Ontario

Groundwater Resources Study 14

Ontario Geological Survey

An Assessment of Subsurface Sediments in the Central Norfolk Sand Plain; Norfolk and Oxford Counties, Southern Ontario

2014

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Ontario Geological Survey
Groundwater Resources Study 14

by

A.S. Marich[1]

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2014

[1]Earth Resources and Geoscience Mapping Section, Ontario Geological Survey

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Note:

*digital file - the data is available in this digital data release as a separate digital file and is not included in this report

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Abstract

This report provides detailed geological information and interpretation of the central Norfolk sand plain, southern Ontario. The study was undertaken by the Grand River Conservation Authority, Norfolk and Oxford Counties, the Long Point Regional Conservation Authority as well as the Ontario Ministry of Natural Resources and the Ontario Ministry of the Environment in support of a Tier 3 Water Budget and Risk Assessment for the Lake Erie source water protection region. To further the understanding of groundwater resources in the region, a subsurface investigation was completed in the Norfolk–Oxford counties area. Twenty-six continuously cored PQ-diameter (85 mm) boreholes were drilled into bedrock with over 1300 m of drill core collected. Boreholes were drilled in critical areas where previous data was insufficient. The role of the Ontario Geological Survey (Ontario Ministry of Northern Development and Mines) was to log the cores and interpret the findings. From the results of the detailed logging, a conceptual model consisting of 7 sedimentary packages was developed and described for the study area.

The sediments record the complex history of the last major advance and retreat of the Laurentide Ice Sheet into southern Ontario. Glaciolacustrine sediments are the most dominant material present within the study area as the advancing and retreating ice lobes were fronted by large glacial lakes. Three important ice advances are recorded in the till stratigraphy with Catfish Creek Till, Port Stanley Till, and Wentworth Till being recognized. These tills occur as discontinuous lithostratigraphic sheets in the subsurface suggesting episodes of either erosion or nondeposition. Port Stanley Till is the most dominant till unit identified.

Radiocarbon dating of detrital wood and leaves of *Dryas integrifolia* found in deltaic glaciolacustrine deposits overlying Port Stanley Till returned 2 populations of radiocarbon ages: an older suite of ages ranging between 29.45 and 50.6 ka ^{14}C BP and a younger population ranging between 14.06 and 14.7 ka ^{14}C BP. The younger group of dates are the oldest reported postglacial radiocarbon ages from southwestern Ontario and suggest that deglaciation occurred some time prior to this, possibly as early as 15 ka BP.

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Introduction

This report outlines the results of an overburden drilling program completed within the central part of the Norfolk sand plain, southern Ontario. The drilling program was conducted in support of a Tier 3 Water Budget and Risk Assessment, undertaken by the Grand River Conservation Authority (GRCA), Norfolk and Oxford counties, the Long Point Region Conservation Authority as well as the Ontario Ministry of Natural Resources (MNR) and the Ontario Ministry of the Environment (MOE) for the Lake Erie source water protection region. The Tier 3 study was completed in order to assess the quality and quantity of groundwater resources, and to identify any possible issues that may affect the groundwater resources. The local population draws water primarily from private and municipal water wells screened within the Norfolk sand plain sediments. With increasing pressures on groundwater resources, a better understanding of the deep aquifer system is required to properly assess the quality and quantity of deep groundwater within this region.

The study area occupies the central portion of Norfolk County as well as parts of southeastern Oxford County. Access to the study area is via provincial highways 3, 19 and 24 as well as a dense network of township and county roads. The towns of Tillsonburg, Delhi, and Simcoe are located within the study area (Figure 1).

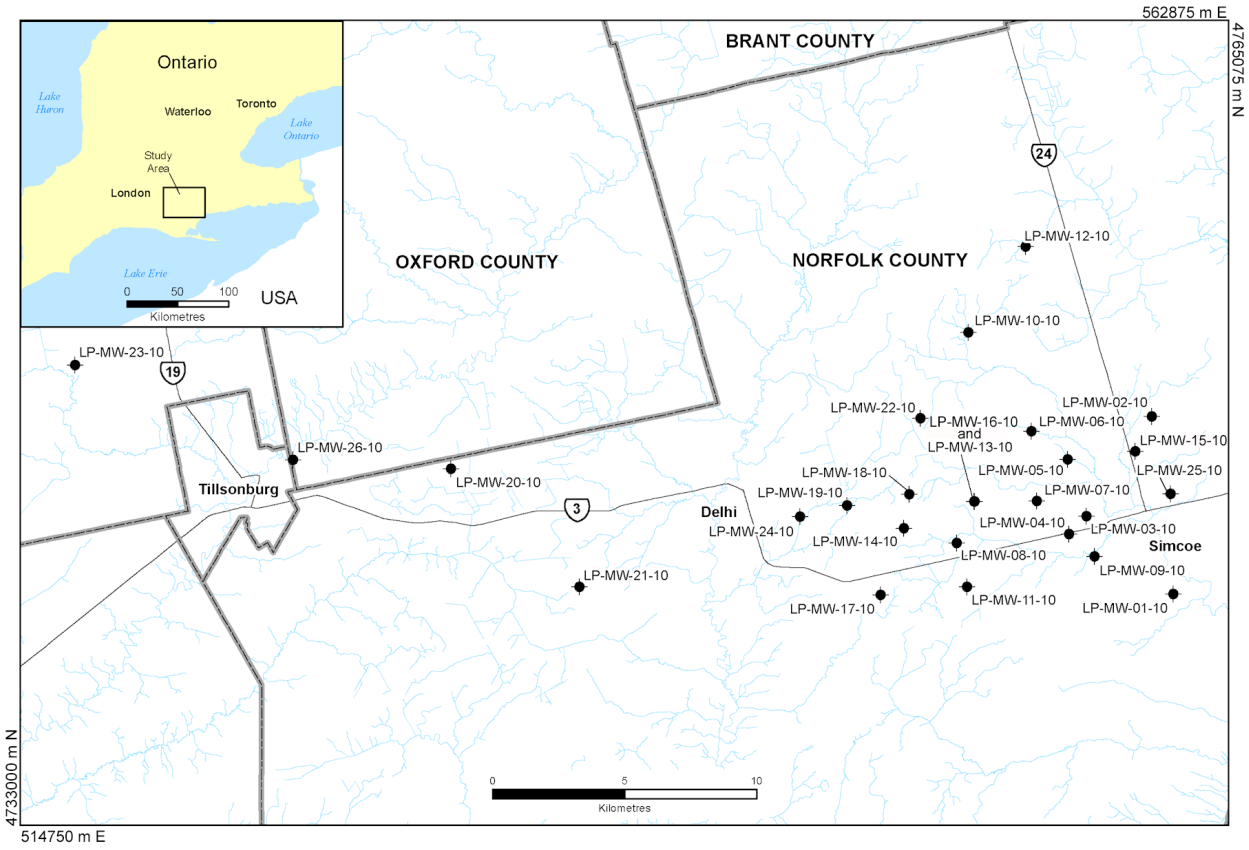

Figure 1. Location map showing the study area in Norfolk and Oxford counties, southern Ontario. The study area is outlined in black on the inset map. The locations of the 26 boreholes are indicated. Note that boreholes LP-MW-16-10 and LP-MW-13-10 are too close to show as separate boreholes.

Bedrock Geology

The bedrock formations underlying the study area are of Upper Silurian to Middle Devonian age. No outcrops of these formations have been identified within the study area (Barnett 1982). The bedrock surface slopes gently southward towards the Lake Erie basin and is overlain by a thick sequence of Quaternary deposits. In some areas the drift is up to 100 m thick.

The oldest bedrock unit is located in the northeastern corner of the study area. The Upper Silurian Salina Group consists primarily of interbedded shale and gypsum with lesser dolostone (Armstrong and Carter 2010; Armstrong and Dodge 2007) (Figure 2). The Upper Silurian Bass Island Formation, overlying the Salina Group, to the south, is a dark brown to grey-tan dolostone. It is variably laminated, mottled, argillaceous and bituminous. The formation varies from very fine to fine crystalline with local intraclastic breccia, evaporitic mineral moulds, minor anhydritic beds and rare thin sandstone beds. The Bass Island Formation grades eastward into the Bertie Formation which consists of dark brown to light grey-tan, very fine- to fine-grained, variably laminated and bituminous, sparsely fossiliferous dolostones and argillaceous dolostones with minor shale (Armstrong and Carter 2010; Armstrong and Dodge 2007).

Overlying the Bass Island and the Bertie formations is the Lower Devonian Bois Blanc Formation. This unit consists of a resistant cherty and fossiliferous limestone with lesser dolostone that disconformably overlies the Silurian strata. The formation is commonly greenish grey to grey-brown, thin to medium bedded and fine to medium textured (Armstrong and Carter 2010; Armstrong and Dodge 2007).

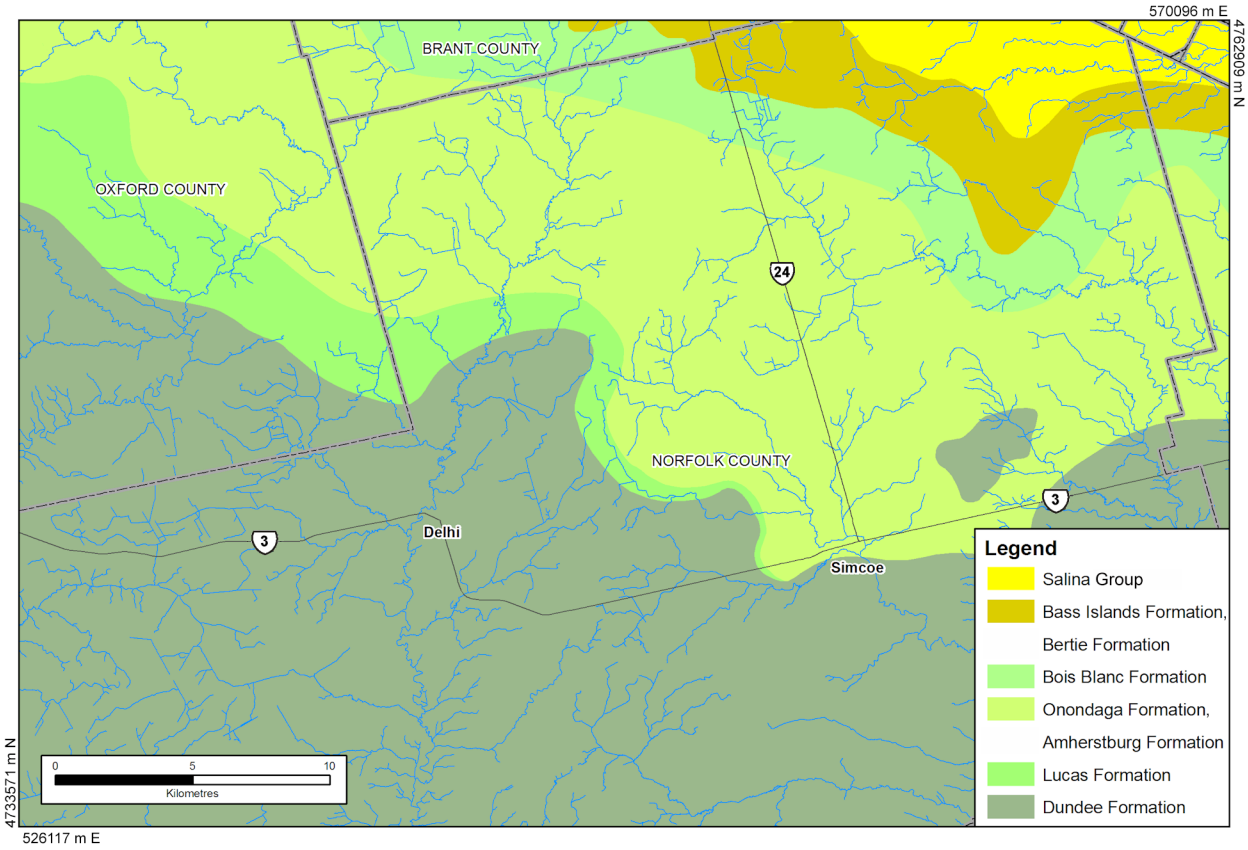

Figure 2. Simplified bedrock geology of the study area, Norfolk and Oxford counties, southern Ontario (*after* Armstrong and Carter 2010).

The Onondaga Formation is found in a band trending southeast in the northern half of the study area (*see* Figure 2). It consists of fossiliferous to argillaceous limestone, sometimes biohermal, and contains cherty sections (Armstrong and Carter 2010; Armstrong and Dodge 2007). The Onondaga Escarpment is located to the north and outside the study area.

The Middle Devonian Amherstburg Formation consists of tan to grey-brown to dark brown fine- to coarse-grained, bituminous, bioclastic, fossiliferous limestones and dolostones. Fossil crinoids, corals, brachiopods and cephalopods are present locally. The Amherstburg Formation grades into the Onondaga Formation to the east exhibiting similar characteristics although with cherty sections (Armstrong and Carter 2010; Armstrong and Dodge 2007).

The Middle Devonian Lucas Formation limestones and dolostones contain anhydritic beds and local sandy limestones. The unit is thin- to medium-bedded, light to dark grey-brown, finely crystalline and contains few fossils.

The Dundee Formation consists of grey to tan to brown, fossiliferous, medium- to thickly bedded limestones with minor dolostones. Chert nodules are locally abundant and the unit exhibits bituminous partings and microstylolites (Armstrong and Carter 2010; Armstrong and Dodge 2007).

Physiography and Quaternary Geology

Chapman and Putnam (1984) identified 3 physiographic regions within the current study area; the Norfolk sand plain, the Horseshoe Moraines, and the Mount Elgin ridges (Figure 3). Most of the study area is dominated by gently undulating glaciolacustrine deposits of the Norfolk sand plain. These sediments were deposited within high-level Erie basin glacial lakes and represent the sandy topset beds of a large delta (Chapman and Putnam 1984). The sand plain dips gently to the south towards Lake Erie.

The Mount Elgin ridges physiographic region is located in the northwest corner of the study area and is represented by the St. Thomas and Norwich moraines (*see* Figures 3 and 4). The ridge crests gradually decrease in elevation from northwest to southeast with local relief being approximately 30 m (Chapman and Putnam 1984). These ridges are cored by the clayey silt of the Port Stanley Till.

A series of near-parallel northeast to southwest-trending moraines protrude up through the Norfolk sand plain southeast of the Mount Elgin ridges physiographic region. From west to east, they are named the Tillsonburg, Courtland, Mabee, Paris, and Galt moraines (*see* Figure 4). The Tillsonburg and Paris moraines are part of the Horseshoe Moraines physiographic region. These moraines, as well as the St. Thomas and Norwich moraines, were likely constructed during either brief pauses in the overall retreat or during slight readjustments of the Erie lobe ice margin.

Glacial History and Stratigraphy

The last major advance of glacial ice into southern Ontario occurred during the Nissouri Phase of the Michigan Subepisode approximately 17 000 to 25 000 years BP (Karrow, Driemanis and Barnett 2000). Deposits predating this advance in southern Ontario are discontinuous and poorly understood.

Catfish Creek Till and associated stratified deposits were laid down by southwest-flowing ice across the study area. The till often displays a compact, stony and sandy texture with up to 25% clasts and is commonly finer grained in the earlier and later lobate phases (Barnett 1992, 1993; Bajc and Dodge 2011). The till is often characterized by high matrix carbonate and a low calcite to dolomite ratio. It is also often

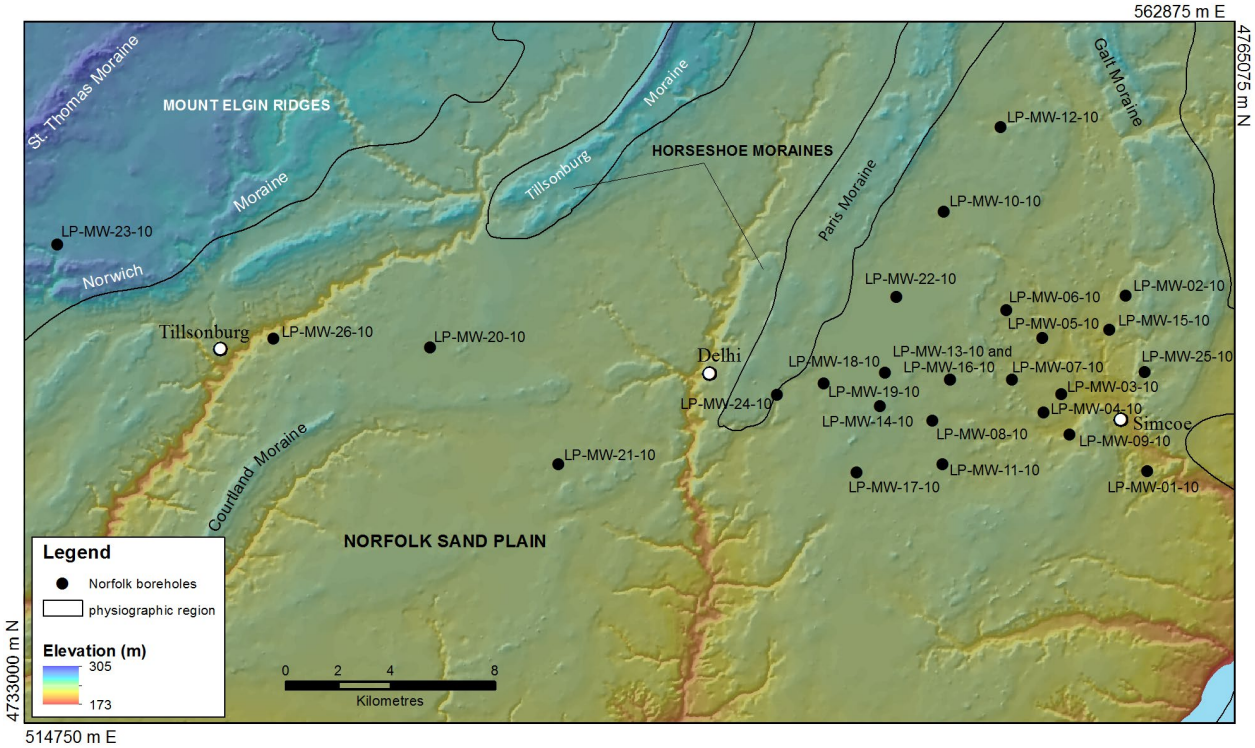

Figure 3. Hillshaded digital elevation model of the study area in Norfolk and Oxford counties, southern Ontario, highlighting important physiographic regions (a*fter* Chapman and Putnam 2007).

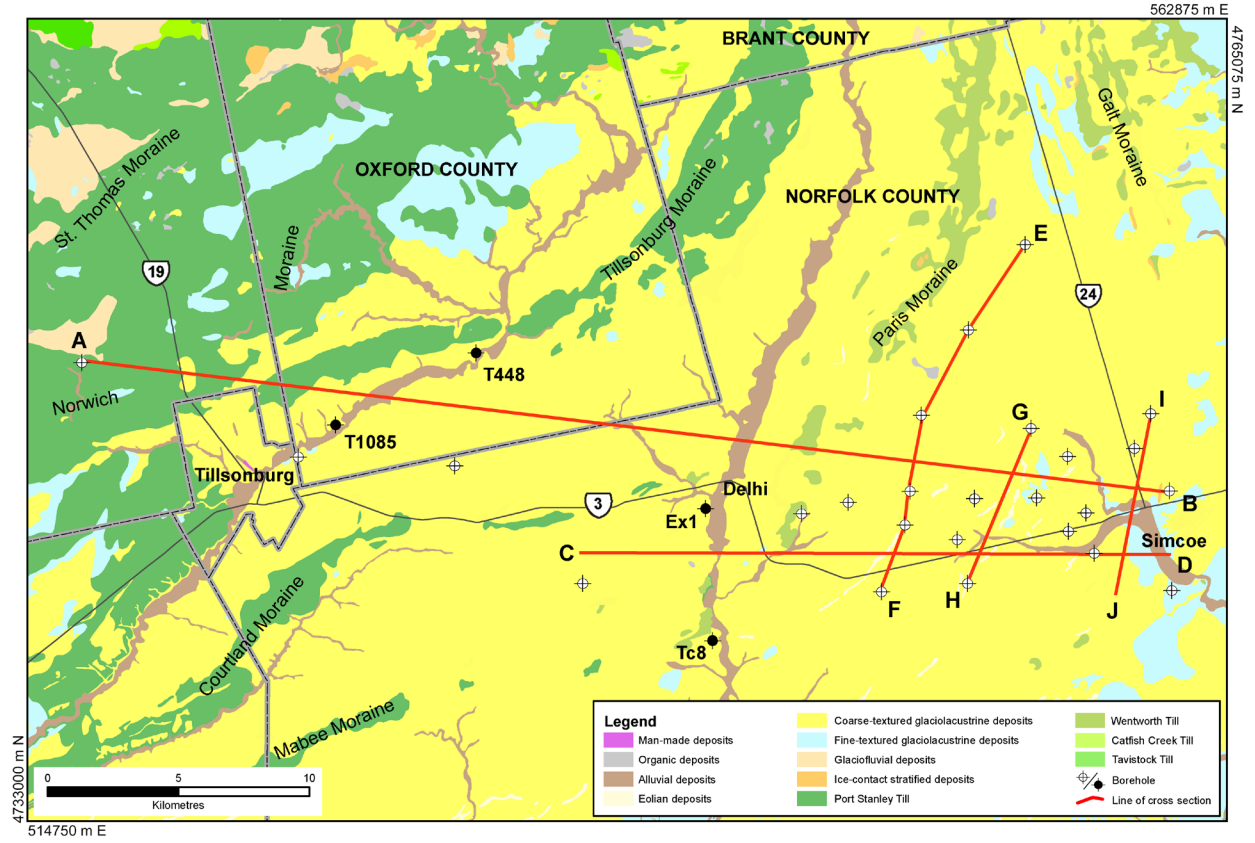

Figure 4. Simplified Quaternary geology of the study area in Norfolk and Oxford counties (*after* Ontario Geological Survey 2010), including locations of boreholes drilled for this study and the cross-section transects included in this report.

associated with coarse-textured glaciofluvial sands and gravels and less often with fine-textured glaciolacustrine deposits that are found above, below and interbedded with the till (Barnett 1992, 1993; Bajc and Shirota 2007; Bajc and Dodge 2011). Catfish Creek Till contains pebbles that indicate a western Grenville Province source area.

