062 Address _____ REGISTRATION NO. _____							
17. Rig Operator's Name:				Signed _____ AUTHORIZED REPRESENTATIVE _____ Date _____							

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL:		397410035002	C-11		Tax Parcel #		
County	Township Name	Fraction		Section	Town	Range	
KALAMAZOO	BRADY	NE 1/4 NW 1/4 SE 1/4		35	04 S	08 N	
Distance And Direction From Road Intersection 100' E OF 33RD AND 300' S OF TA 9722 18 AVENUE, VICKSBURG 49097				1 OWNER OF WELL Address 9722 TA AVENUE VICKSBURG, MI 49097 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Street Address & City of Well Location							
Locate with 'X' in Section Below				Sketch Map			
				<input type="checkbox"/> WELL DEPTH: 58.0 FT. <input type="checkbox"/> Date Completed 10/00/81 <input type="checkbox"/> New Well <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted <input type="checkbox"/> USE <input checked="" type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Residential <input type="checkbox"/> Type II Public <input type="checkbox"/> Heat Pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type IV Public			
ELEV AT 10 886.00 msl				7 CASING: <input type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Welded <input type="checkbox"/> Height: Above Surface 1.0 ft. <input type="checkbox"/> Plastic <input type="checkbox"/> Dia. 2.00 in. to 30.0 ft. depth <input type="checkbox"/> Weight lbs/ft. <input type="checkbox"/> Dia. 0.0 in. to 0.0 ft. depth <input type="checkbox"/> Grouted Drill Hole Diameter <input type="checkbox"/> Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> Dia. 0.0 in. to 0.0 ft. depth <input type="checkbox"/> Dia. 1.25 in. <input type="checkbox"/> Dia. 0.0 in. to 0.0 ft. depth <input type="checkbox"/> Length 3.5 ft. <input type="checkbox"/> Set between 54.50 ft. and 50.00 ft. <input type="checkbox"/> FITTINGS: <input type="checkbox"/> K-Packer <input type="checkbox"/> Lead Packer <input checked="" type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 0.0 ft. Other			
2 FORMATION DESCRIPTION				8 SCRAPER <input type="checkbox"/> TIPS: 80,000 <input type="checkbox"/> Dia. 1.25 in. <input type="checkbox"/> CANAL: 80,000 <input type="checkbox"/> Length 3.5 ft. <input type="checkbox"/> Set between 54.50 ft. and 50.00 ft. <input type="checkbox"/> FITTINGS: <input type="checkbox"/> K-Packer <input type="checkbox"/> Lead Packer <input checked="" type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 0.0 ft. Other			
TOP SOIL				1	1	9 STATIC WATER LEVEL: 25.00 ft. below land surface <input type="checkbox"/> Flow	
RED CLAY				8	9	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.	
RED CLAY AND SAND				24	33	11 WELL HEAD COMPLETION: <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 112" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit	
GRAV B				6	39	12 WELL GROUTED? <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes From to ft. <input type="checkbox"/> Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other _____ No. of bags of cement _____ Additives _____	
SHALE				2	41	13 Nearest source of possible contamination Type Septic Distance 50 ft. Direction NE Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
BLUE CLAY SANDY WATER				11	52	14 PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump Installation Only Manufacturer's name _____ Model number _____ HP _____ Volts _____ Length of Drop Pipe 0 ft. capacity 0 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturers name _____ Model Number Capacity 0 Gallons	
BLUE CLAY				2	54	15. Remarks, elevation, source of data, etc. Data Source: MDNR	
SANDY WATER				4	58	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: 8205 Address: _____ Signed: _____ Date: _____ AUTHORIZED REPRESENTATIVE: _____	