Within the study area, the latter stages of Catfish Creek Till deposition occurred by lobate ice flowing out of the Erie–Ontario lake basins. Huron lobe equivalents of Catfish Creek Till were similarly being deposited to the northwest with an ice-free zone developing on the topographic interlake upland known as "Ontario Island". This period of ice withdrawal is referred to as the Erie Phase and occurred approximately 15 000 radiocarbon years BP (Barnett 1982). The extent of ice retreat is not well understood at this time; however, glacial lake deposits attributed to this phase have been identified at the eastern end of the study area. These sediments consist of rhythmically bedded sands, silts and clays and locally of glaciofluvial/glaciolacustrine sands (Karrow, Driemanis and Barnett 2000).

During the Port Bruce Phase, lobate glacial ice overrode the Erie Phase glaciolacustrine and glaciofluvial deposits. The ice margins associated with this readvance are marked by the series of moraines near Tillsonburg and St. Thomas (Barnett 1978, 1982). As the Erie lobe advanced westward, it incorporated the fine-textured Erie Phase glaciolacustrine sediments and redeposited them as stone-poor, silty to clayey Port Stanley Till. Alternatively, the textural difference may reflect a shift in ice flow from the northeast to a more lobate ice flow coming out of the Erie–Ontario basin, where older fine-textured glaciolacustrine deposits and shale are present. In places, the till is interbedded with debris flow deposits and associated stratified sediments as expected in a morainic setting. Port Stanley Till is a clayey silt to sandy silt diamicton with minor grits and granules. The carbonate content of the Port Stanley Till is approximately 38% with a Ca/Do ratio of 1.3 (Barnett 1978). The Courtland and Mabee moraines are composed of Port Stanley Till as well (Barnett 1978, 1993). The Tillsonburg moraine is capped by Port Stanley Till and cored with till interbedded with ice-contact and glaciolacustrine stratified deposits (Barnett 1982; Bajc and Dodge 2011). Barnett (1982) identified an ablation facies of Port Stanley Till along the Norwich, Tillsonburg and St. Thomas Moraines. The ablation facies is coarser textured (39 to 62% sand versus the 12% mean sand content of the till) with a higher stone content, and is no more than 5 m thick and discontinuous in aerial extent. Barnett (1982) also observed at least 4 major and several minor layers of Port Stanley Till in bluff sections along the north shore of Lake Erie. The carbonate content of these till layers increases slightly from the oldest to the youngest deposits. The limit of Port Stanley Till occurs to the northwest of the study area at the Ingersoll moraine (Barnett 1978).

During the latter part of the Port Bruce Phase, as the ice margin retreated eastward from the Norwich Moraine, deltaic sands were deposited in low-lying areas within an Erie basin proglacial lake. Slight fluctuations of the ice margin resulted in the formation of the Tillsonburg, Courtland and Mabee moraines. Continued ice retreat east of the study area followed by a slight readjustment and/or readvance of the ice margin resulted in the deposition of the Wentworth Till and construction of the Paris and Galt moraines. This period of ice withdrawal and readjustment is referred to as the Mackinaw Phase (Barnett 1982). The Wentworth Till a stony, sandy to silty till, generally becomes finer grained towards the south. Total carbonate content and Ca/Do ratio are 38% and 1.3, respectively (Barnett 1982). This till unit is exposed mainly along the crests of the Paris and Galt moraines within the study area. Barnett (1978) observed that the Wentworth Till is sandier in areas around the moraines, and is coarser at river cuts than in lower lying areas. Along the Paris moraine this coarser till can be very bouldery (Barnett 1982). Grain size analyses of Wentworth Till from 2 samples, one near the town of Simcoe and another near Lake Erie showed a lower sand content closer to the lake, by approximately 40% (Barnett, 1982).

The Norfolk sand plain contains a record of late-glacial events in the Lake Erie basin (Chapman and Putnam 1984; Barnett 1982, 1986; Calkin and Feenstra 1985). Initially, a deep water phase existed when fine-textured glaciolacustrine sediments were deposited into glacial lakes Maumee and/or Arkona. Water

levels began to fall as glacial ice pulled back from the Niagara Escarpment, resulting in the deposition of the coarser sands and gravels of the Simcoe Delta. The final readvance of the Erie–Ontario ice lobe blocked low-level outlets resulting in a basin-wide transgression and the establishment of glacial lakes Whittlesey–Warren at approximately 12 000 years BP.

Glacial lakes played a significant role in the development of the sediments and landforms observed today. As indicated above, a series of lakes have been interpreted to have existed within the Erie basin (Barnett 1985). The oldest of which is Lake Maumee (greater than 14 000 years BP) which had various stages, followed by Arkona, Ypsilanti, and Whittlesey–Warren. It is often difficult to distinguish between the sediments of each of these early lakes as there are no marker shorelines or other significant features to correlate the sediments to each lake within the study area. There was a long period where glacial lakes existed in the area, with a transition from one lake to the next, and during these transitions, sediments continued to accumulate within the lake basin. Within the study area, 3 sediment packages relating to the series of glacial lakes have been identified. The first is a package of fine-textured basinal deposits associated with glacial lakes Maumee and Arkona, the second a coarse-textured low-water phase package associated with Lake Ypsilanti, and the third, a basinal sediment package representing deposition in Whittlesey–Warren lakes.

Bedrock Topography and Drift Thickness

The bedrock surface underlying the study area dips gently to the south and southeast towards Lake Erie and ranges in elevation from 220 m asl to 150 m asl (Figure 5). The most predominant bedrock valleys occur at Tillsonburg and Delhi along the current course of modern rivers. These valleys are approximately 15 to 20 m deep.

The thickness of sediment within the study area is variable and ranges from 74 m at the Norwich Moraine to approximately 22 m within the river valley at Tillsonburg. It is thickest to the west and south, and in areas near the moraines (Figure 6). In several instances, bedrock topography appears to have influenced the amount of erosion or deposition of sediments. For example, it has been observed that in some cases Catfish Creek Till thickens in areas of bedrock depressions where it has escaped erosion by subsequent ice advances.

Overburden Drilling

Logging and interpretation of the 26 boreholes drilled for this study revealed a stratigraphic sequence that reflects a fluctuating ice margin within a glacial lake setting. Each borehole was logged and photographed in detail, and sampled for grain size, carbonate, pebble lithology and organic content. Locations of the boreholes are shown in Figure 4. Graphic logs for the boreholes are presented in Appendix 1 and detailed written logs are contained in Appendix 2. Results for the grain size and carbonate analyses as well as pebble lithologies are found in Appendixes 3, 4 and 5, respectively.

These borehole records were used to formulate a conceptual subsurface model of the various sediment packages within the study area.

A series of 26 PQ-diameter (85 mm) continuously cored boreholes were drilled to bedrock between September 2010 and January 2011. Borehole depths ranged between 29 and 67 m with approximately 1300 m of drill core being collected. Following collection, the drill cores were shipped to the Ontario Geological Survey in Sudbury for detailed logging and sampling. All samples were analysed for grain

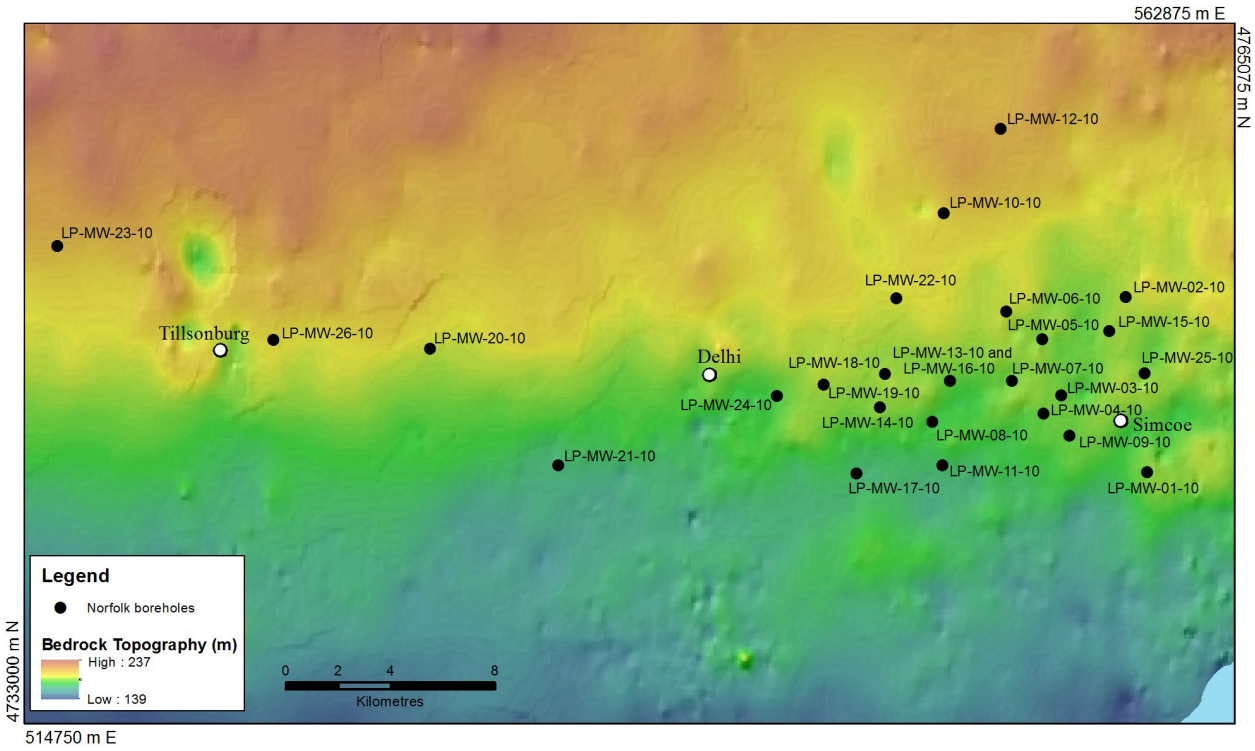

Figure 5. Hillshaded bedrock topography of the study area Norfolk and Oxford counties, southern Ontario (after Gao et al., 2006).

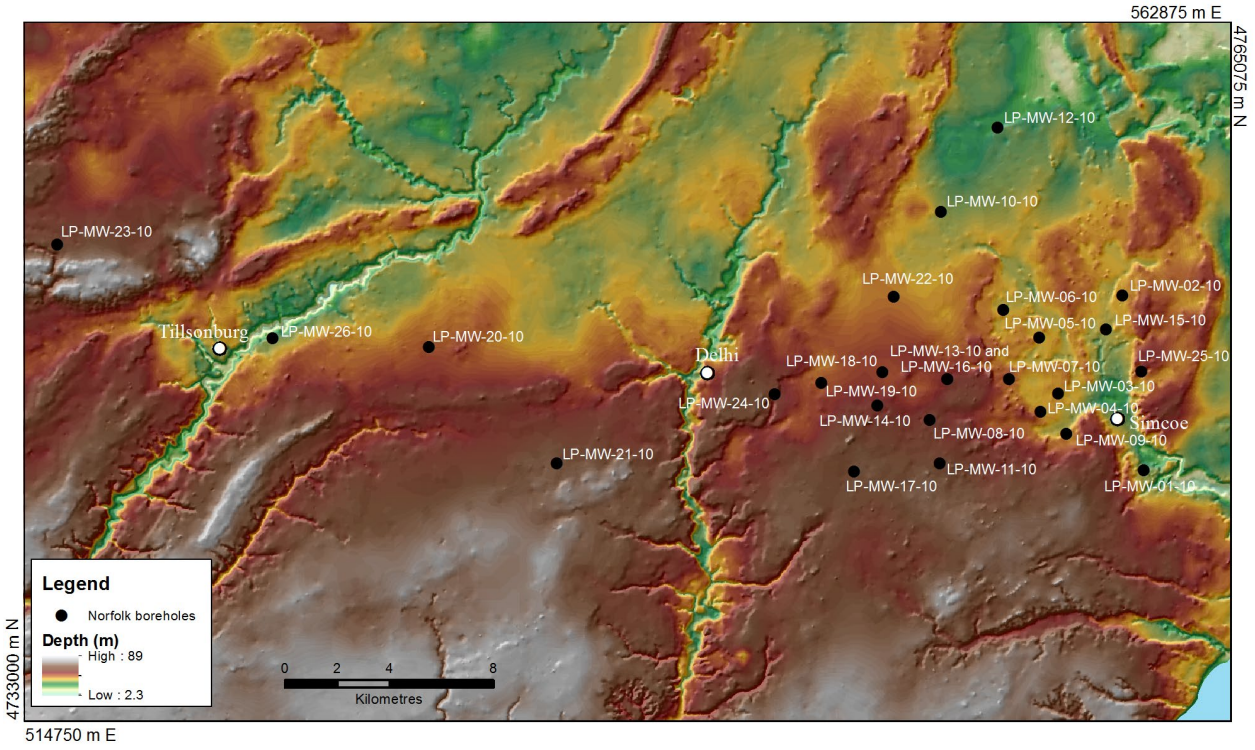

Figure 6. Drift thickness for the study area in Norfolk and Oxford counties, southern Ontario. Drift thickens to the west and south (*after* Gao et al., 2006).

size while the diamicton samples were analyzed for carbonate content as well. The tests were completed by the Ontario Geological Survey Geoscience Laboratories in Sudbury. Pebbles were collected from the various diamicton units for lithological identification and provenance determination. In addition, 13 samples of detrital wood and *Dryas integrifolia* leaves were collected and sent to the Illinois State Geological Survey for radiocarbon (^{14}C) dating by accelerator mass spectrometry (AMS).

Conceptual Geological Model

The sediments encountered in this study record the complex history of the last main advance and retreat of the Laurentide Ice Sheet into and from southern Ontario. At the surface, moraines mark the limits of minor readvances or stillstand positions of the margin of the retreating Erie ice lobe, while a complex history of deposition and erosion of sediments is contained within the subsurface sediment record.

A series of 5 cross sections were created by making some inferences regarding the spatial extent of key sedimentary sequences observed within the borehole records (Figure 7). In addition to the 26 borehole records acquired as part of this study, 3 surface exposures and one additional borehole record obtained from previous Ontario Geological Survey (OGS) projects were incorporated into the cross section interpretations. The additional records (Barnett 1982 and P.J. Barnett (OGS) unpublished data, 2013) were beneficial in providing information in areas where the more recent drilling were lacking. The cross sections are included in the GRS 14 digital release and are referred to in the following sections.

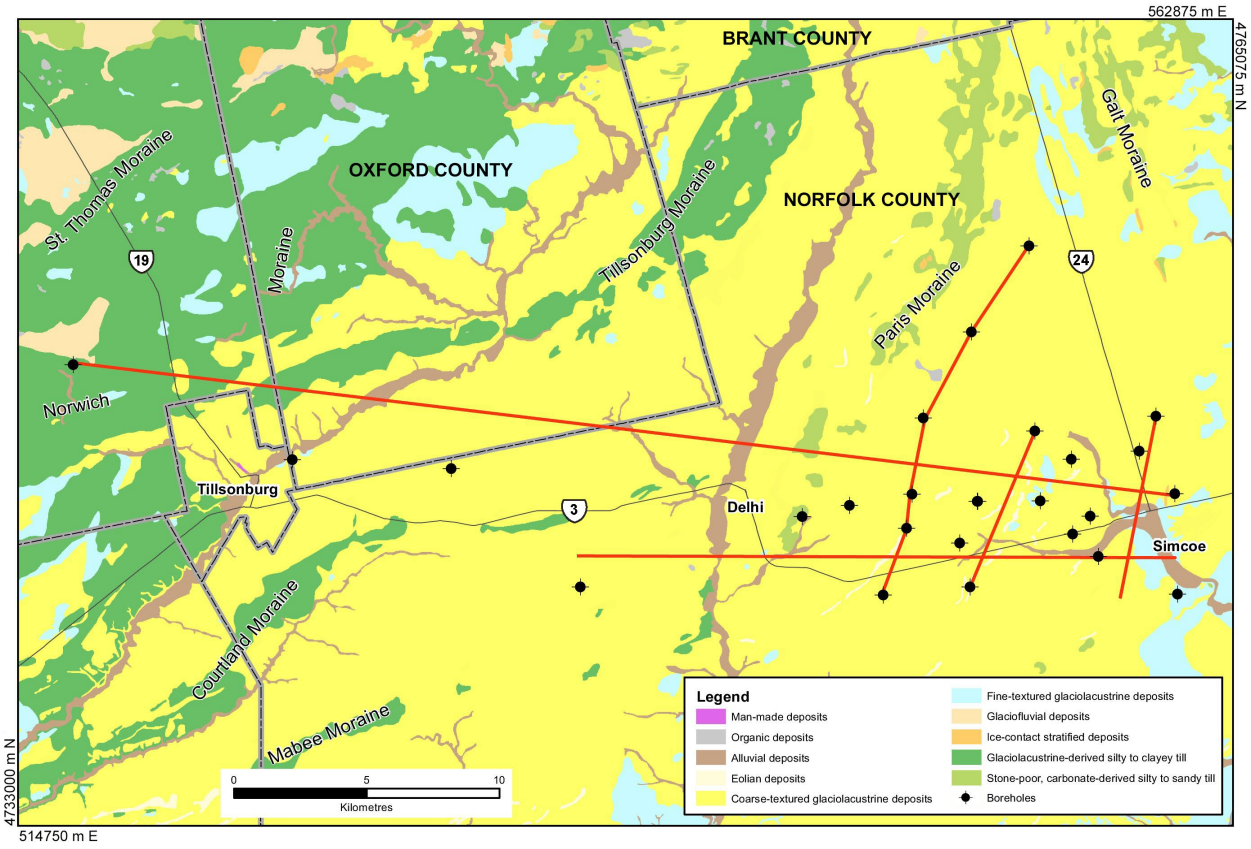

Figure 7. Quaternary geology map of the study area, Norfolk and Oxford counties, showing the location of transects relative to the boreholes used for the cross sections in this study.

Seven sedimentary units of varying degrees of thickness and continuity have been identified within the study area. These units are listed below from oldest to youngest.

- 1. Catfish Creek Till
- 2. Erie Phase deposits
- 3. Port Stanley Till
- 4. Fine-textured Erie basin deposits (glacial Lakes Maumee, Arkona)
- 5. Coarse-textured Lake Ypsilanti low level deposits
- 6. Fine- to medium- textured Erie basin deposits (Whittlesey–Warren lakes)
- 7. Wentworth Till

Figure 8 shows a schematic of the conceptual model depicting the relationships between the sediment packages identified in the borehole records. The model depicts a subsurface environment that is dominated by glaciolacustrine sediments of variable continuity. These glaciolacustrine deposits are interrupted by the 3 till units; the Catfish Creek Till which is mostly continuous to the west; the Port Stanley Till which exhibits at least 3 main beds that rise up through the subsurface to the west; and the Wentworth Till which was observed in a single borehole on the crest of the Paris Moraine. These sedimentary packages as a whole reflect a glaciolacustrine environment associated with a fluctuating ice margin.

SEDIMENTARY PACKAGES

The sediments identified from the logs of the 26 boreholes sampled are subdivided into 7 sedimentary packages. These packages, the sediments they comprise, as well as their distribution are described in the following section from oldest to youngest.

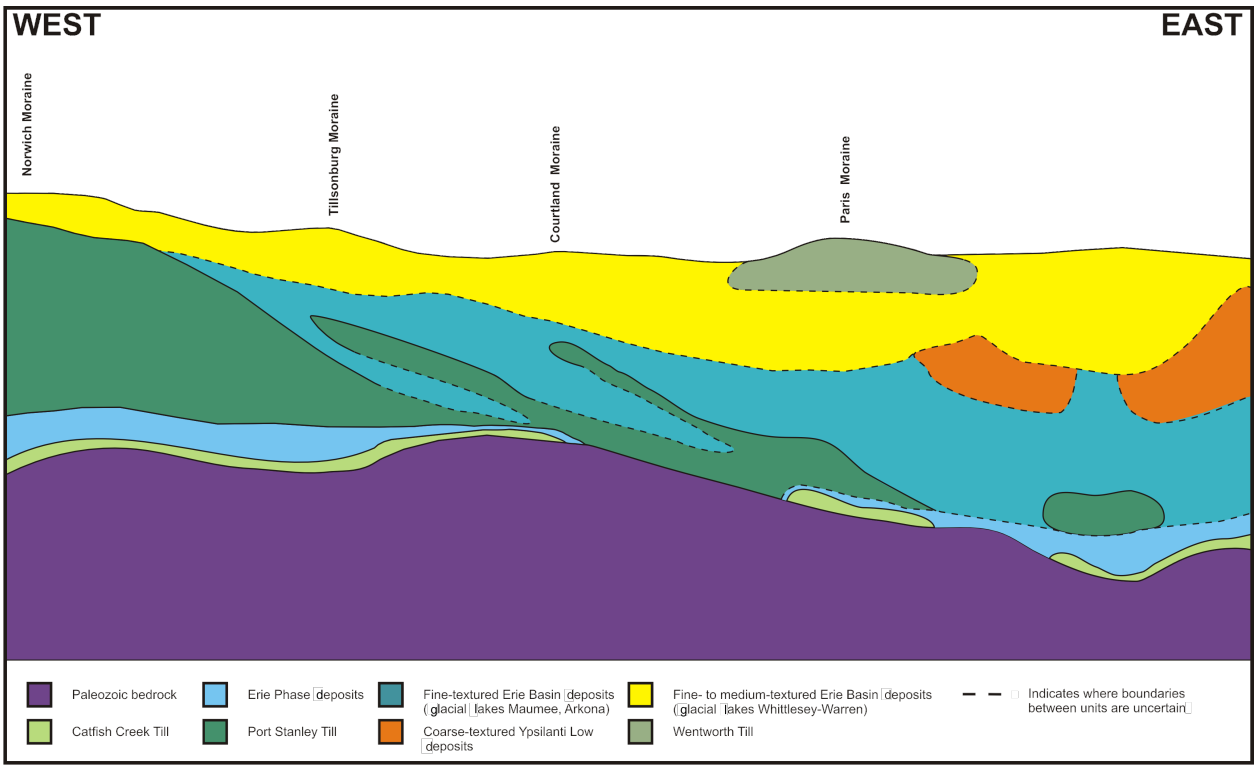

Figure 8. Generalized conceptual geologic model for the central Norfolk sand plain, Oxford and Norfolk counties. This cross section is oriented from west to east. Seven sedimentary units are identified including 3 tills and 4 glaciolacustrine deposits.

Catfish Creek Drift (Nissouri Phase)

Catfish Creek Till and the associated stratified deposits were identified in 17 of the 26 boreholes. This is a thin sediment package that varies in thickness from less than 1 m to approximately 10 m. It represents the oldest drift sequence identified to date in the study area. Catfish Creek Till is a massive, compact, sandy silt diamicton and is grey-brown with an occasional mauve tint. It contains 5 to 20% subangular grits and pebbles (Photo 1). Grain size analyses indicate the sediment texture varies from 5 to 70% sand, 25 to 60% silt and 0 to 40% clay. Table 1 summarizes grain size data for each till unit observed in this study. Ternary plots of till grain sizes are presented in Figure 9.) Catfish Creek Till is sometimes interbedded with silt, clay and very fine-textured sand and minor gravel. Clasts within the till are dominated by limestone with lesser dolostone and minor Precambrian lithologies. Limestone content is generally greatest near the bedrock surface. The carbonate content of the till varies between 45 and 65%.

Catfish Creek Till is generally thicker to the north and northwest within the study area, and thins to the southeast and southwest. Along the east-west trending cross section A-B, Catfish Creek Till sits directly above bedrock, and is very thin (1 m or so) and continuous from the west to the central portion of the cross section where it thickens slightly. Thin lenses of this sediment package are observed at the east end of the cross section where it thins and is overlain by fine-textured glaciolacustrine sediments.

Table 1. A summary of grain size data for the till units in the Norfolk and Oxford counties study area.

Till Unit	Number of Samples	% Sand	% Silt	% Clay	
Catfish Creek Till	31	42.02	42.37	15.61	Median
		4.7-72.87	25.8-64.97	0.0-39.54	Range
Port Stanley Till	91	15.81	56.88	28.41	Median
		0.0-80.18	14.31-77.24	3.39-45.12	Range
Wentworth Till	14	18.07	57.18	24.75	Median
		0.30-41.12	47.78-66.06	4.74-39.42	Range

Photo 1. Typical core sample of Catfish Creek Till: massive, compact sandy silt diamicton with approximately 20% grits to granular gravel (Borehole LP-MW-03-10).

Along cross section G-H, the Catfish Creek Drift is very thin and discontinuous. The till thickens slightly at LP-MW-16-10 where there is a slight depression in the bedrock. The bedrock surface along this cross section dips from north to south. Along cross section I-J the sediment package is slightly thicker than in cross section G-H to the west. In contrast to the other cross sections presented here, where the bedrock is depressed along this section, the Catfish Creek till thins and/or becomes absent.

Catfish Creek Till was deposited by an ice sheet located to the east and northeast which extended westward across the study area. The sand content within the till decreases slightly towards the west, where the till is most often associated with fine-textured glaciolacustrine sediments. This is reflected in the silt content of the till which is generally greatest to the west.

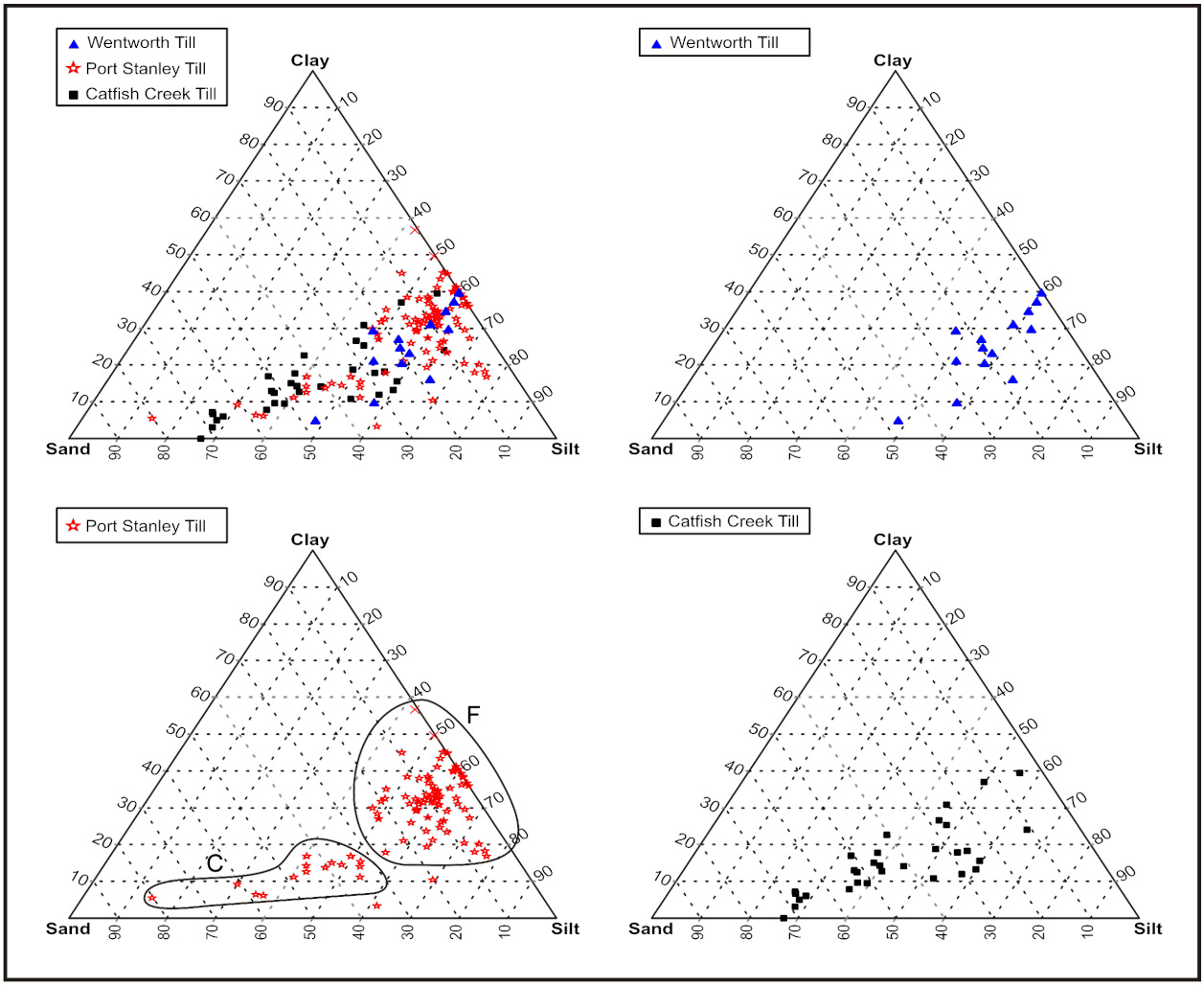

Figure 9. Ternary plots of grain size data for the Wentworth, Port Stanley and Catfish Creek tills. Black lines on the ternary plot for Port Stanley Till outline the possible coarse (C) and fine facies (F) populations for the till.

Erie Phase Deposits

The Erie Phase deposits observed within the study were identified in 13 of the 26 boreholes. These deposits consist of basinal glaciolacustrine clays and silts, silty fine- to very fine-textured sands as well as rhythmically laminated silts and clays and silts and sands (Photo 2). Dropclasts and ice-rafted debris were commonly observed throughout the sequence. The sediments were observed throughout the study

area, although they are quite discontinuous. Lenses of Erie Phase sediments were observed within the east-central portion of the study area (boreholes LP-MW-05-10, LP-MW-07-10, and LP-MW-04-10). They gradually become discontinuous towards the east. The thickest of these deposits occurs in the northwest at LP-MW-23-10 where up to 17 m was observed and thins towards the east-central part to 1.5 to 2.0 m and thickens slightly at the eastern end of the study area where between 3 and 4 m were encountered. Along cross section A-B, Erie Phase deposits appear continuous in the western two-thirds of the cross section, become truncated by Port Stanley Drift at LP-MW-24-10, and are continuous again at the eastern end of the cross section, where they are overlain by Port Stanley drift and younger glaciolacustrine sediments. Erie Phase deposits occupy the eastern end of cross section C-D. Where Port Stanley Till is missing in the sediment record it is difficult to differentiate the Erie Phase deposits from younger glaciolacustrine deposits. The Erie Phase sedimentary package is preserved as a more continuous unit along cross section I-J.

Photo 2. Typical borehole sample of Erie Phase glaciolacustrine deposits: massive, to finely laminated silts to clayey silt containing ice-rafted debris (Borehole LP-MW-18-10).

The Erie Phase deposits possibly indicate the extent to which the ice responsible for late lobate facies of Catfish Creek Drift retreated to the northeast and east. Proglacial lakes formed and thick deposits of fine-textured glaciolacustrine sediments were laid down in the deep, calm waters of the proglacial lake. The ice retreated at least as far as the modern day Lake Erie Shore bluffs east of Port Dover, east and south of the study area (Barnett 1993).

Port Stanley Drift (Port Bruce Phase)

Port Stanley Drift consists of Port Stanley Till interbedded with glaciolacustrine fine-textured sediments, and minor gravel. These predominantly fine-textured sediments may represent a change from regional ice flow from the northeast to a more lobate flow originating in the Erie–Ontario basin where pre-existing fine-textured glaciolacustrine deposits and shale exist. Alternatively, it may simply reflect a change in depositional environment becoming more glaciolacustrine dominated.

Port Stanley Till is a sandy silt to clayey silt diamicton owing to its derivation from fine- to medium-textured glaciolacustrine sediments. It is a compact, grey-brown till with approximately 10 to 15% grits

to cobble gravel, with clasts sub-rounded to rounded and polished (Photo 3). Clast lithology is dominated by limestone. The till is predominantly massive, but some minor silt stringers were observed. Two possible facies of Port Stanley Till were observed based on the grain size analysis. The coarser, sandier facies varied from approximately 30-60% sand, 30-60% silt, and 5-20% clay (*see* Figure 9). The siltier facies consisted of approximately 20-55% sand, 45-80% silt and 10-45% clay. Similarly, 2 facies of Port Stanley till were observed by Barnett (1982). The carbonate content of the till varies from 30 to 55%, with the highest carbonate content occurring where the till sits directly on bedrock.

Photo 3. Borehole sample of Port Stanley Till: sandy silt to clayey silt diamicton with 10 to 15% grits to cobble gravel (Borehole LP-MW-01-10).

Port Stanley Drift is located in patches throughout the study area and varies from approximately 1 m to greater than 40 m in thickness. The thickest sequence occurs at LP-MW-23-10 which is located between the Tillsonburg and Norwich moraines in the northwestern portion of the study area. The till thins to the east possibly in response to rapid withdrawal of the ice sheet due to calving in the deep lake basin.

Port Stanley Drift was identified in 15 of the 26 boreholes. A continuous till sheet exists along cross section A-B from northwest of the Tillsonburg Moraine to just east of the Paris Moraine. The till sheet thins from northwest to southeast along this cross section. The unit thickness decreases and increases in steps from northwest to southeast that may represent former ice margins where significant thicknesses of diamicton accumulated. The entire drift package suggests fluctuations in the ice margin position as the till was being deposited. Barnett (1982) identified several distinct sheets of Port Stanley till rising up through the sedimentary sequence to the west. Three of these sheets have been interpreted in cross section A-B in the current study. Cross section C-D shows a thick package of Port Stanley Drift to the west which terminates in glaciolacustrine fine to coarse-textured Erie basin deposits. Port Stanley Drift continues at the east end of the cross section. Two narrow lenses of Port Stanley Till were interpreted along cross section E-F and may represent the erosional remnants of a once more extensive till sheet. The till was identified in boreholes LP-MW-10-10 and LP-MW-18-10.

Two lenses of Port Stanley Till also occur at LP-MW-06-10 and LP-MW-07-10 along cross section G-H. Similarly 2 lenses were interpreted in the southern half of cross section I-J. These discontinuous lenses of Port Stanley Till reflect the discontinuous nature of this aquitard. The sand content of Port Stanley Till increases just east of the Paris moraine, becoming siltier in the eastern-most reaches of the study area.

Erie Basin Glaciolacustrine Deposits

Glaciolacustrine sediment deposits dominate the subsurface stratigraphy of the study area. Three packages have been identified and are associated with the various glacial lakes that occupied the area. Each sediment package varies in horizontal continuity and is more discontinuous to the east.

The oldest sediment package is associated with glacial Lakes Maumee and Arkona and is a fine-textured glaciolacustrine deposit. This deposit consists of silt and clay, as well as laminated silt, clay and fine-textured sand. Rhythmically bedded sequences and ice-rafted debris were also observed (Photo 4). The sediment exhibited various degrees of disturbance, ranging from horizontal/subhorizontal beds to highly deformed and convoluted beds. Glacial lakes Maumee and Arkona sediments occur in 18 of the 26 borehole records and vary in thickness from approximately 5 to 25 m. These deposits occur most commonly in the eastern half of the study area.

Photo 4. Rhythmically laminated silt and clay with abundant ice-rafted debris. Dark brown beds at approximately 14.05 m and 14.20 m have been interpreted as winter layers of annual rhythmites (varves). This photograph shows a typical sample of sediments deposited within glacial lakes Maumee and Arkona (Borehole LP-MW-01-10).

Overlying the deposits of lakes Maumee and Arkona are the channelized Lake Ypsilanti low-water phase deposits. These deposits occur primarily within the eastern half of the study area and were identified in 15 borehole records. Ypsilanti low-water phase deposits consist of medium- to coarse-textured sands and gravels with minor fine-textured laminated sands. This marker unit serves to differentiate fine-textured sediments of glacial lakes Maumee and Arkona from those of glacial lakes Whittlesey–Warren.

Pea- to cobble-size gravel units were identified in 5 of the boreholes, LP-MW-01-10, 02-10, 05-10, 15-10 and 24-10. These gravel beds are interbedded with silty fine- to coarse-textured sand or clayey silt. The gravels are granular to cobble in size, subrounded to rounded and polished, predominantly limestone, with very minor granite clasts (Photo 5). The matrix of these gravels is a silty, medium- to coarse-textured sand, and the gravel unit itself is very poorly compacted. The presence of these gravel beds were documented in boreholes at the north and south ends of cross section I-J, and the east end of cross section A-B. Their discontinuous nature suggests that they may fill channels extending southward into the Erie basin.

Photo 5. Typical pea- to cobble-size gravel bed within the Ypsilanti low-water phase deposits. Clast lithology is dominated by limestone and the matrix sediment is medium- to coarse-textured sand (Borehole LP-MW-01-10).

The fine- to medium-textured Whittlesey–Warren glacial lake deposits were identified within 24 of the borehole records, and are commonly the uppermost sediment package. These are deltaic sediments and show at least 1 and up to 3 coarsening upward sequences within each borehole record. These coarsening upwards sequences occur as rhythmically laminated clays and silts coarsening to medium-textured sand (Photo 6), or fine-textured sands coarsening to coarse-textured sands (Photo 7). Within the rhythmically laminated sediments 10 to 55 varves were counted.

Photo 6. Typical medium- to coarse-textured sands deposited in Whittlesey–Warren glacial lakes (Borehole LP-MW-03-10).

Photo 7. Fine- to medium-textured laminated sands deposited within Whittlesey–Warren glacial lakes. Heavy mineral streaking common throughout the deposit. Minor to rare silt or clay laminae were observed, e.g., at approximately 18.30 m (Borehole LP-MW-03-10).

Wentworth Drift

Wentworth Drift was observed at a single borehole (LP-MW-24-10) located on the crest of the Paris moraine. This package of sediments is 24 m thick at this location. Wentworth drift consists of Wentworth Till interbedded with silts, very fine-textured sands, and clay. Three beds of Wentworth Till were identified in this borehole and probably represent stacked debris flows or flow till deposited along an ice margin fronted by a glacial lake. Sands and gravels underlying the diamicton sequence were likely deposited along the ice margin where subglacial meltwaters entered the lake possibly as a subaquatic fan. Similar sequences were observed along the Paris and Galt moraines to the north in the Brantford–Woodstock area (Bajc and Dodge 2010).

The Wentworth Till is a grey to brown with mauve hue, massive, sandy silt diamicton containing minor grits, granules and silt laminae (Photo 8). The fine texture of Wentworth Till is likely a result of the incorporation of glaciolacustrine sediments into the base of the glacier where they were reworked and subsequently deposited as till. The Wentworth Till coarsens upwards slightly through the sediment profile, while the carbonate content is almost uniform throughout.

Wentworth Till and the associated glaciolacustrine sediments are associated with a fluctuating ice mass that was retreating to the east. These fluctuations in the ice margin position can be correlated to the fine-textured glaciolacustrine sediments interbedded with Wentworth Till. Three beds of Wentworth till were identified, each separated by varying thicknesses of silt and very fine-textured glaciolacustrine sands (*see* LP-MW-24-10 Appendix 1).

Photo 8. Borehole core sample of Wentworth Till. Massive, slightly sandy, clayey silt diamicton containing minor grits, granules and silt laminae (Borehole LP-MW-24-10).

Hydrogeological Implications

Looking at the sedimentological evidence alone, it is possible to conclude that the discontinuous nature of fine-textured glaciolacustrine sediments would allow for groundwater to move throughout the sediment column. Slug test data obtained from Matrix–Solutions indicate that there is very little if any difference in water levels between aquifers that occur at different levels and that are separated by aquitards. This suggests that the aquitards are discontinuous (Matrix–Solutions, personal communication, September 2012).

The connection between sand units will allow ground water to pass through the subsurface but will also allow for the migration of contaminants from surface aquifers into deeply buried ones. Tills and very fine-textured glaciolacustrine sediments may serve locally as aquitards, but not as broad regional aquitards.

Radiocarbon Dating

Thirteen samples of detrital *Dryas integrifolia* leaves and wood fragments found within the glaciolacustrine sand deposits were isolated and were age dated by AMS radiocarbon dating. This resulted in numerous dates greater than 30 000 radiocarbon years before present (BP) (Table 2). All of the radiocarbon dates obtained for the detrital wood are greater than 29 450 ^{14}C BP. This suggests abundant recycling of older, pre-Late Wisconsinan organic deposits. Numerous *in situ* deposits of this age have been encountered to the north below the Catfish Creek Till (Bajc and Dodge 2011). Of particular interest are the numerous dates on well preserved delicate leaves of *D. integrifolia,* a colonizing shrub commonly encountered in early deglacial sites, that returned radiocarbon ages ranging between 14.06 and 14.71 ka ^{14}C BP. The oldest previously reported postglacial date from southwestern Ontario was obtained from the Vanderven site where Mackinaw Phase sediments containing *D. integrifolia* leaves were age dated at 13 630±440 ^{14}C BP (Warner and Barnett 1986; Karrow et al., 2007). The dates reported here indicates ice-free conditions in southwestern Ontario prior to 14.7 ka BP. Tundra vegetation was likely established in the Ontario island area at this time with spruce forest vegetation being established by

about 13.2 ka BP (Karrow et al., 2007). The sediments containing the *D. integrifolia* leaves are younger than 14.7 ka BP, and the Port Stanley Till may be at least this old or substantially older.

Table 2. List of radiocarbon dates obtained for detrital *D. integrifolia* and wood fragments found within glaciolacustrine sand deposits.

Lab Sample #	Borehole	From (m)	To (m)	Material	$\delta^{13}C$	Fraction of MC	±	$D^{14}C$	±	^{14}C yr BP	±
A2465	LP-MW-03-10	17.50	19.00	Wood	-26	0.0031	0.0009	-996.9	0.9	46400	2200
A2466	LP-MW-06-10	26.75	28.00	Wood	-26.6	0.0256	0.0009	-974.4	0.9	29450	270
A2467	LP-MW-08-10A	22.75	24.25	Wood	-25.1	0.0022	0.0009	-997.8	0.9	49100	3100
A2468	LP-MW-08-10B	22.75	24.25	Dryas	-27.2	0.1602	0.0009	-839.8	0.9	**14710**	50
A2469	LP-MW-09-10	24.75	25.75	Dryas	-27.1	0.1702	0.0009	-829.8	0.9	**14225**	45
A2470	LP-MW-10-10	18.00	19.50	Wood	-26.6	0.0004	0.0009	-999.6	0.9	>49700	
A2471	LP-MW-12-10	6.00	7.50	Wood	-27.6	0.0123	0.0009	-987.7	0.9	35360	570
A2472	LP-MW-13-10	35.00	36.50	Wood	-25.3	0.0007	0.0009	-999.3	0.9	>48500	
A2473	LP-MW-14-10	36.00	36.50	Dryas	-27.6	0.1737	0.0009	-826.3	0.9	**14060**	45
A2474	LP-MW-16-10	30.00	34.50	Dryas	-26.8	0.1726	0.0009	-827.4	0.9	**14110**	45
A2475	LP-MW-18-10	28.50	31.50	Dryas	-28.9	0.8206	0.0019	-179.4	1.9	1590	20
A2476	LP-MW-24-10	39.97	40.02	Wood	-27.8	0.0018	0.0009	-998.2	0.9	50600	3700
A2477	LP-MW-25-10	20.50	23.50	Dryas	-27.8	0.1715	0.0009	-828.5	0.9	**14165**	45

Note: Dates highlighted in bold typeface are the oldest reported dates obtained to date from post-glacial sediments in southern Ontario. The youngest date of 1590 ^{14}C years BP is likely contaminated by modern carbon.
MC = Modern carbon.

Summary

This study revealed a complex series of sediment packages that record events from the final glaciation of southern Ontario approximately 17 000 to 25 000 years ago until present. The boreholes drilled for this project have further expanded the understanding of the late Quaternary history of the area.

The oldest sediments identified within the study area are those attributed to the Nissouri Phase Catfish Creek Drift. Catfish Creek Till and related glaciolacustrine deposits have been preserved in discontinuous lenses and beds throughout the study area and generally rest on the bedrock surface. The glacial ice responsible for the deposition of Catfish Creek Drift retreated into the Lake Erie basin during the Erie Phase with subsequent deposition of fine-textured glaciolacustrine sediments. These Erie Phase glaciolacustrine deposits are discontinuous but are found in many parts of the study area. Following the Erie Phase, the Port Bruce Phase marks the subsequent readvance of glacial ice and deposition of Port Stanley Drift. Port Stanley Till was identified throughout the study area, but is most continuous to the northwest. This fine-textured compact till reflects the reworking of Erie Phase glaciolacustrine sediments. Interpretation of borehole records reveal several beds of Port Stanley Till, interbedded with glaciolacustrine sediments which suggests a fluctuating ice margin fronted by a glacial lake.