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WATER WELL AND PUMP RECORD

Page | 7

Location of Well		39741228001	H2	Page 1 of 1		Tax Parcel #																							
County	RATONAZO	Township Name	PRairie Dodge	Fraction	NE 1/4	NW 1/4	NW 1/4	Section	28	Town	04 S	Range	22 E																
Distance & Direction From Road Intersection 1000' E OF 4TH STREET, 150' S OF X AVENUE 8811 W X AVENUE, SCHOOLCRAFT 49087 Street Address & City of Well Location				Owner of Well Name: IRONS, JACK Address: 8811 W X AVENUE SCHOOLCRAFT, MI 49087 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																									
Locate with 'X' in Section Below				Sketch Map				Well Depth: _____ ft. Date Completed: 01/09/02 Well Placement: _____																					
								5' Int. Col. In Land: <input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Drilled <input type="checkbox"/> Boring	6' USE: <input checked="" type="checkbox"/> Residential <input type="checkbox"/> Irrigation <input type="checkbox"/> Residential <input type="checkbox"/> Public																				
ELEVATION 800.00 asl								7' CASING: <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Plastic <input type="checkbox"/> Welded Height: Above Surface 1.0 ft.	8' Screen: <input type="checkbox"/> Not Installed <input checked="" type="checkbox"/> Stainless Steel Diameter: 3.00 <input type="checkbox"/> Slotted: 0.018 Length: 6.0 <input type="checkbox"/> Set: Bottom 50.00 ft. and 74.00 ft. <input type="checkbox"/> Other: <input type="checkbox"/> Filter: <input checked="" type="checkbox"/> Back-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Bremer check <input type="checkbox"/> Elbow joint above screen 1.0 ft. <input type="checkbox"/> Other																				
<table border="1"> <thead> <tr> <th>2</th> <th>FORMATION DESCRIPTION</th> <th>THICKNESS OF STRATUM</th> <th>DEPTH TO BOTTOM OF STRATUM</th> </tr> </thead> <tbody> <tr> <td>GRAVEL</td> <td></td> <td>30</td> <td>30</td> </tr> <tr> <td>SAND & GRAVEL</td> <td></td> <td>20</td> <td>50</td> </tr> <tr> <td>SOAT CLAY & GRAVEL</td> <td></td> <td>15</td> <td>65</td> </tr> <tr> <td>COARSE SAND & GRAVEL</td> <td></td> <td>9</td> <td>74</td> </tr> </tbody> </table>				2	FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	GRAVEL		30	30	SAND & GRAVEL		20	50	SOAT CLAY & GRAVEL		15	65	COARSE SAND & GRAVEL		9	74					9' Static Water Level: 25.00 ft. below land surface <input type="checkbox"/> Flow	10' Pumping Level: Below land surface <input type="checkbox"/> Flow after 1.0 hrs. pumping at 50 G.P.M. <input type="checkbox"/> Flow after 0.0 hrs. pumping at 0 G.P.M.
2	FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM																										
GRAVEL		30	30																										
SAND & GRAVEL		20	50																										
SOAT CLAY & GRAVEL		15	65																										
COARSE SAND & GRAVEL		9	74																										
								11' Well Head Completion: <input type="checkbox"/> Threadless adapter <input type="checkbox"/> 112" above grade <input type="checkbox"/> Blowout offset <input type="checkbox"/> Apparatus pit	12' Well Spacing: <input type="checkbox"/> 100' Laterals from to <input type="checkbox"/> 100' from center <input type="checkbox"/> Bentonite <input type="checkbox"/> Other <input type="checkbox"/> Box of bags of cement <input type="checkbox"/> Additives																				
								13' Nearest source of possible contamination Type: Septic Distance: 75 ft. Direction: N Well disinfected upon completion? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> New old well plugged?	14' Pump: <input type="checkbox"/> Not installed <input checked="" type="checkbox"/> Deep Installation Only Manufacturer's name STA RITE Model number: NP .75 Volts Length of Drop Pipe: 42 ft. capacity: 0 G.P.M. TYPE: InSubmersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name: Capacity: 0 Gallons Model number:																				
15. Remarks, elevation, source of data etc. K-TACKER, SAMPLER 1989								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.																					