Following the Port Bruce Phase, ice pulled out of the study area, and the area was dominated by glaciolacustrine sediment deposition. These Erie basin deposits are the most dominant sediments within the study area and have the greatest influence on the present day landscape. These sediments are also the most important source of groundwater for local residents. The Erie basin deposits have been subdivided

into 3 separate depositional units. The oldest includes the fine-textured silts, clays and fine-textured sands deposited within glacial lakes Maumee and Arkona. The second unit is a low-water phase deposit of coarser-textured sands and gravels that were deposited in channels entering glacial lake Ypsilanti. There is usually an abrupt transition from the earlier Erie basin deposits into the Ypsilanti low-water phase deposits suggesting a relatively sudden drop in lake levels. Water levels rose again as the outlet that was responsible for draining meltwater from Lake Ypsilanti became blocked by advancing ice. The resulting Erie basin deposit is a sequence of fine-textured glaciolacustrine sediments including a series of coarsening upwards deltaic sediments deposited within the glacial lakes Whittlesey–Warren.

A final fluctuation or minor readvance of glacial ice into the study area resulted in the deposition of Wentworth Till. This till unit is confined to an area along the crest of the Paris Moraine and further to the east along the Galt Moraine. Wentworth Till is a sandy silt diamicton and is interbedded with glaciolacustrine silts, very fine-textured sands, and clay. Final deglaciation was likely rapid as the ice margin calved into the glacial lake. Younger glaciolacustrine sediments found to the east of the study area at and near surface, and into Lake Erie suggest that glacial lakes existed in the area for some time following deglaciation of the study area (Barnett 1982, 1985).

Radiocarbon dating of detrital wood and leaves of *D. integrifolia* found in deltaic glaciolacustrine deposits overlying Port Stanley Till returned 2 populations of radiocarbon ages; an older suite of ages ranging between 29.45 and 50.6 ka ^{14}C BP and a younger population ranging between 14.06 and 14.7 ka ^{14}C BP. The younger group of dates are the oldest reported postglacial radiocarbon ages from southwestern Ontario and suggest deglaciation some time prior to this, possibly as early as 15 ka BP.

This report outlines the Quaternary geology portion of the Tier 3 Groundwater Budget and Risk assessment program. A description of the subsurface materials has been summarized and although it provides a broad understanding of the sedimentary deposits in the study area, additional work is warranted. Additional boreholes would be of great benefit to further constrain the vertical and lateral extent of the various deposits. This is especially true in the area between the Tillsonburg and Paris moraines. Although beyond the scope of this study, subsurface computer modelling using the available water well records in addition to the boreholes drilled for this study would once again further the understanding of the spatial extent of the various sediment packages, and in turn, provide additional information regarding the role these sediments play in the hydrogeological system.

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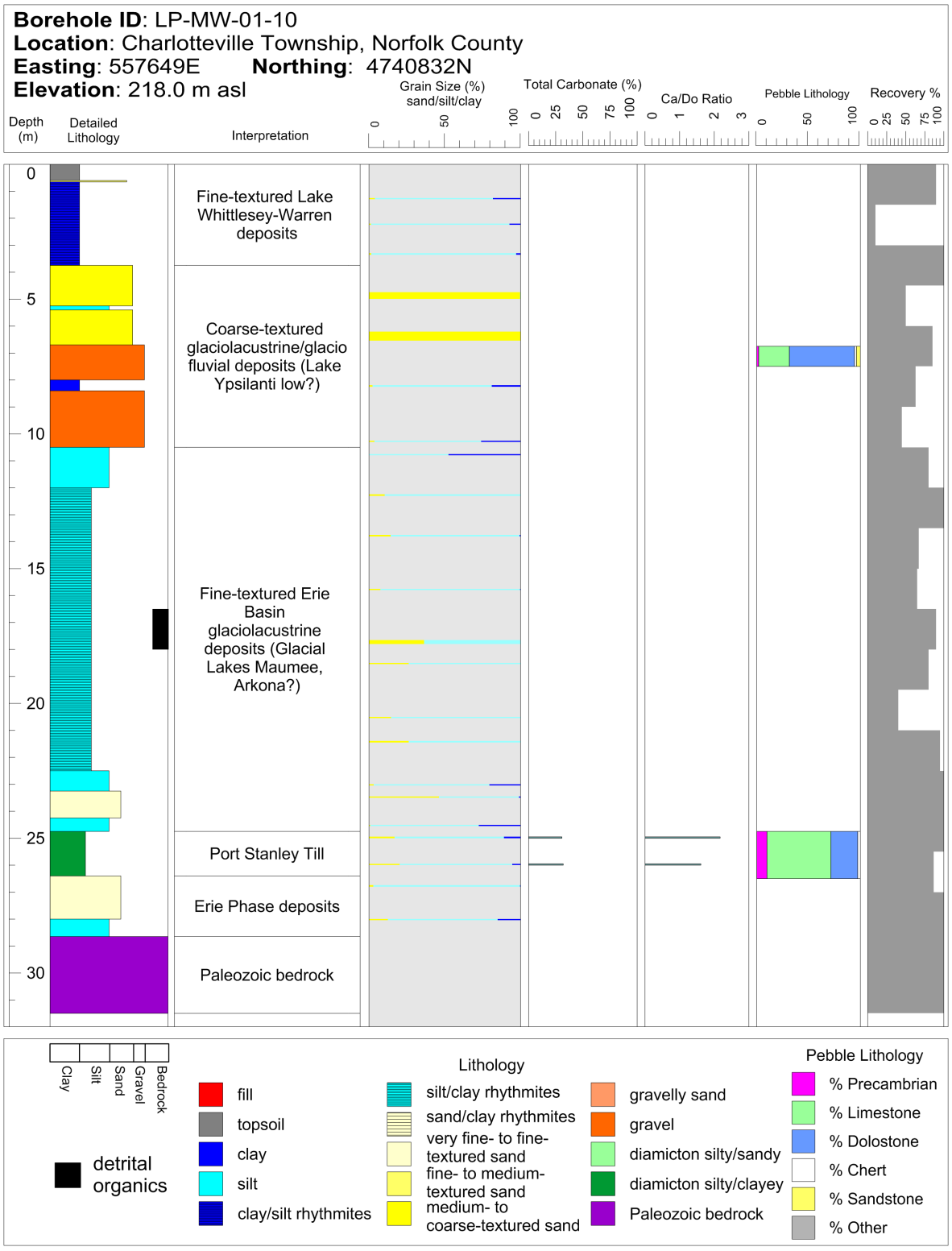
Appendix 1

Graphic Borehole Logs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Elevation: 218.0 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Fine-textured Lake Whittlesey-Warren deposits
Coarse-textured glaciolacustrine/glacio fluvial deposits (Lake Ypsilanti low?)
Fine-textured Erie Basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Port Stanley Till
Erie Phase deposits
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

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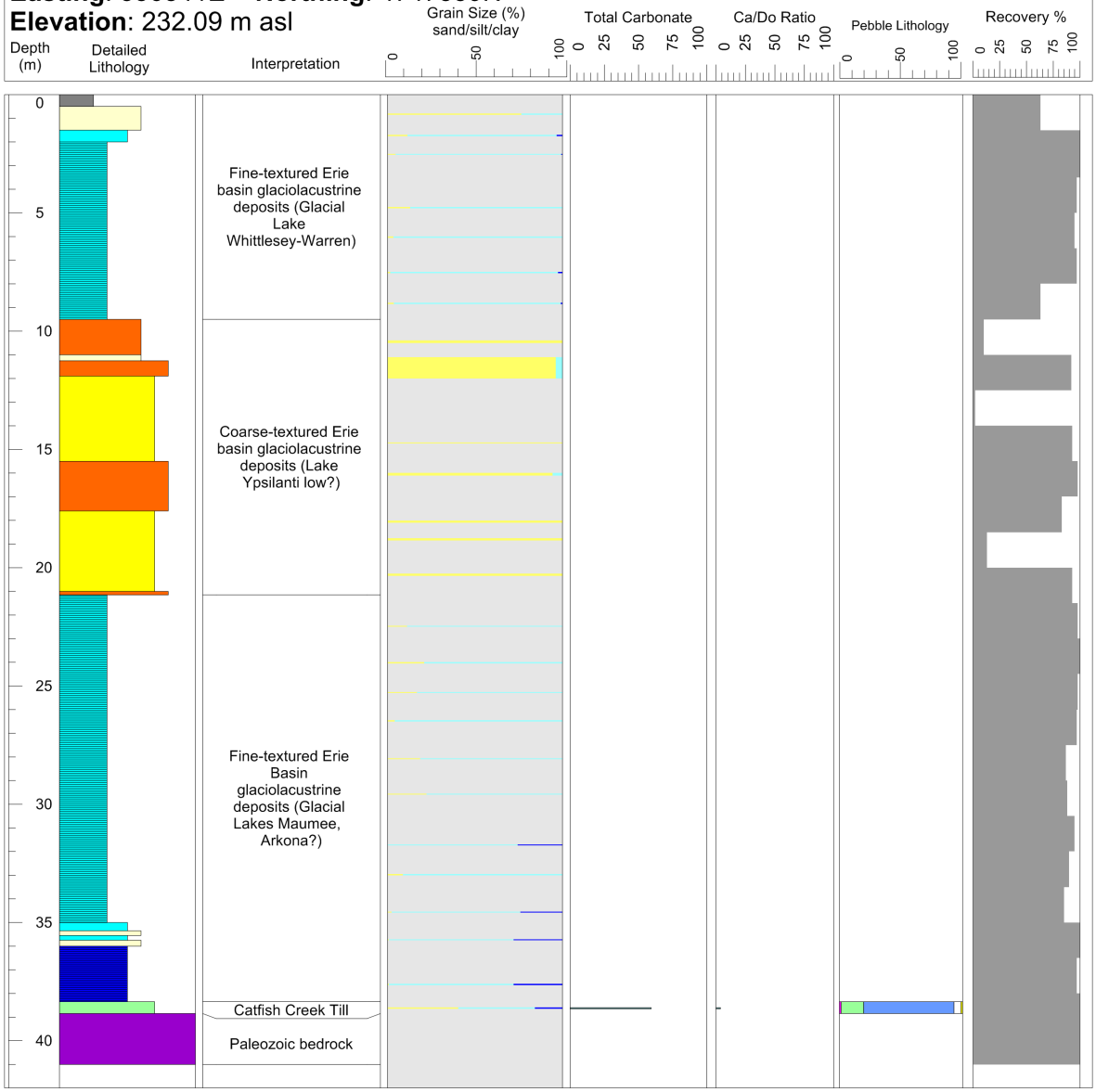
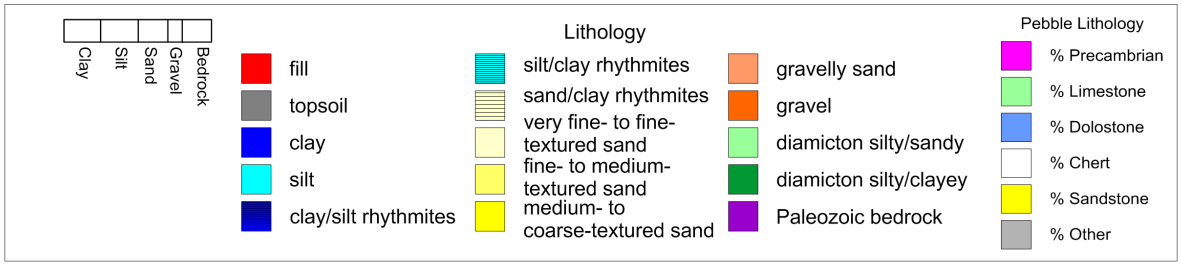
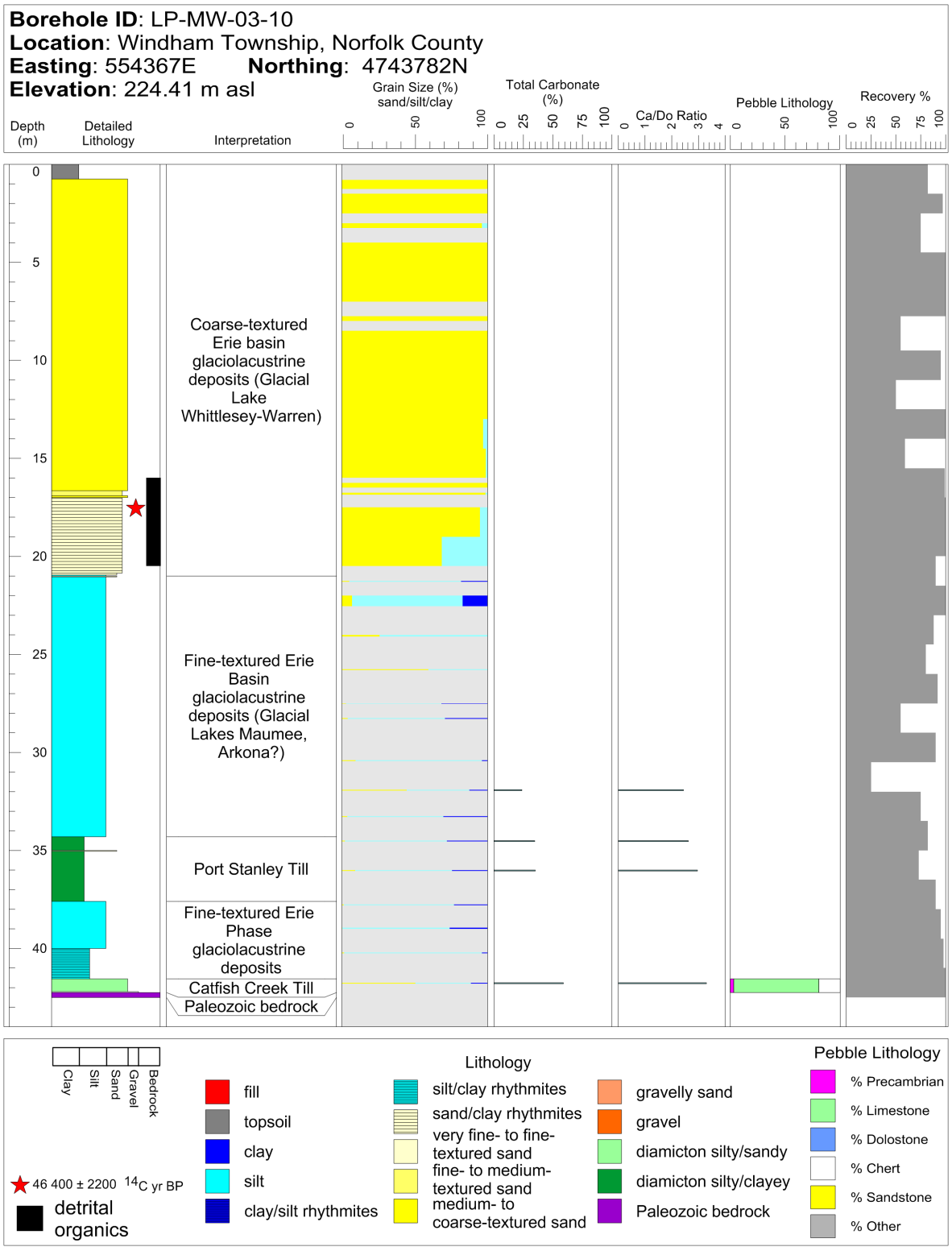
Elevation: 232.09 m asl