15. Remarks, elevation, source of data, etc.
K-TACKER, SAMPLED 1989

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

AUTHORIZED REPRESENTATIVE

0112
RECEIVED MAR 10 1983

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WATER WELL AND PUMP RECORD

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LOCATION OF WELL	39741235002	H3	TAX PARCEL #
County	TOWNSHIP NAME KALAMAZOO		FRACTION NE 1/4 NW 1/4 SW 1/4
SECTION 35		TOWN 04 S	RANGE 12 W
DISTANCE AND DIRECTION FROM ROAD INTERSECTION 5100' E OF 7TH STREET, 250' S OF Y3 AVENUE 6767 W 72 AVENUE, SCHOOLCRAFT 49087			
STREET ADDRESS & CITY OF WELL LOCATION			
Locate with 'X' in Section Below		Sketch Map	
ELEVATION 885.00 msl			
2 FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO MIDLINE OF STRATUM	CASING: <input type="checkbox"/> Steel <input type="checkbox"/> Plastic <input type="checkbox"/> Threaded <input type="checkbox"/> Welded Diameter 4.00 in. to 22.00 ft. depth 4.00 in. to 0.0 ft. depth Cased Drill Hole Diameter 9.00 in. to 0.0 ft. depth 0.00 in. to 0.0 ft. depth Surface Above Weight 1.0 ft. Weight 1/2 ft. Drive Shoe <input type="checkbox"/> Yes <input type="checkbox"/> No
BLACK DIRT	2	2	
BROWN CLAY	11	13	
SAND	6	19	
BROWN CLAY	9	28	5 SCREEN Type Stainless Steel Slot 0.010 Set between 22.00 ft. and 76.00 ft.
SAND	12	40	FITTINGS: <input type="checkbox"/> IR-fitter <input type="checkbox"/> Lead fitter <input type="checkbox"/> Driener Check <input type="checkbox"/> Blank above screen 1.0 ft. Other
GREY CLAY	25	55	
WATER SAND	11	76	6 STATIC WATER LEVEL: 40.00 ft. below land surface <input type="checkbox"/> 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: <input type="checkbox"/> Drillless adapter <input type="checkbox"/> 112" above grade Basement offset <input type="checkbox"/> Approved pit
			12 WELL CEMENTER: <input type="checkbox"/> 100' holes from 10 to ft. <input type="checkbox"/> 100' cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement _____ Additives _____
			13 nearest source of possible contamination Type Unknown Distance 0 ft. Direction Well disinjected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No
			14 PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump installation only Manufacturer's name STA RITE Model number RP-5 Volts Length of pump pipe 60 ft. capacity 8 G.P.M. TYPE: In-situvertible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name _____ Model number _____ Capacity 8 gallons
15 Remarks, elevation, source of data, etc. 12' ABOVE GRADE ALSO CEMENTED			
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.			
Data Source: MDNR		REGISTERED BUSINESS NAME	REGISTRATION NO. 1711
Address		Date	
Signed		AUTHORIZED REPRESENTATIVE	

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WATER WELL AND PUMP RECORD

Page 1 of 1

1 LOCATION OF WELL County KALAMAZOO	19741236011 Township Name PRairie Ronde	Fraction SE 1/4 NW 1/4 NW 1/4	Section 36	Town 04 S	Range 12 W
Tax Parcel 1					
Distance And Direction From Road Intersection 620' N OF Y2 AVENUE, 50' E. OF PRairie Ronde 16162 (PRAIRIE RONDE, SCHOOLCRAFT 49087)					
Street Address & City of Well Location					
Locate with 'X' in Section Below		Sketch Map			
ELEVATION 850.00 psi					
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		
3 Casing Thickness _____					
4 WELL DEPTH: 120.0 ft. Date Completed: 1/21/78 1 New Well 2 Replacement Well					
5 (1) Cable Tool 1 Rotor 1 Driven 1 Auger 1 Hollow rod 1 Auger/Bored 1 Jetted					
6 USE (Domestic) 1 Type I Public 1 Type III Public 1 Irrigation 1 Type II Public 1 Heat Pump 1 Test Well 1 Type III Public 1					
7 CASING: 1 Steel 1 Threaded 1 Bright Above 1 Plastic 1 Welded 1 Surface 1.0 ft. Diameter 4.00 in. to 116.0 ft. depth Weight ____ lbs/ft. 0.00 in. to 0.0 ft. depth Ground Drill Hole Diameter 0.00 in. to 0.0 ft. depth Drive Shoe (1) Yes 0.00 in. to 0.0 ft. depth 1 No					
8 SCREEN Type Stainless Steel Diameter 4.00 Size 0.010 Length 4.0 Set between 116.00 ft. and 120.00 ft. FITTINGS: 1 El-fitter 1 Head Parker 1 Bourne Check 1 Blank above screen 1.0 ft. Other					
9 STATIC WATER LEVEL: 15.00 ft. below land surface 1 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 CONSTRUCTION: 1 Pipeless adapter 1 1/2" above grade 1 Basement offset 1 Approved pit					
12 WELL GROUTED? 1 No Ties From To ft. 1 Seal cement 1 Bentonite 1 Other No. of bags of cement ____ Abilities _____					
13 Nearest source of possible contamination Type Septic Distance 65 ft. Direction N Well disinfected upon completion? 1 Yes 1 No Was old well plugged? 1 Yes 1 No					
14 PUMP: 1 Not installed 1 Pump Installation Only Manufacturer's name STA RITE Model number HP-5 Volts length of Draw Pipe 42 ft. capacity 10 G.P.M. TYPE: 1 Submersible 1 Jet					
15 PRESSURE TANK: Manufacturer's 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.					
Data Source: MDNR			REGISTERED BUSINESS NAME _____ Address _____ Signed _____	REGISTRATION NO. 0112	Date _____
17. Big Operator's Name: AUTHORIZED REPRESENTATIVE					

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WATER WELL AND PUMP RECORD

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WATER WELL AND GROUND WATER RESERVOIR

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WATER WELL AND PUMP RECORD

Page 1 of 1

File Number F-112-1

1. LOCATION OF WELL	75751112001	A7	Fraction	NE 1/4 SW 1/4 NW 1/4	Section	12	Town	BS S	Range	11 N
County	ST. JOSEPH	Township Name	DRK							
Distance & Direction from Road Intersection S.E. of MICHIGAN AVE. 51261 FAIRVILLE Rd, SCHOONERSFELD 49027										
Street Address & City of Well Location										
Locate with 'X' in Section Below										
Sketch Map										
ELEVATION 845.00 psi										
2. FORMATION DESCRIPTION	THICKNESS	DEPTH	DEPTH OF	3. PIPING	4. SCREEN	5. SEPTIC	6. PUMP			
DRY GRAVEL	10	10	Bottom of	<input type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Plastic <input type="checkbox"/> Welded	<input type="checkbox"/> Screen <input type="checkbox"/> Stainless Steel <input type="checkbox"/> Type 316L <input type="checkbox"/> Other	<input type="checkbox"/> 1 ft. below land surface <input type="checkbox"/> 1 ft. above land surface	<input type="checkbox"/> 1 ft. above land surface <input type="checkbox"/> 1 ft. below land surface			
WET GRAVEL	25	35	Stratum	Outer diameter _____ mm	Parameter _____ mm	1 ft. below land surface	1 ft. above land surface			
GREY CLAY & GRAVEL	50	85		Inner diameter _____ mm	Length _____ ft.					
SOFT GREY CLAY	5	90		Wall thickness _____ mm	Width _____ mm					
GREY CLAY & GRAVEL HARD	5	95		Material _____	Drive Shoe <input type="checkbox"/> Yes <input type="checkbox"/> No					
COARSE SAND	5	100		Other _____	Other _____					
15. Remarks, elevation, source of data, etc.										
Data Source: Michigan Gravelbed Survey										
17. Rig Operator's Name:										

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REGISTERED BUSINESS NAME: D112

REGISTRATION #:

Address:

State:

AUTHORIZED REPRESENTATIVE:

Date:

WATER WELL AND PUMP RECORD

Fig. 1 of 1

LOCATION OF WELL		75751007001			Tax Parcel #	M57-1					
County	ST. JOSEPH	Township Name	HENRION	Fraction	S 1/4 NE 1/4 SW 1/4	Section	07	Town	05 S	Range	0 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 psf											
Z	FORMATION DESCRIPTION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	CASTING	Steel	Plastic	Threaded	Height Above Surface			
SAND		10	10	Insulated	6.00 in. to 56.0 ft. depth	0.80 in. to 0.0 ft. depth	Welded	0.0 ft.			
SAND & GRAVEL		10	20	Ground Drill Hole Diameter	0.00 in. to 0.0 ft. depth	0.00 in. to 0.0 ft. depth		Weight lbs/ft.			
GRAVEL		10	30		0.00 in. to 0.0 ft. depth			Drive Shoe			
SAND		16	40					1 ft			
CLAY		8	54								
SAND		12	66								
SOFT SAND STOOLY DRILLING AT 86 FT					86						
2. SCREEN											
				Type	Stainless Steel	Diameter	5.00	1 ft. Net Installed			
				Depth	15.000	Length	10.0				
				S.d. between	56.00 ft. in. to 66.00 ft.						
				FITTINGS:	1 Blank	Head Fitter	1 Breather Check				
					above screen	0.0 ft.	Other				
3. STATIC WATER LEVEL:											
				17.00	ft. below land surface			1 ft. 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:											
				CONSTRUCTION:	1) Pitless adapter	1) 12" above grade					
					1) Basement offset	1) Approved pit					
12. WELL CROTON?											
				No	ftiles	From to	ft.				
				1) Heat cement	1) bentonite	1) tucker					
				1) no bags of cement	1) additives						
13. Nearest source of possible contamination											
				Site unknown	Distance	0 ft.	Direction				
				Well disinfected upon completion?	1) Yes	1) No					
				Was old well plugged?	1) Yes	1) No					
14. PUMP: 1) Not installed 1) Pump installation only											
				Manufacturer's name							
				Model number	RP	Volts					
				Length of Prop Pipe	0 ft.	capacity	0 G.P.M.				
				GATE:	1) Submersible	1) McI					
15. PRESSURE TANK:											
				Manufacturer's name							
				Model number	Capacity	0 Gallons					
16. WELLER WELL CONTRACTOR'S CERTIFICATION:											
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.											
17. Remarks, elevation, source of data, etc.											
Data Source: Michigan Groundwater Survey											
18. Rig Operator's Name:											
Address _____											
Signature _____ Date _____											