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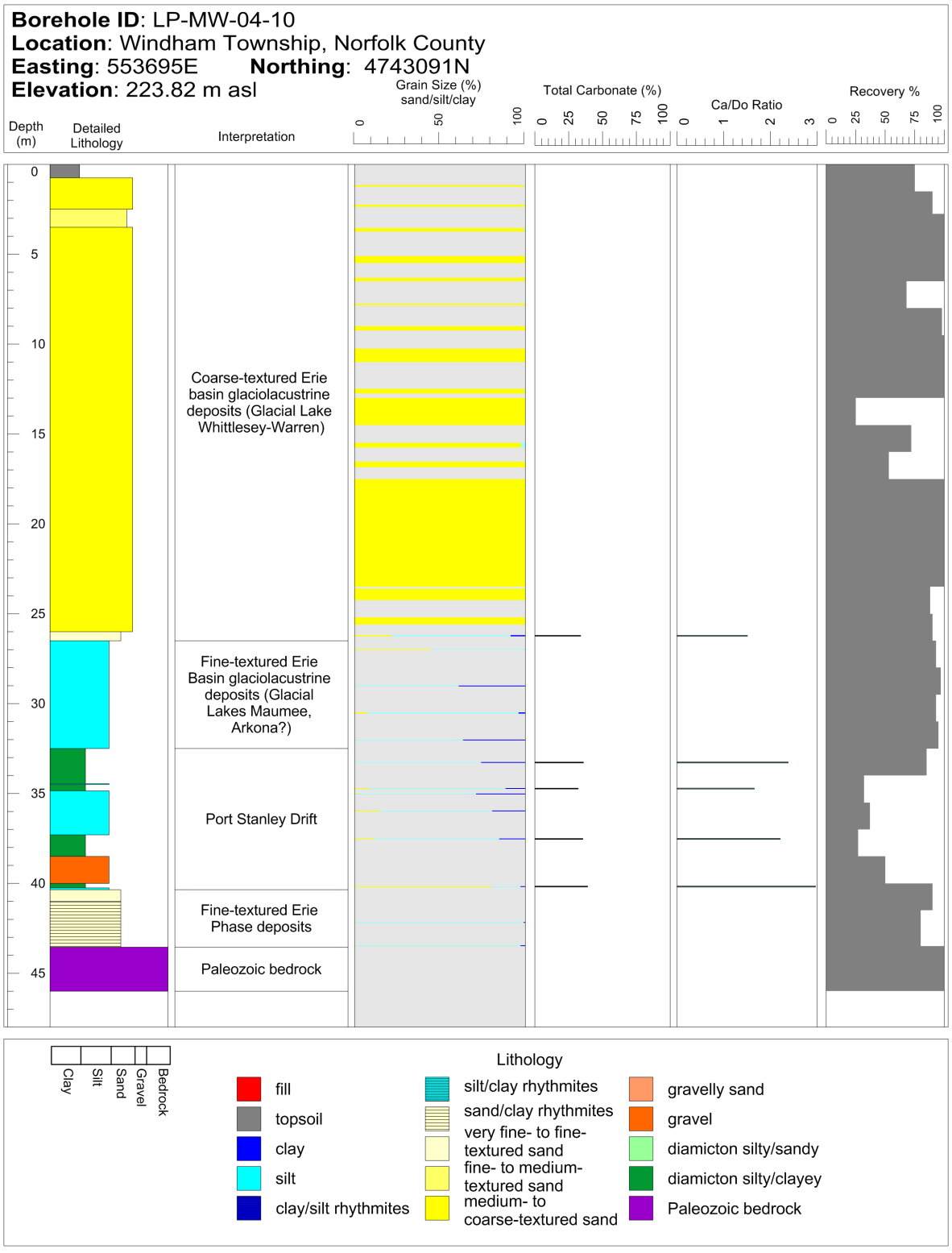
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie Basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Port Stanley Till
Fine-textured Erie Phase glaciolacustrine deposits
Catfish Creek Till
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
46 400 ± 2200 14C yr BP
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other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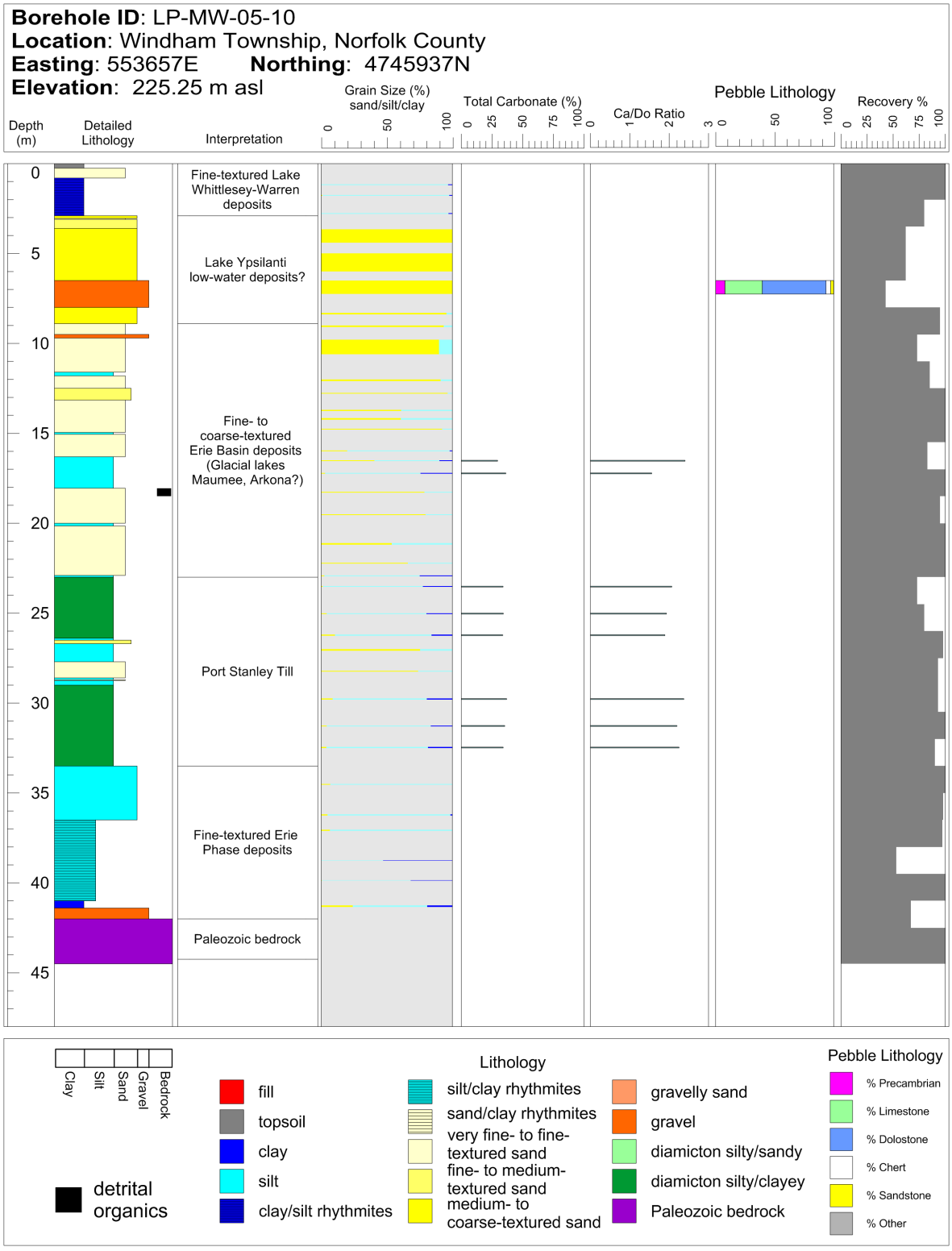
Elevation: 223.82 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie Basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Port Stanley Drift
Fine-textured Erie Phase deposits
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock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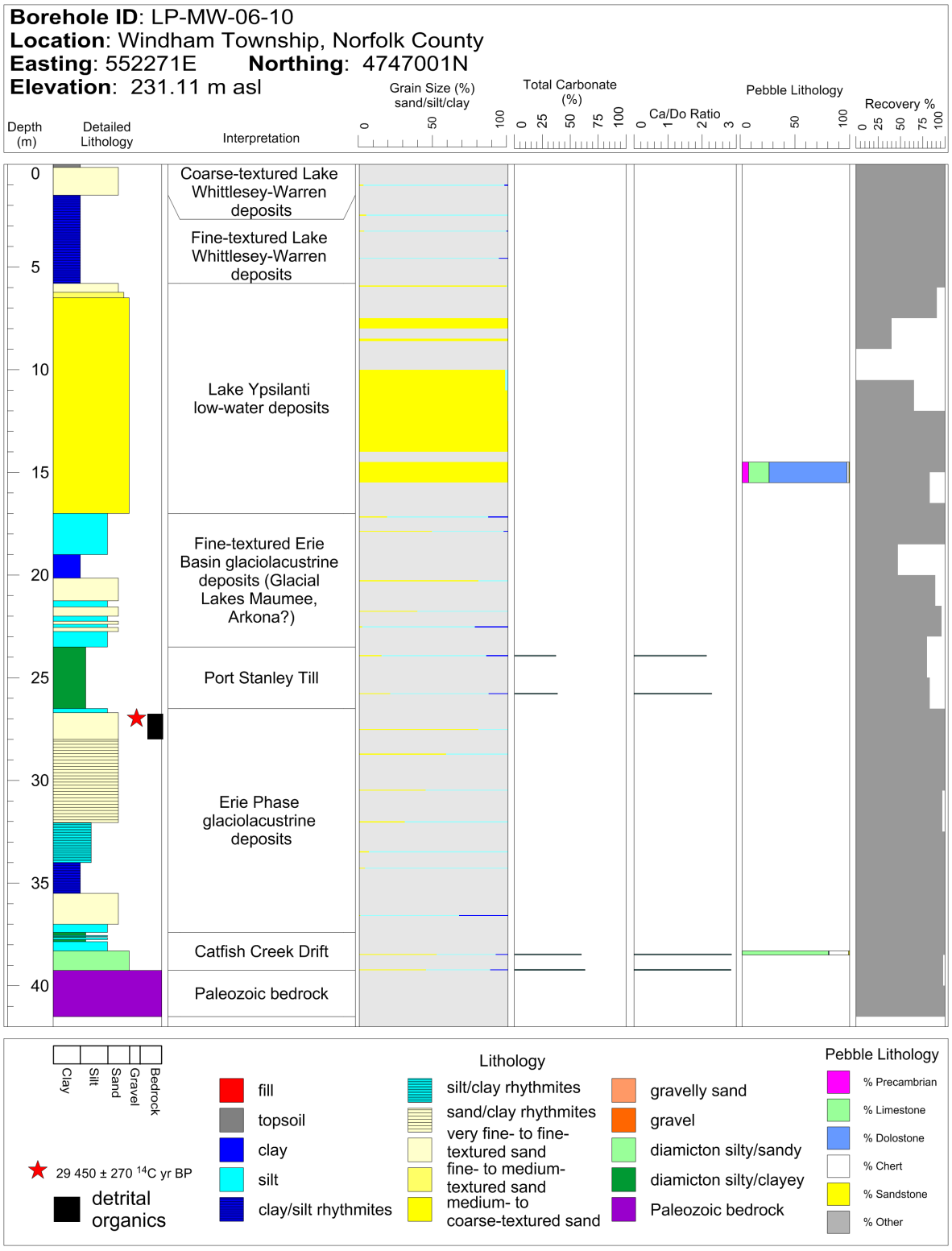
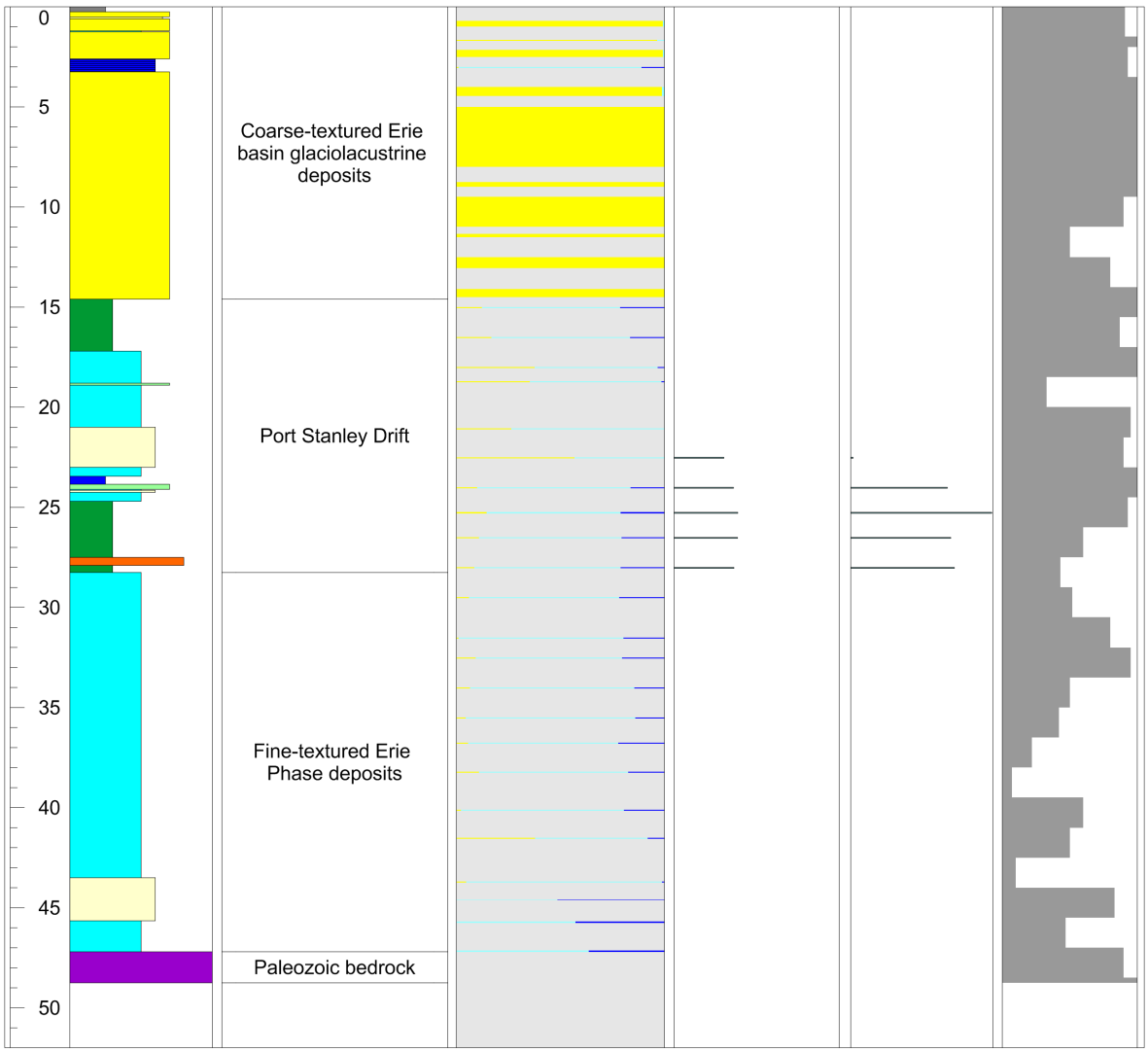
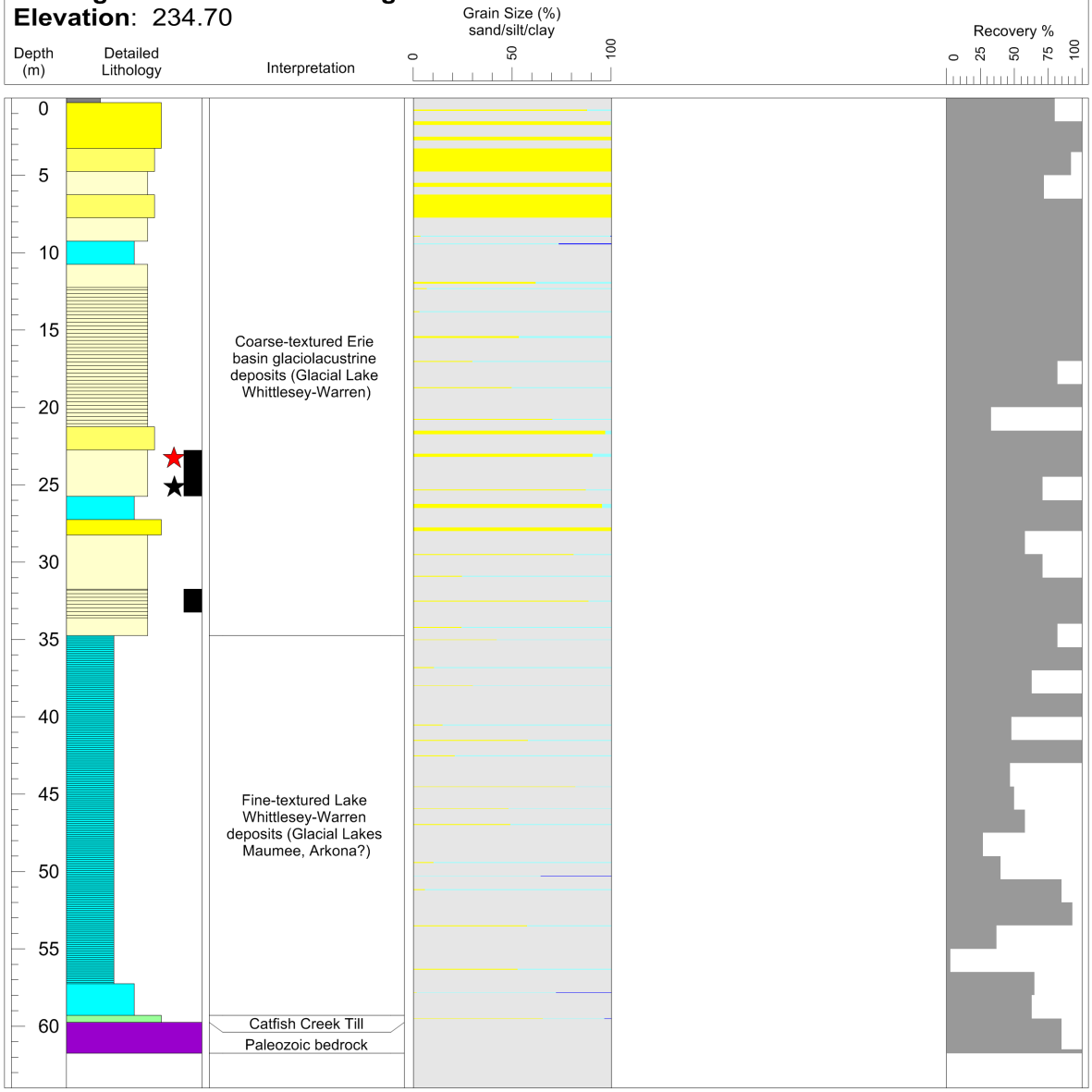
Elevation: 225.25 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Fine-textured Lake Whittlesey-Warren deposits
Lake Ypsilanti low-water deposits?
Fine- to coarse-textured Erie Basin deposits (Glacial lakes Maumee, Arkona?)
Port Stanley Till
Fine-textured Erie Phase deposits
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

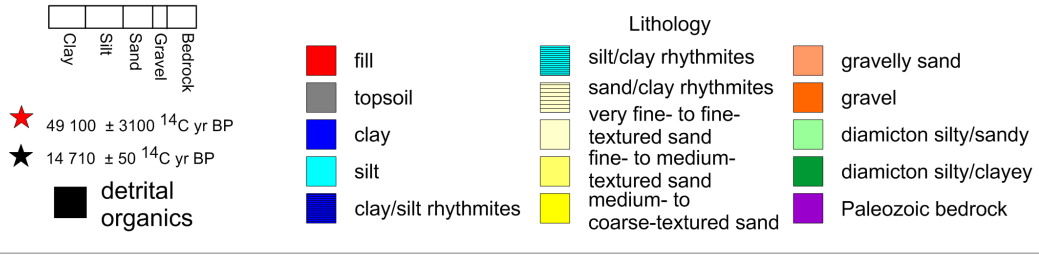

Borehole ID: LP-MW-06-10
Location: Windham Township, Norfolk County
Easting: 552271E Northing: 4747001N
Elevation: 231.11 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Lake Whittlesey-Warren deposits
Fine-textured Lake Whittlesey-Warren deposits
Lake Ypsilanti low-water deposits
Fine-textured Erie Basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Port Stanley Till
Erie Phase glaciolacustrine deposits
Catfish Creek Drift
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
29 450 ± 270 14C yr BP
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

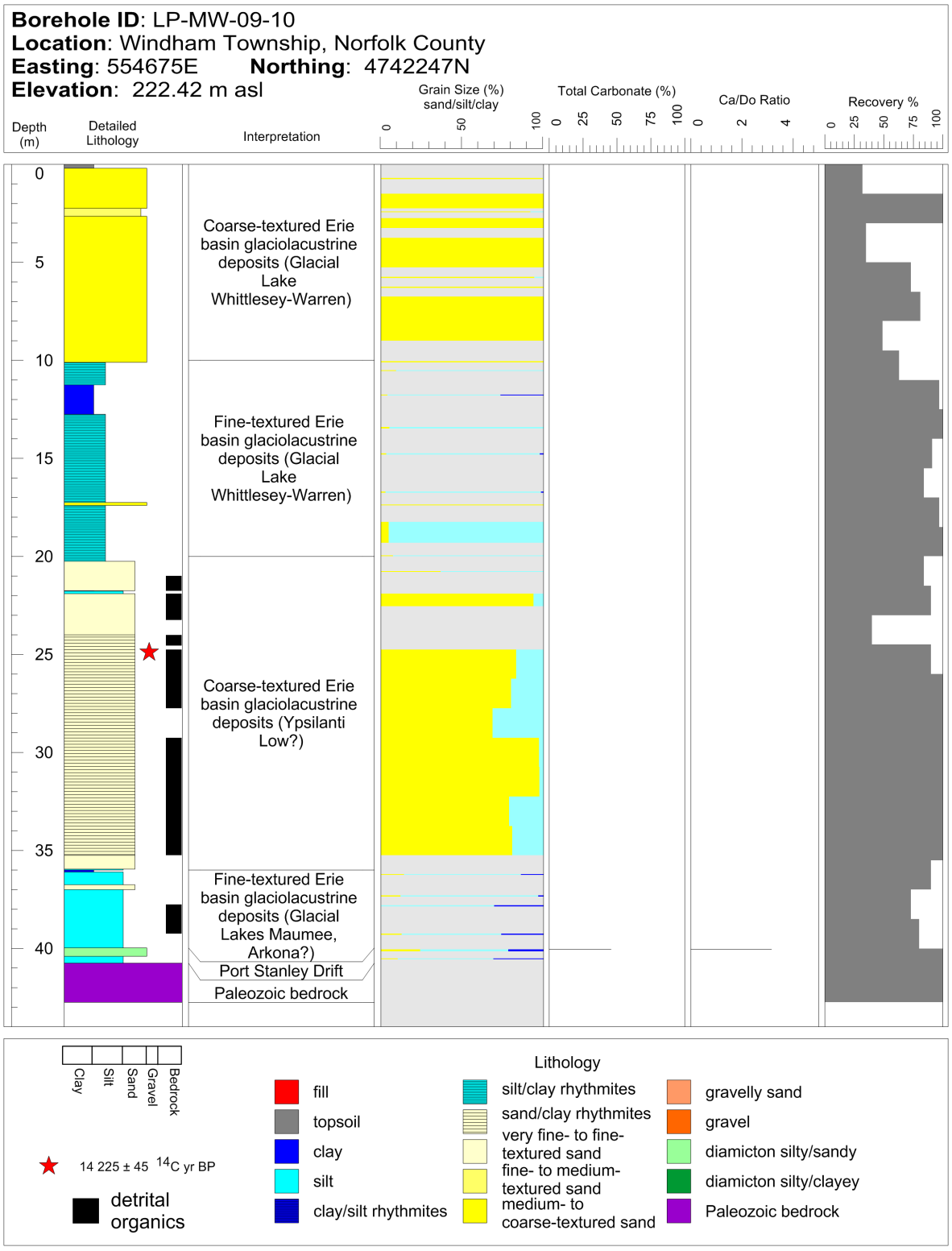
Borehole ID: LP-MW-07-10
Location: Woodhouse Township, Norfolk County
Easting: 552484E **Northing**: 4744349N
Elevation: 228.54 m asl



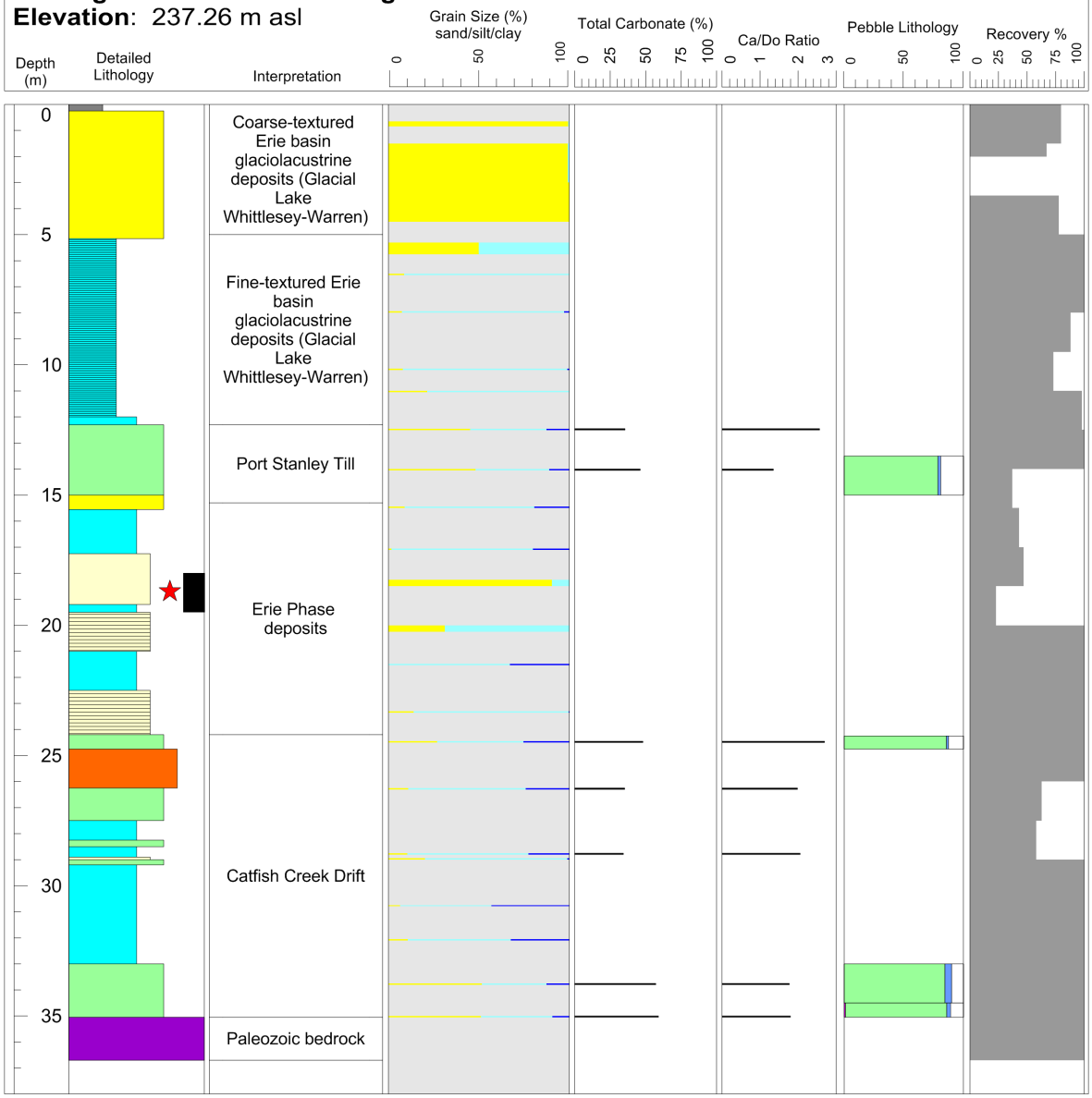
Borehole ID: LP-MW-08-10
Location: Charlotteville Township, Norfolk County
Easting: 549453E **Northing**: 4742765N
Elevation: 234.70