Data Source: Michigan Groundwater Survey

Data Source: Michigan Groundwater Survey

12. Big Operator's Name:

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WATER WELL AND PUMP RECORD

page 1 of 1

1 LOCATION OF WELL 75751009001		A9		Tax Parcel # MC9-1			
County ST. JOSEPH	Township Name HENDON	Fraction SE 1/4 NE 1/4 SE 1/4	Section 09	Town 05 S	Range 10 W		
Distance And Direction From Road Intersection ABOUT .3 MI. N. OF E. MICHIGAN AVE., ON THE N. SIDE OF FUL LER RD., S16TH FULLER RD., HENDON 49072		1 OWNER OF WELL TOM SCHRODER Address FULLER RD. HENDON, MI 49072 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Street Address & City of Well Location							
Locate with 'X' in Section Below		Sketch Map		4 WELL DEPTH: 93.0 ft.	Date Completed 12/29/77	<input checked="" type="checkbox"/> New Well <input type="checkbox"/> Replacement Well	
				5 <input checked="" type="checkbox"/> Cable tool <input type="checkbox"/> Rotary <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored	<input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Jetted		
				6 USE <input type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Test Well	<input type="checkbox"/> Type I Public <input type="checkbox"/> Type II Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Heat Pump		
				7 CASTING: <input type="checkbox"/> Steel <input checked="" type="checkbox"/> Plastic <input type="checkbox"/> Threaded Diameter: 2.00 in. to 87.0 ft. depth 0.00 in. to 0.0 ft. depth	Height: Above Surface 1.0 ft. Weight lbs/ft.		
				8 SCREEN Type Other Casing 60,000 Set between 80.00 ft. and 93.00 ft.	Diameter 1.25 Length 5.0		
				9 FITTINGS: <input type="checkbox"/> In-Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Bal/Brenner Check <input type="checkbox"/> Blank above screen 1.0 ft. <input type="checkbox"/> Other	Drive Shoe <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
				10 STATIC WATER LEVEL: 40.00 ft. below land surface	<input type="checkbox"/> Flow		
				11 PUMPING LEVELS: 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.			
				12 WELL HEAD COMPLETION: <input type="checkbox"/> Pitless adapter <input type="checkbox"/> 112" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Improved pit			
				13 REAREST SOURCE OF POSSIBLE CONTAMINATION Type Septic Distance 60 ft. Direction NW Well disinfected upon completion? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
				14 PUMP: <input type="checkbox"/> Not Installed <input checked="" type="checkbox"/> Pump Installation Only Manufacturer's name PLINT & WA Model number RP 1 Volts Length of Drop Pipe 76 ft. capacity 8 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name Model number Capacity 8 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.					
Data Source: Michigan Groundwater Survey		REGISTERED BUSINESS NAME 1518				REGISTRATION NO.	
17. Rig Operator's Name:		Address					
		Signed				Date	
		AUTHORIZED REPRESENTATIVE					