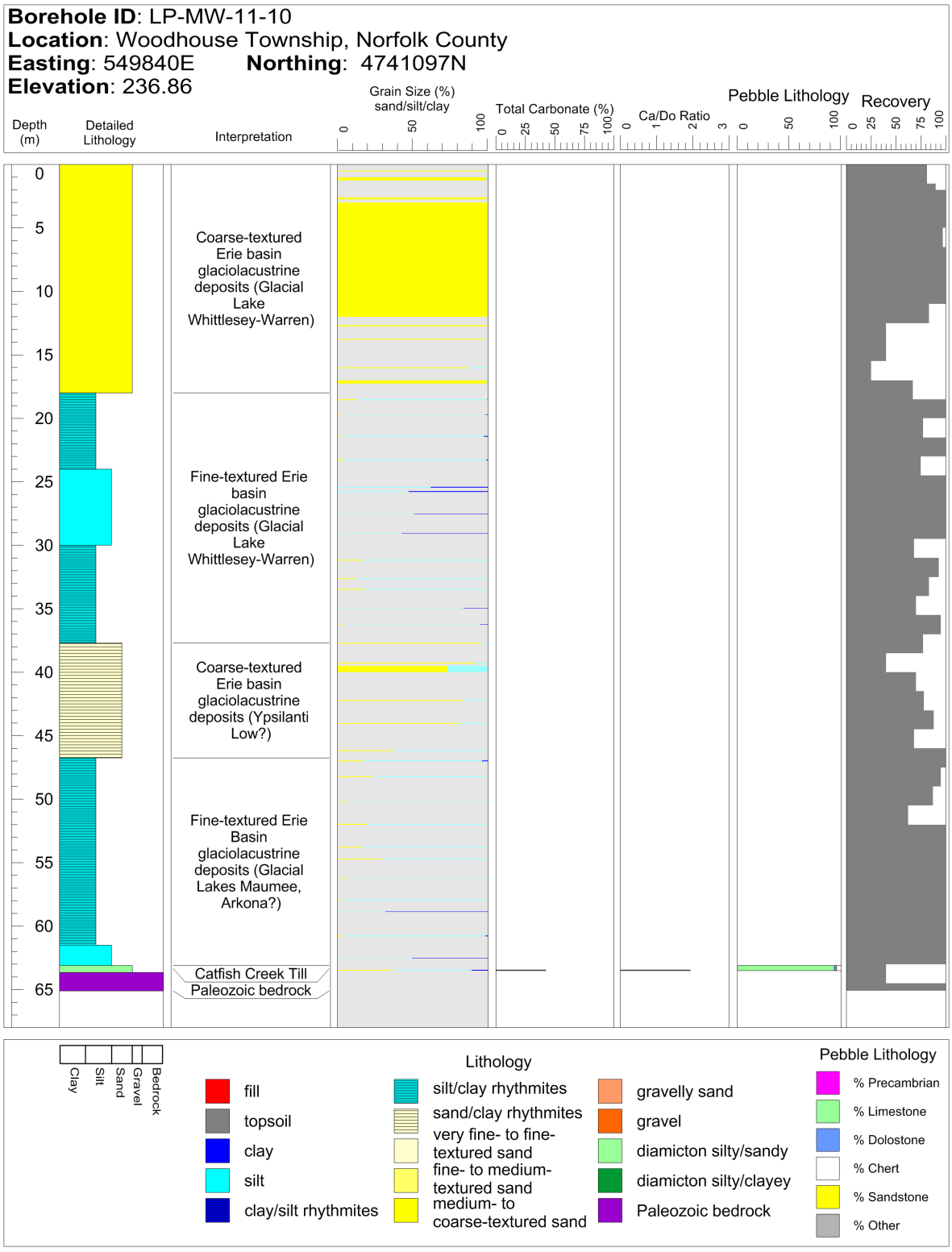


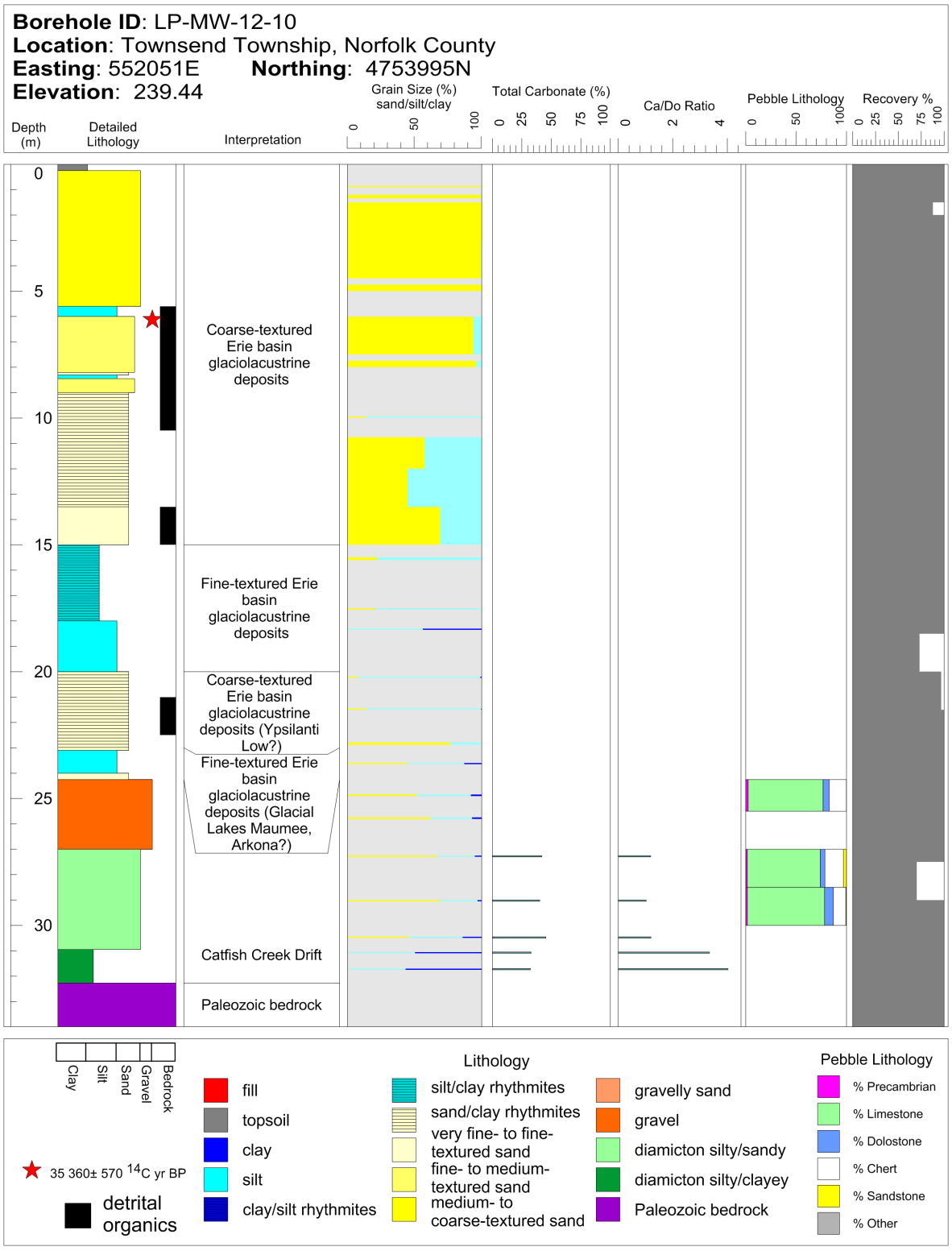


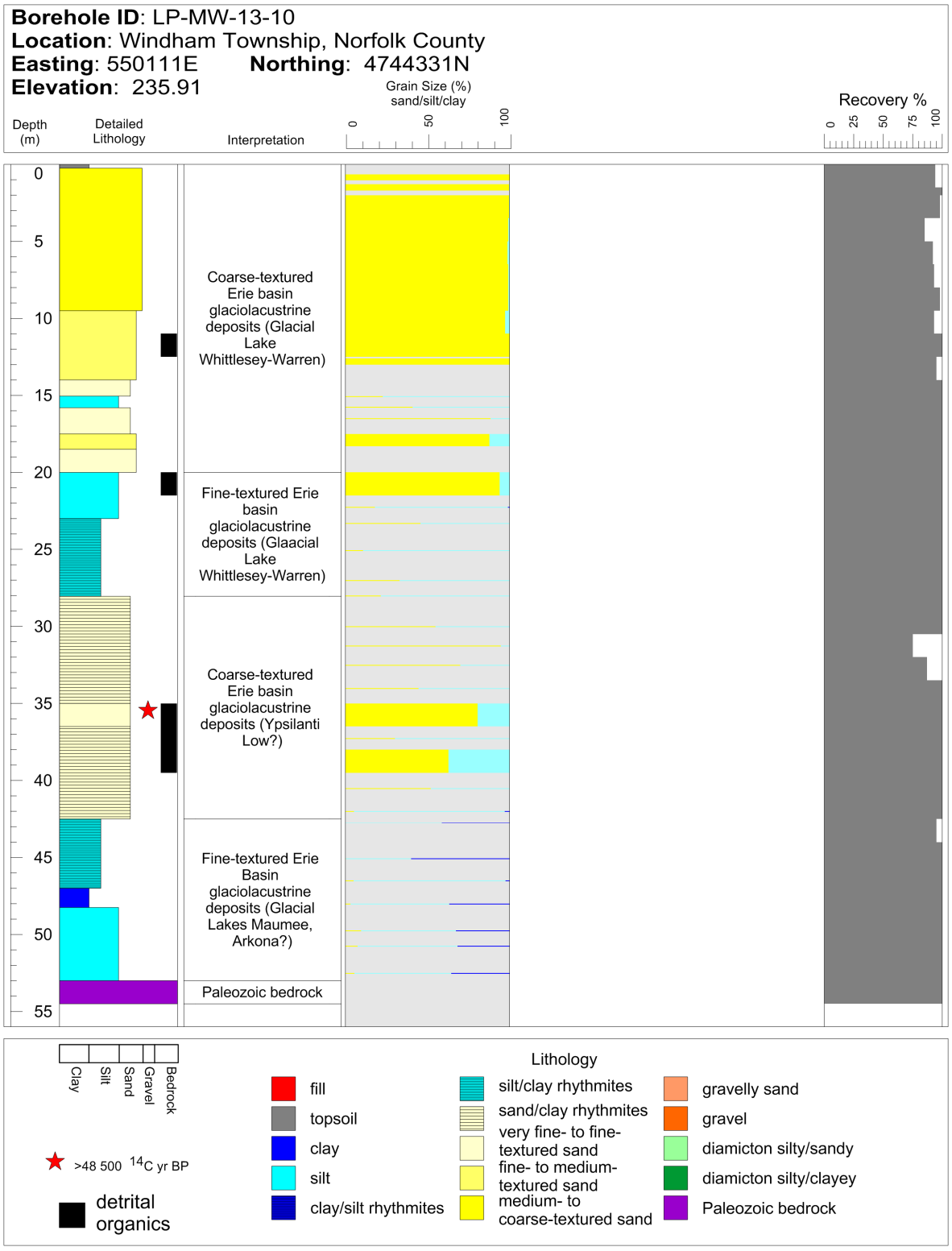

Borehole ID: LP-MW-09-10
Location: Windham Township, Norfolk County
Easting: 554675E Northing: 4742247N
Elevation: 222.42 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Coarse-textured Erie basin glaciolacustrine deposits (Ypsilanti Low?)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Port Stanley Drift
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
14 225 ± 45 14C yr BP
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock

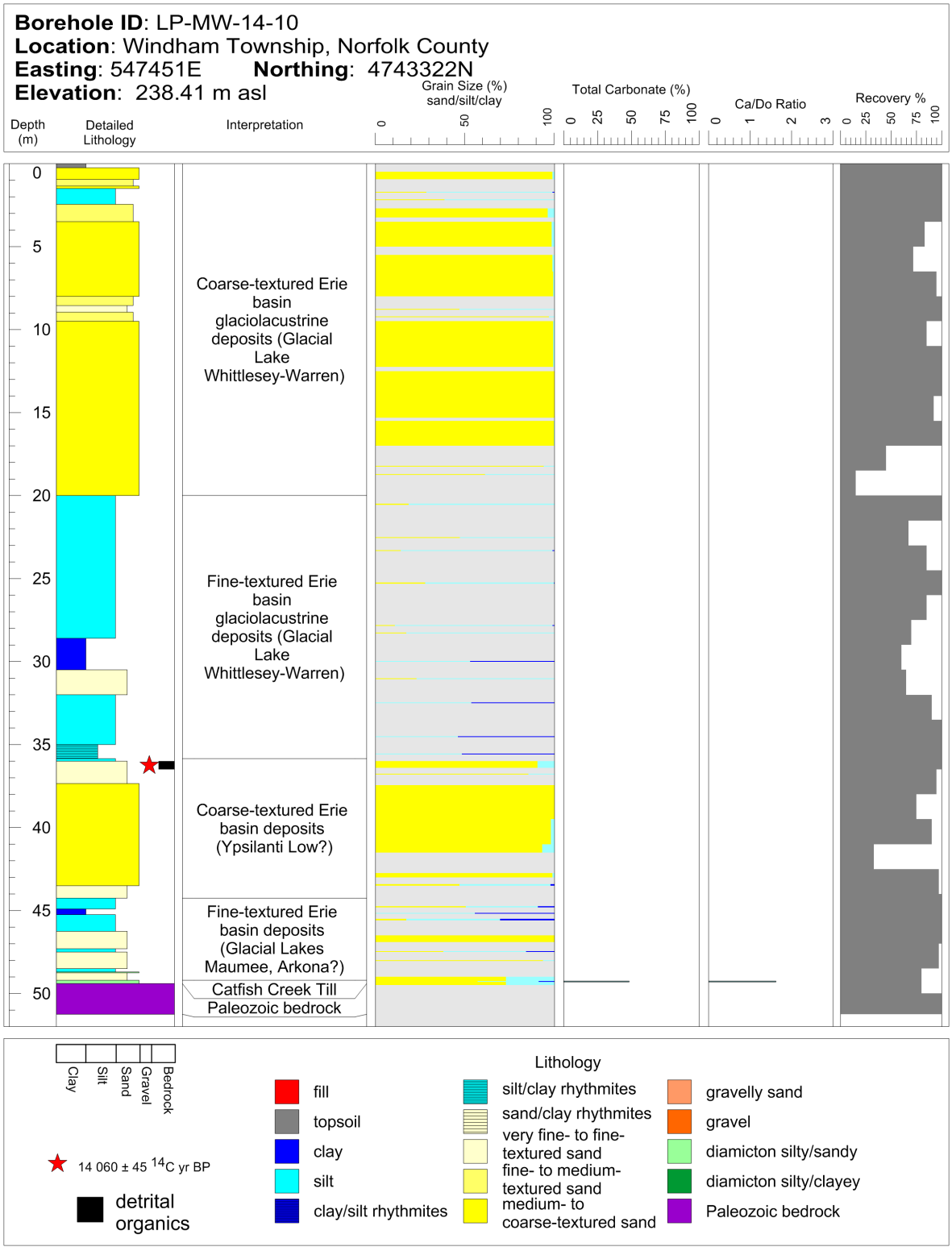
Borehole ID: LP-MW-10-10
Location: Windham Township, Norfolk County
Easting: 549878E **Northing**: 4750746N
Elevation: 237.26 m asl

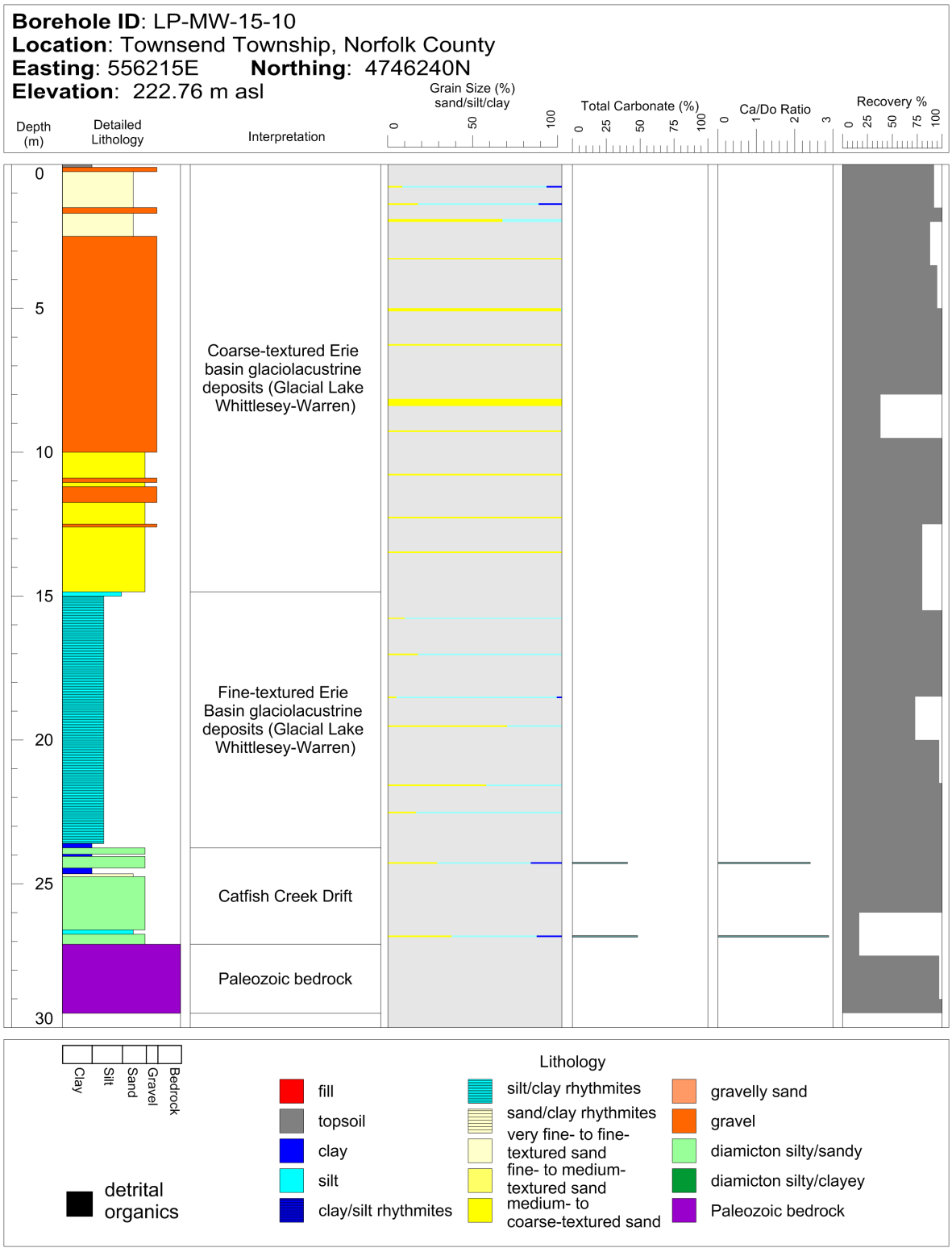


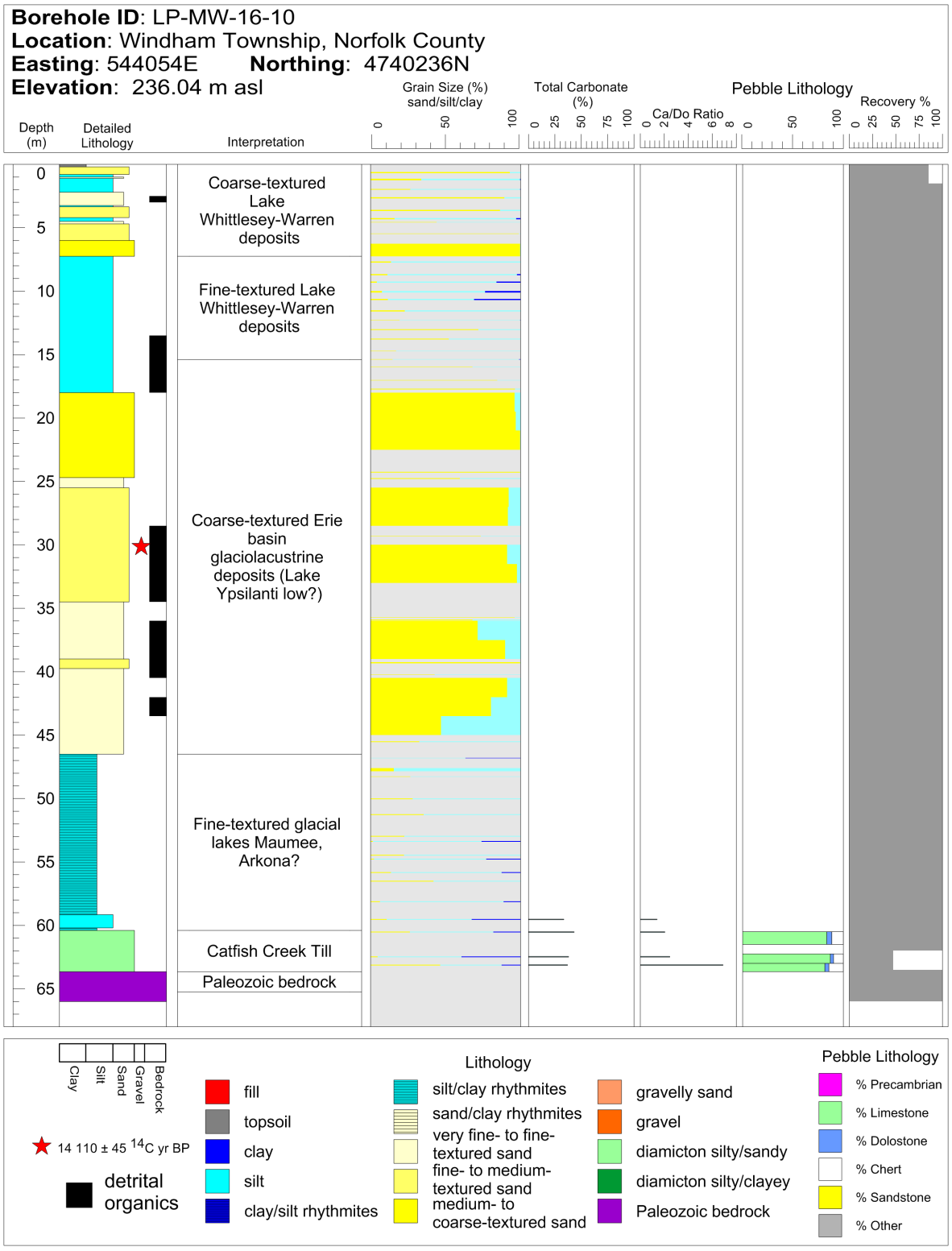

Borehole ID: LP-MW-11-10
Location: Woodhouse Township, Norfolk County
Easting: 549840E Northing: 4741097N
Elevation: 236.86
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Coarse-textured Erie basin glaciolacustrine deposits (Ypsilanti Low?)
Fine-textured Erie Basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Catfish Creek Till
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

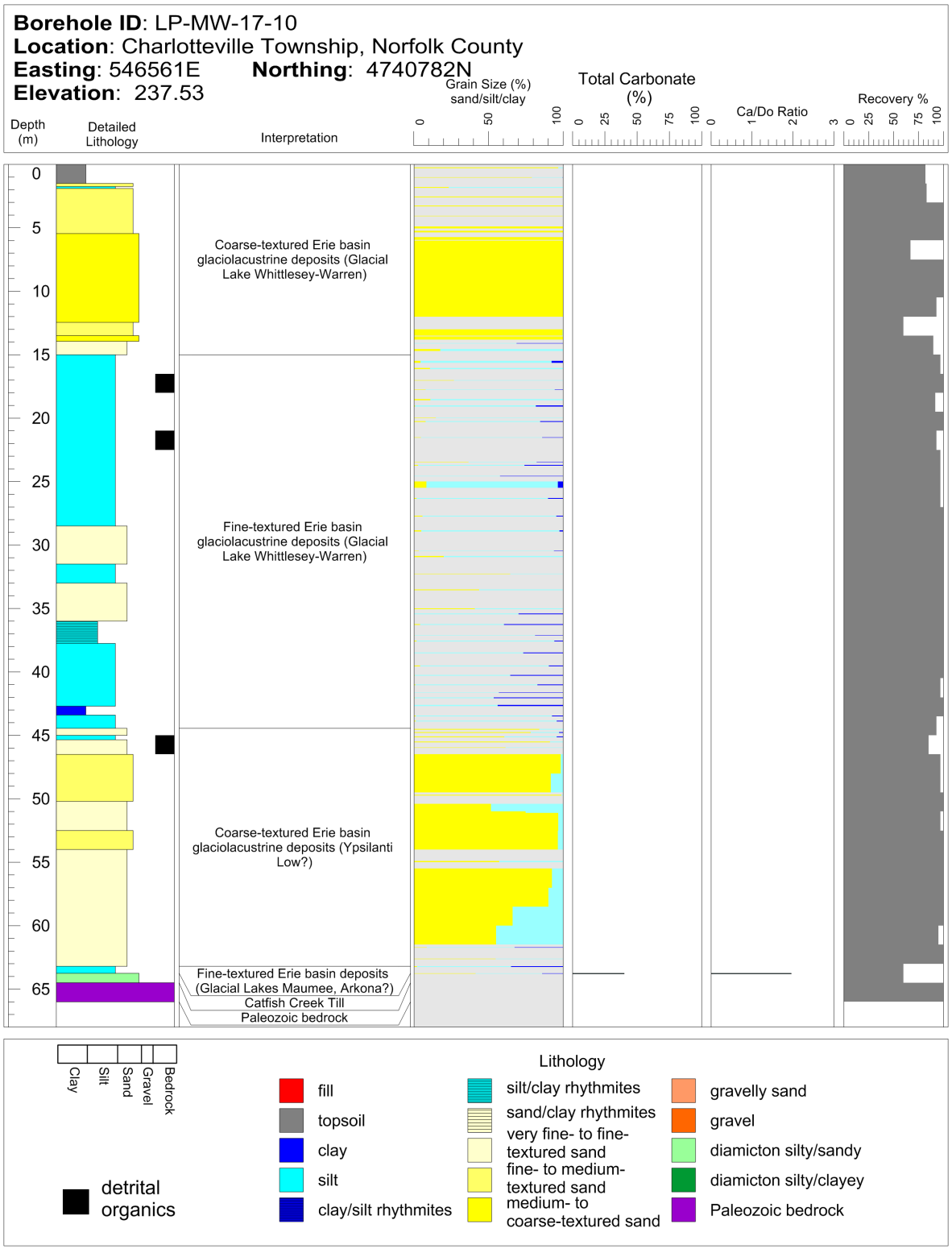

Borehole ID: LP-MW-12-10
Location: Townsend Township, Norfolk County
Easting: 552051E
Northing: 4753995N
Elevation: 239.44
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits
Fine-textured Erie basin glaciolacustrine deposits
Coarse-textured Erie basin glaciolacustrine deposits (Ypsilanti Low?)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Catfish Creek Drift
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
35 360± 570 14C yr BP
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

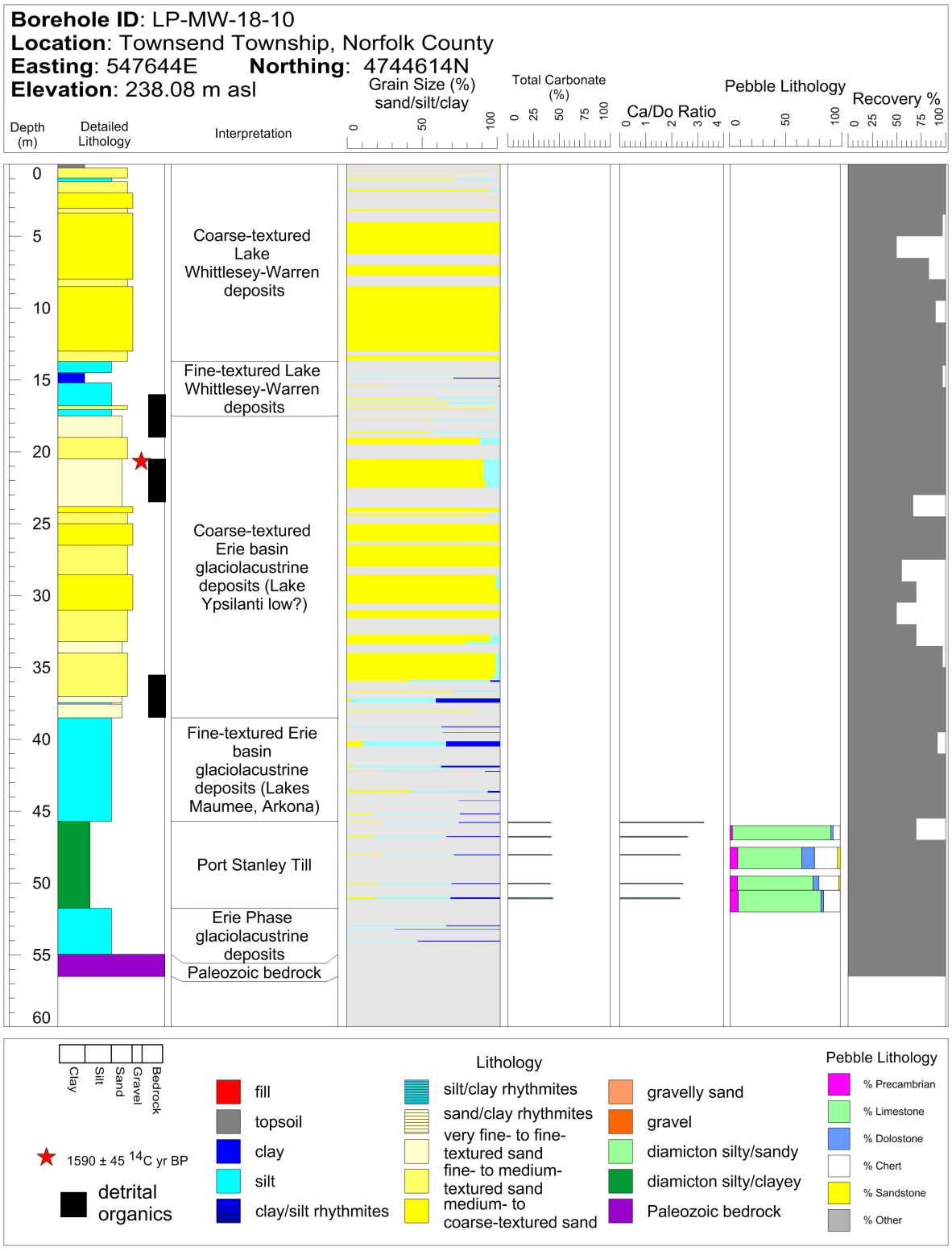

Borehole ID: LP-MW-13-10
Location: Windham Township, Norfolk County
Easting: 550111E
Northing: 4744331N
Elevation: 235.91
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glaacial Lake Whittlesey-Warren)
Coarse-textured Erie basin glaciolacustrine deposits (Ypsilanti Low?)
Fine-textured Erie Basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
>48 500 14C yr BP
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock

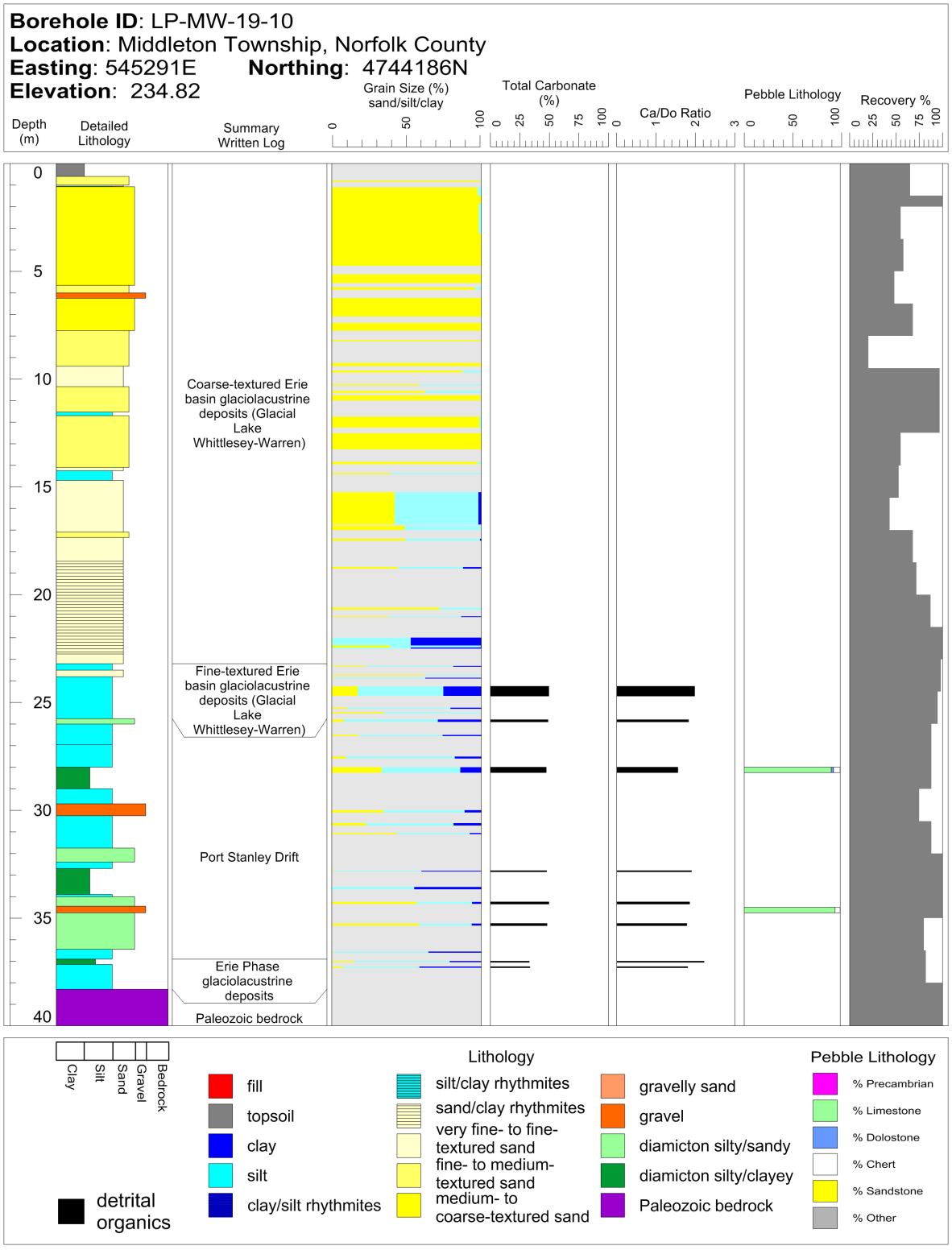

Borehole ID: LP-MW-14-10
Location: Windham Township, Norfolk County
Easting: 547451E Northing: 4743322N
Elevation: 238.41 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Recovery %
0
5
10
15
20
25
30
35
40
45
50
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Coarse-textured Erie basin deposits (Ypsilanti Low?)
Fine-textured Erie basin deposits (Glacial Lakes Maumee, Arkona?)
Catfish Creek Till
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
14 060 ± 45 14C yr BP
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock

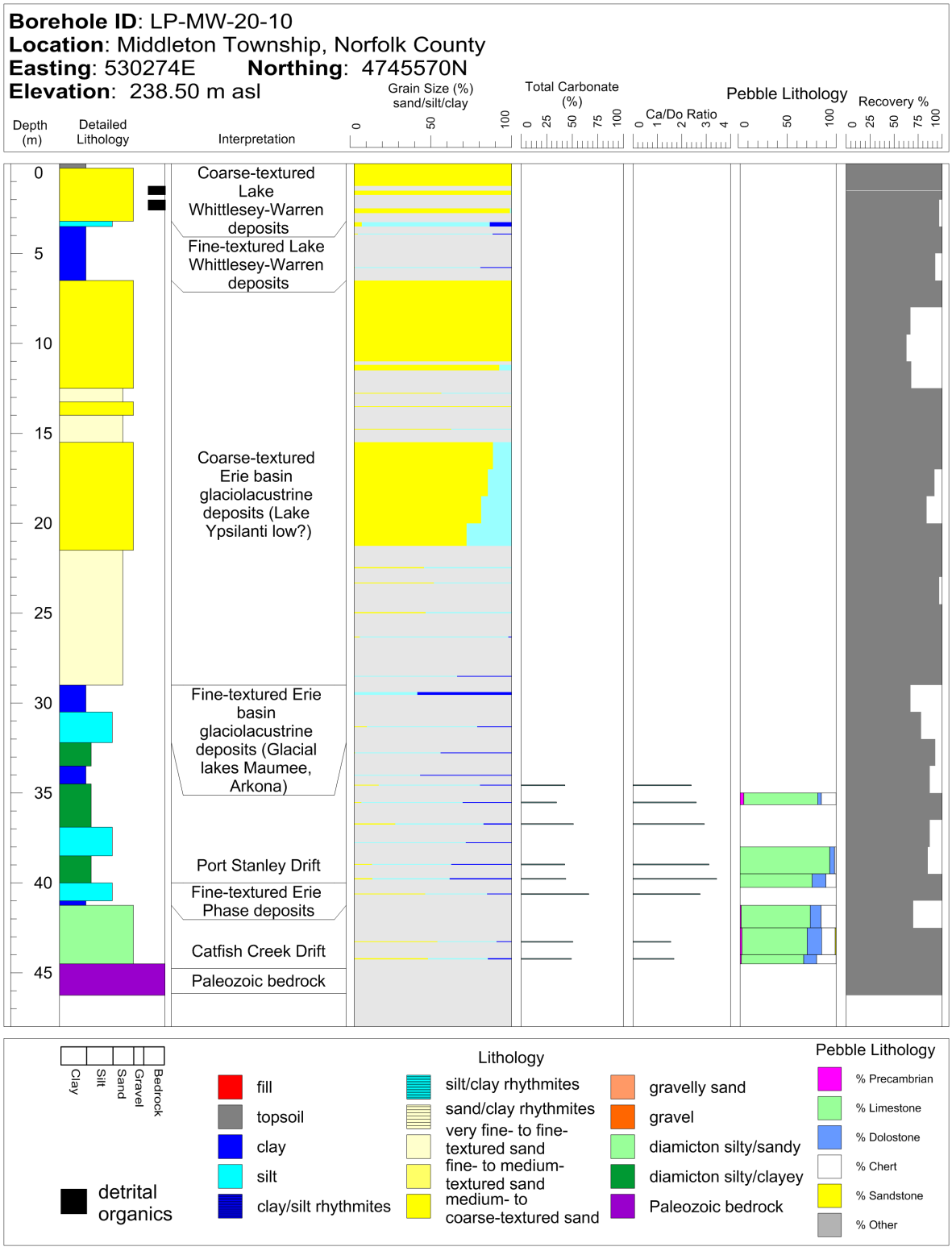

Borehole ID: LP-MW-15-10
Location: Townsend Township, Norfolk County
Easting: 556215E Northing: 4746240N
Elevation: 222.76 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Recovery %
0
5
10
15
20
25
30
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie Basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Catfish Creek Drift
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock

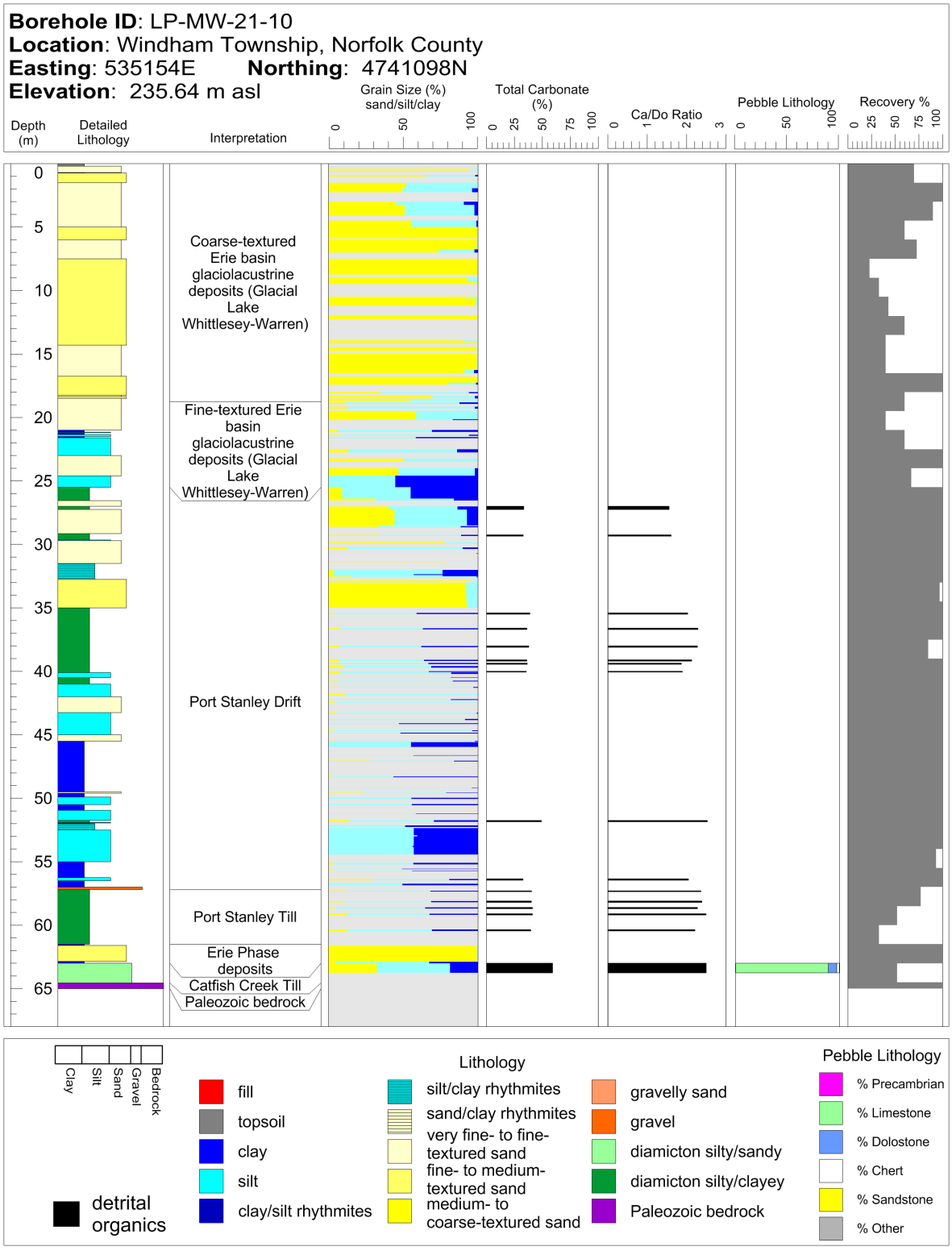

Borehole ID: LP-MW-16-10
Location: Windham Township, Norfolk County
Easting: 544054E Northing: 4740236N
Elevation: 236.04 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Lake Whittlesey-Warren deposits
Fine-textured Lake Whittlesey-Warren deposits
Coarse-textured Erie basin glaciolacustrine deposits (Lake Ypsilanti low?)
Fine-textured glacial lakes Maumee, Arkona?
Catfish Creek Till
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
14 110 ± 45 14C yr BP
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

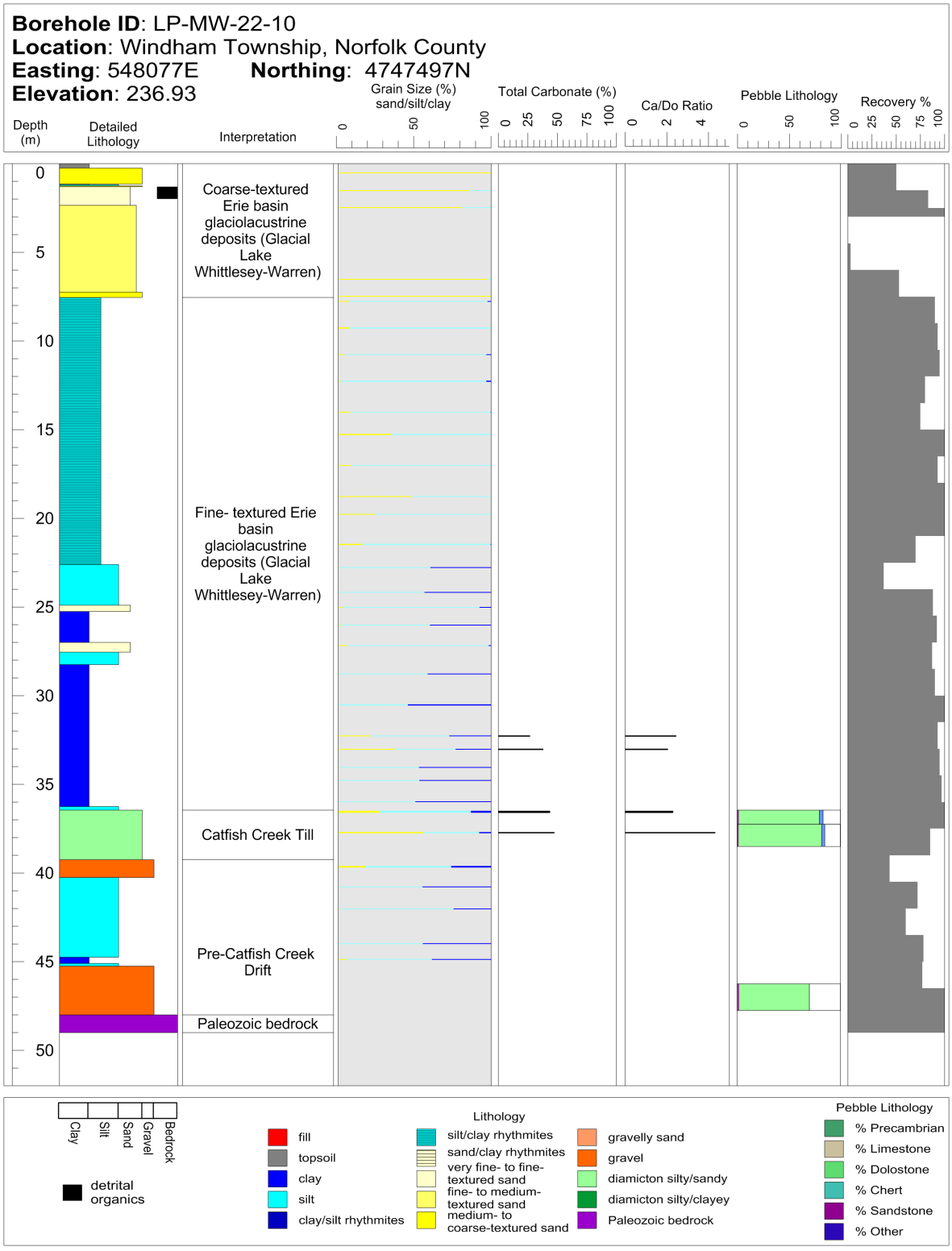

Borehole ID: LP-MW-17-10
Location: Charlotteville Township, Norfolk County
Easting: 546561E
Northing: 4740782N
Elevation: 237.53
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Coarse-textured Erie basin glaciolacustrine deposits (Ypsilanti Low?)
Fine-textured Erie basin deposits (Glacial Lakes Maumee, Arkona?)
Catfish Creek Till
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock