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WATER WELL AND PUMP RECORD

LOCATION OF WELL		75751011001	H10	page 1 of 1	Tax Parcel #	MILL-1	
County ST. JOSEPH	Township Name HENDON	Fraction SE 1/4 SW 1/4 NW 1/4	Section 11	Town 05 S	Range 0 N		
Distance And Direction From Road Intersection 2700 FT. W. OF MICHIGAN AVE. 1300 FT. E. OF OSGOOD RD.			OWNER OF WELL MR. CARROLL HAAS C&J FARMS Address PO BOX 248 HENDON, MI 49072 Address Same As Well Location? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Street Address & City of Well Location							
Locate with 'X' in Section Below		Sketch Map		4 WELL DEPTH: <input type="checkbox"/> Date Completed: <input type="checkbox"/> New Well 169.0 FT. <input type="checkbox"/> 07/10/84 <input type="checkbox"/> Replacement Well			
				5 <input type="checkbox"/> Cable tool <input checked="" type="checkbox"/> Rotary <input type="checkbox"/> Driven <input type="checkbox"/> Dug <input type="checkbox"/> Hollow rod <input type="checkbox"/> Auger/Bored <input type="checkbox"/> Jetted _____			
ELEVATION 873.00 ms			6 USE: <input type="checkbox"/> Domestic <input type="checkbox"/> Type I Public <input type="checkbox"/> Type III Public <input type="checkbox"/> Irrigation <input type="checkbox"/> Type II Public <input type="checkbox"/> Heat Pump <input type="checkbox"/> Test Well <input type="checkbox"/> Type IV Public <input type="checkbox"/>				
FORMATION DESCRIPTION		THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	7 CASTING: <input type="checkbox"/> Steel <input type="checkbox"/> Threaded <input type="checkbox"/> Welded <input type="checkbox"/> Height: Above Surface 2.0 ft. Diagonal 6.00 in. to 159.0 ft. depth <input type="checkbox"/> Weight lbs/ft. 0.00 in. to 0.0 ft. depth <input type="checkbox"/> Grouted Drill Hole Diameter 10.00 in. to 169.0 ft. depth <input type="checkbox"/> Drive Shoe <input type="checkbox"/> Yes 0.00 in. to 0.0 ft. depth <input type="checkbox"/> <input type="checkbox"/> No			
TOP SOIL		2	2				
BROWN SANDT CLAY		3	5				
BROWN COARSE SAND & GRAVEL		2	7	8 SCREEN <input type="checkbox"/> Not Installed Type Stainless Steel <input type="checkbox"/> Diameter 6.00 SLOT .025 <input type="checkbox"/> Length 10.0 Set between 159.00 ft. and 169.00 ft.			
GRY CLAY		9	16				
BROWN CLAY & GRAVEL		14	30	9 FITTINGS: <input type="checkbox"/> Packer <input type="checkbox"/> Head Packer <input type="checkbox"/> Bremer Check <input type="checkbox"/> Blank above screen 0.0 ft. Other			
BROWN HARD CLAY		40	75				
GREY GRAVELY CLAY		4	79	10 STATIC WATER LEVEL: <input type="checkbox"/> 2.00 ft. below land surface <input type="checkbox"/> Flow			
GREY CLAY		78	152	11 WELL HEAD COMPLETION: <input type="checkbox"/> Pipeless adapter <input type="checkbox"/> 112" above grade <input type="checkbox"/> Basement offset <input type="checkbox"/> Approved pit			
GREY COARSE SAND & GRAVEL		18	175	12 WELL GROUTED? <input type="checkbox"/> No latex from to ft. <input type="checkbox"/> Cement <input type="checkbox"/> Bentonite <input type="checkbox"/> Other No. of bags of cement _____ Additives _____			
BLUE SHALE (STOFFO)		1	176				
13 Nearest source of possible contamination Type None Distance 750 ft. Direction Well disinfected upon completion? <input type="checkbox"/> Yes <input type="checkbox"/> No Was old well plugged? <input type="checkbox"/> Yes <input type="checkbox"/> No							
14 PUMP: <input type="checkbox"/> Not installed <input type="checkbox"/> Pump installation only Manufacturer's name NAME & NO. Model number RP 10 Volts Length of Drop Pipe 84 ft. capacity 350 G.P.M. TYPE: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet PRESSURE TANK: Manufacturer's name Model number Capacity 350 Gallons							
15. Remarks, elevation, source of data, etc.						16. NATIVE 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.
Data Source: Michigan Groundwater Survey						Address	
17. Rig Operator's Name:						Signed	Date

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