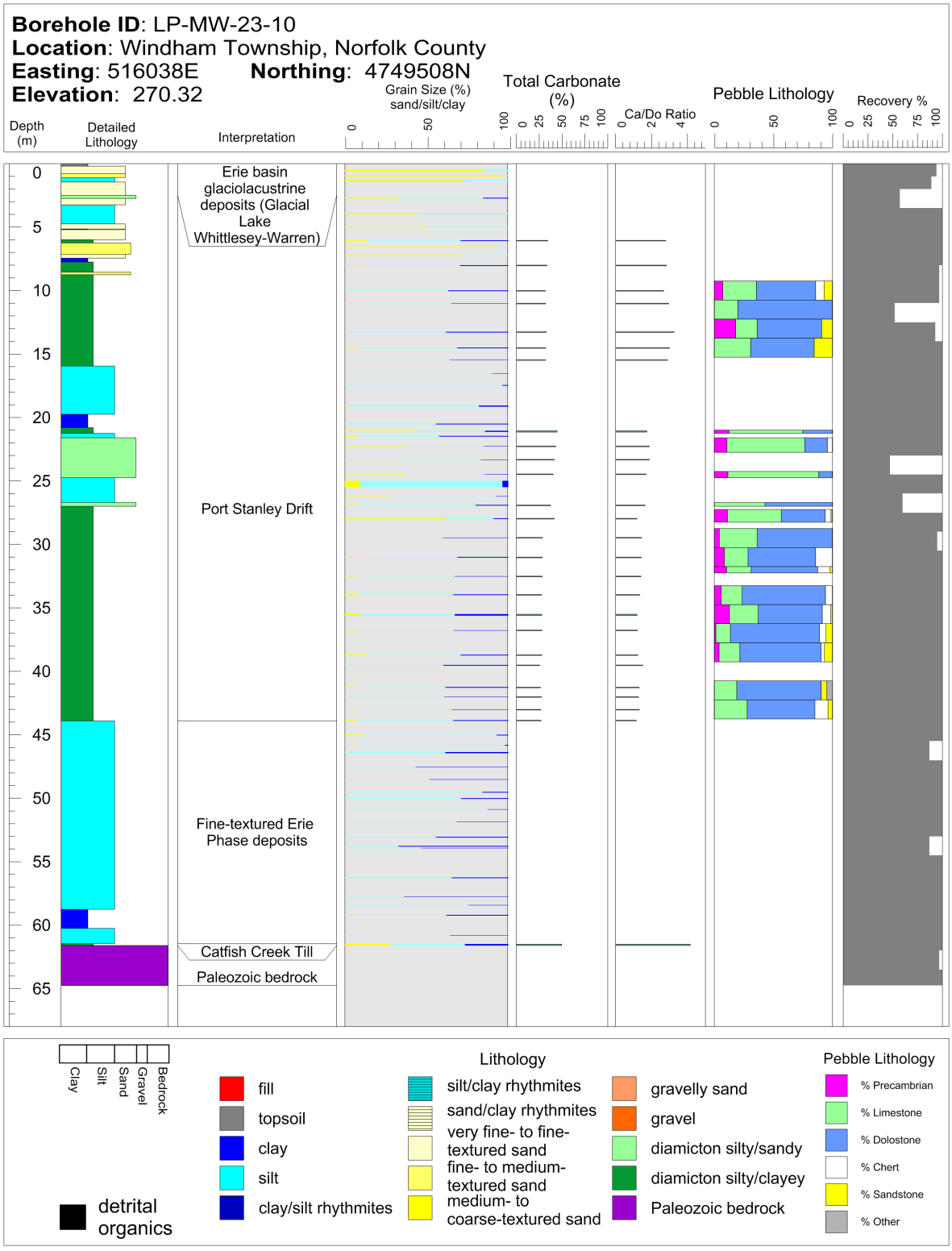

Borehole ID: LP-MW-18-10
Location: Townsend Township, Norfolk County
Easting: 547644E Northing: 4744614N
Elevation: 238.08 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Lake Whittlesey-Warren deposits
Fine-textured Lake Whittlesey-Warren deposits
Coarse-textured Erie basin glaciolacustrine deposits (Lake Ypsilanti low?)
Fine-textured Erie basin glaciolacustrine deposits (Lakes Maumee, Arkona)
Port Stanley Till
Erie Phase glaciolacustrine deposits
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
1590 ± 45 14C yr BP
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

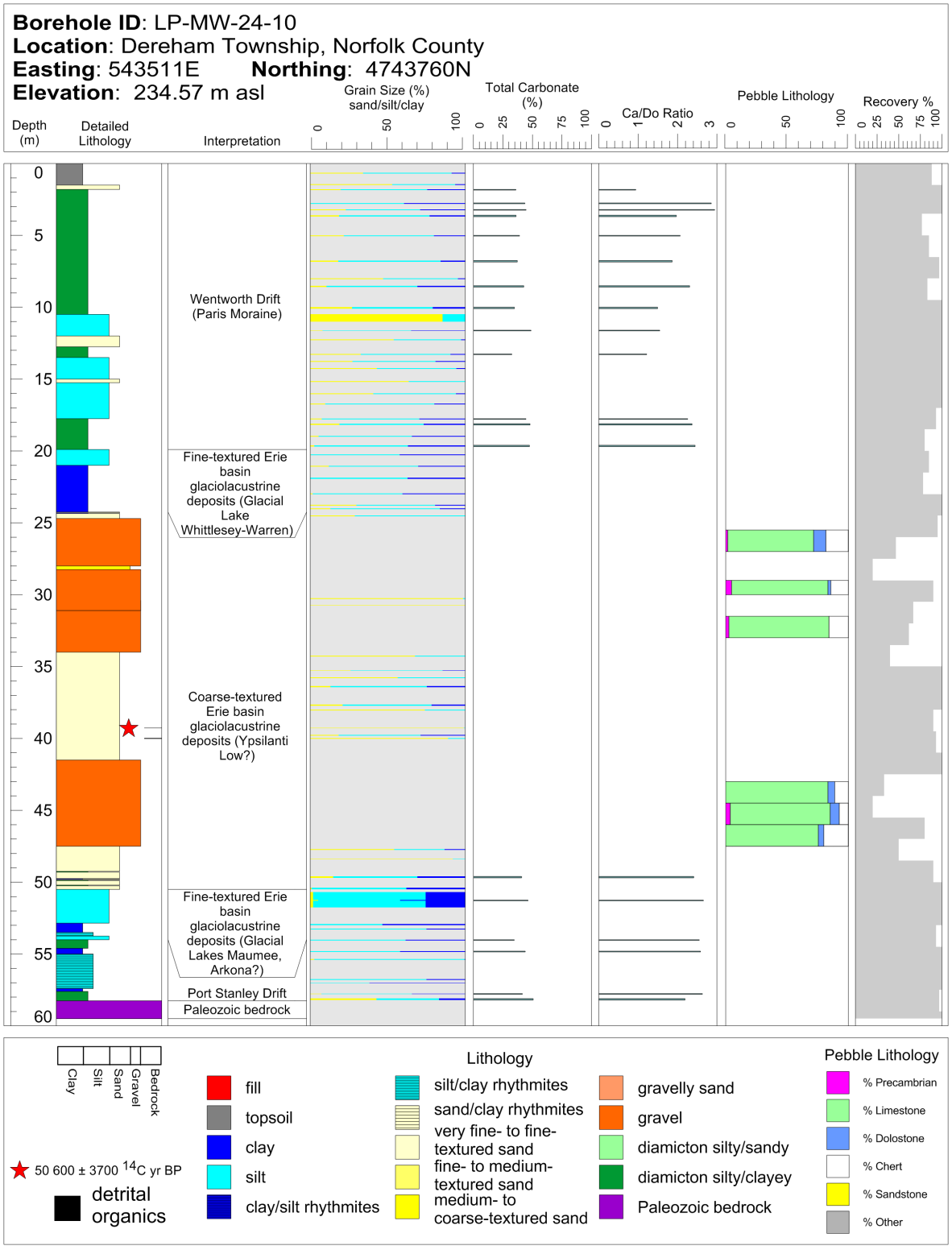

Borehole ID: LP-MW-19-10
Location: Middleton Township, Norfolk County
Easting: 545291E
Northing: 4744186N
Elevation: 234.82
Depth (m)
Detailed Lithology
Summary Written Log
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Port Stanley Drift
Erie Phase glaciolacustrine deposits
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

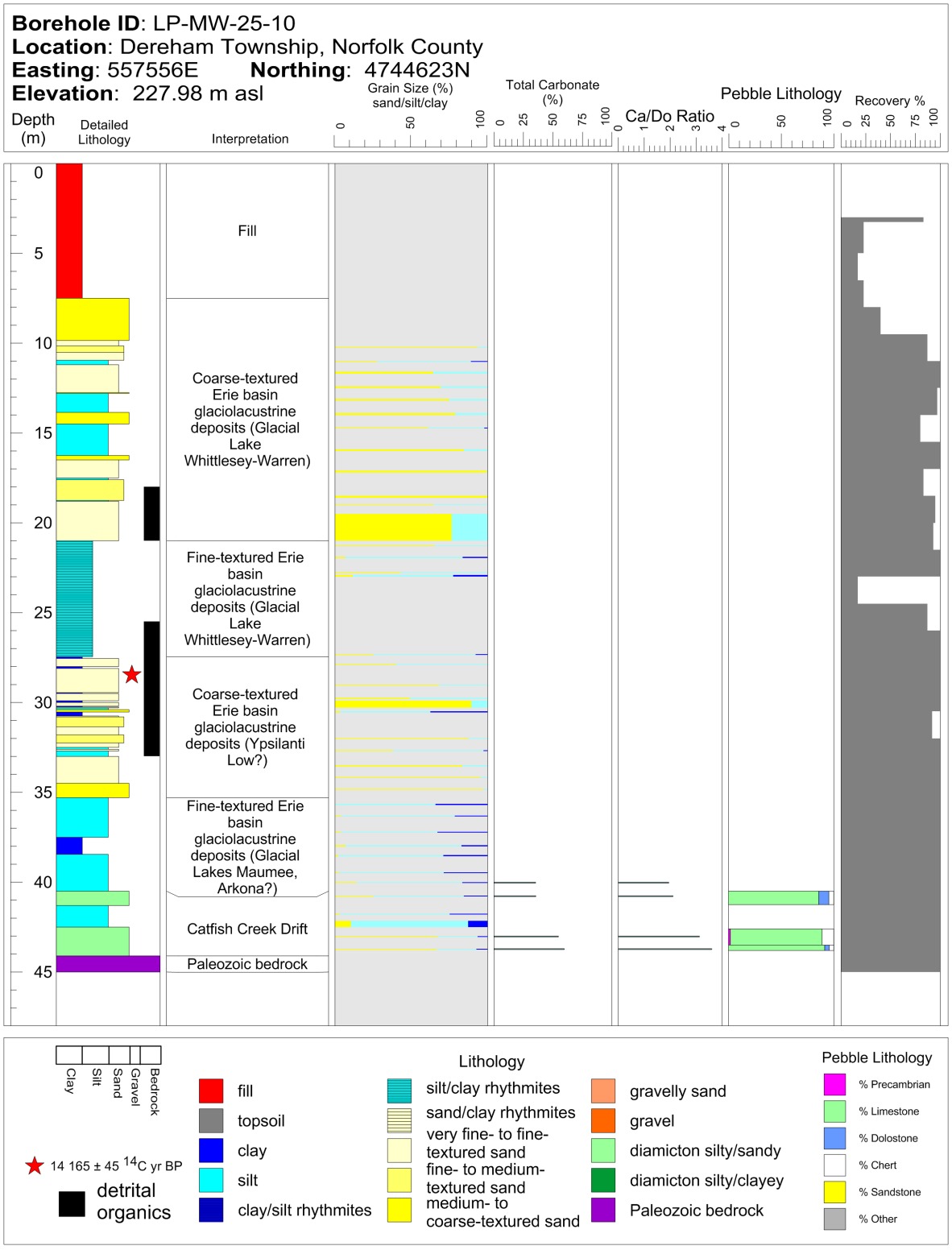

Borehole ID: LP-MW-20-10
Location: Middleton Township, Norfolk County
Easting: 530274E Northing: 4745570N
Elevation: 238.50 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Lake Whittlesey-Warren deposits
Fine-textured Lake Whittlesey-Warren deposits
Coarse-textured Erie basin glaciolacustrine deposits (Lake Ypsilanti low?)
Fine-textured Erie basin glaciolacustrine deposits (Glacial lakes Maumee, Arkona)
Port Stanley Drift
Fine-textured Erie Phase deposits
Catfish Creek Drift
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

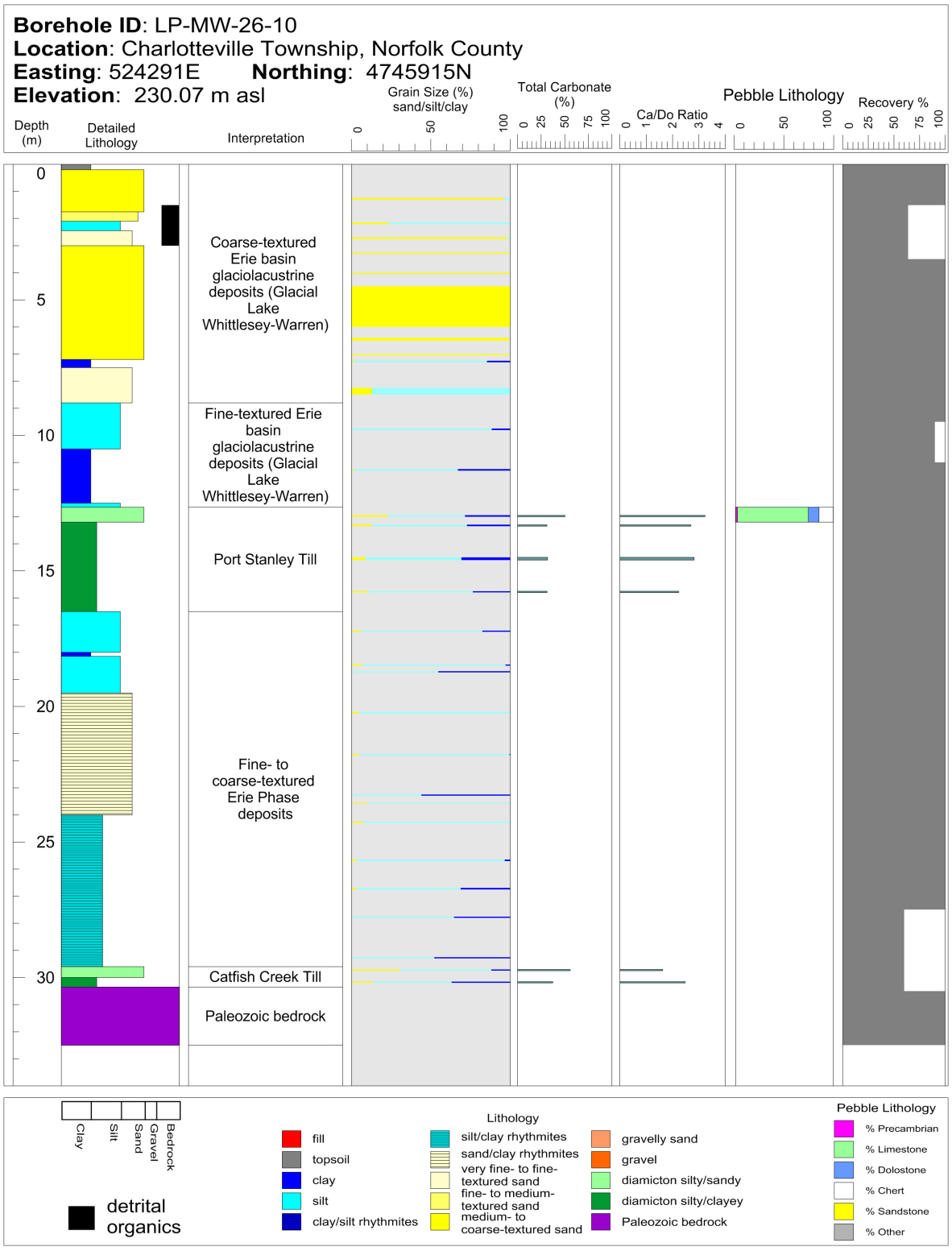

Borehole ID: LP-MW-21-10
Location: Windham Township, Norfolk County
Easting: 535154E Northing: 4741098N
Elevation: 235.64 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Port Stanley Drift
Port Stanley Till
Erie Phase deposits
Catfish Creek Till
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other


Borehole ID: LP-MW-22-10
Location: Windham Township, Norfolk County
Easting: 548077E
Northing: 4747497N
Elevation: 236.93
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine- textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Catfish Creek Till
Pre-Catfish Creek Drift
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other


Borehole ID: LP-MW-23-10
Location: Windham Township, Norfolk County
Easting: 516038E
Northing: 4749508N
Elevation: 270.32
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Port Stanley Drift
Fine-textured Erie Phase deposits
Catfish Creek Till
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other


Borehole ID: LP-MW-24-10
Location: Dereham Township, Norfolk County
Easting: 543511E Northing: 4743760N
Elevation: 234.57 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Wentworth Drift (Paris Moraine)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Coarse-textured Erie basin glaciolacustrine deposits (Ypsilanti Low?)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Port Stanley Drift
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
50 600 ± 3700 14C yr BP
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other


Borehole ID: LP-MW-25-10
Location: Dereham Township, Norfolk County
Easting: 557556E Northing: 4744623N
Elevation: 227.98 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Fill
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Coarse-textured Erie basin glaciolacustrine deposits (Ypsilanti Low?)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lakes Maumee, Arkona?)
Catfish Creek Drift
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
14 165 ± 45 14C yr BP
detrital organics
fill
topsoil
clay
silt
clay/silt rhythmites
Lithology
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other


Borehole ID: LP-MW-26-10
Location: Charlotteville Township, Norfolk County
Easting: 524291E Northing: 4745915N
Elevation: 230.07 m asl
Depth (m)
Detailed Lithology
Interpretation
Grain Size (%) sand/silt/clay
Total Carbonate (%)
Ca/Do Ratio
Pebble Lithology
Recovery %
Coarse-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Fine-textured Erie basin glaciolacustrine deposits (Glacial Lake Whittlesey-Warren)
Port Stanley Till
Fine- to coarse-textured Erie Phase deposits
Catfish Creek Till
Paleozoic bedrock
Clay
Silt
Sand
Gravel
Bedrock
detrital organics
Lithology
fill
topsoil
clay
silt
clay/silt rhythmites
silt/clay rhythmites
sand/clay rhythmites
very fine- to fine-textured sand
fine- to medium-textured sand
medium- to coarse-textured sand
gravelly sand
gravel
diamicton silty/sandy
diamicton silty/clayey
Paleozoic bedrock
Pebble Lithology
% Precambrian
% Limestone
% Dolostone
% Chert
% Sandstone
% Other

Appendix 2

Written Borehole Logs

LP-MW-01-10

Location: 557649m E 4740832m N, NAD83, Zone 17
Screened Interval: 3.7-6.7 m

Depth	Description
0.0-0.6 m	Brown to black **topsoil**; sharp lower contact.
0.6-0.65 m	Brown mildly oxidized medium-textured **sand**; very minor silt; sharp but deformed lower contact.
0.65-3.75 m	Grey-brown to tan-brown clayey **silt** to silty clay, some medium-textured sand and silt stringers; laminae and beds up to 2 cm thick, showing deformation and dewatering structures; possible clayey silt rhythmites, twelve between 2.4 and 2.75 m, and two up to 5 cm thick at 3.25 m and 3.4 m; sharp lower contact. Sample at 1.25-1.3 m, 2.2-2.25 m, 3.3-3.35 m.
3.75-4.5 m	No recovery, likely brown medium- to coarse-textured sand as below.
4.5-5.25 m	Brown medium- to coarse-textured **sand**, minor silt; minor pea to pebble gravel, clasts are limestone, subrounded to rounded, and polished; gradational lower contact. Sample at 4.75-5.0 m.
5.25-5.4 m	Orange-brown clayey-**silt**; deformed lower contact.
5.4-6.7 m	Brown medium- to coarse-textured **sand**; horizontal laminae between 6.3 and 6.35 m; sand coarsens to granule gravel at 6.65 m; sharp lower contact. Sample at 6.2-6.55 m.
6.7-8.0 m	Clean granule to cobble **gravel**, subrounded to rounded and polished; clasts are limestone; sharp lower contact.
8.0-8.4 m	Oxidized grey-brown silty **clay** to clayey silt; silt laminae, minor red grits, rare granule gravel; gradational lower contact.
8.4-10-5 m	Oxidized brown silty sandy pea to pebble **gravel**; clasts are rounded and polished, limestone; sharp lower contact. Sample at 10.25-10.3 m.
10.5-12.00 m	Grey-brown with mauve hue clayey **silt** to silty very fine-textured sand; highly laminated and bedded; dewatering structures; bands of ice-rafted debris; red shale granules up to 1 cm in diameter; minor limestone pebbles up to 2 cm in diameter. Sample at 10.75-10.8 m.
12.00-22.50 m	Pale grey silty very fine-textured **sand** with grits and granules (ice-rafted debris); red and grey clay rip-up clasts and granules; some ripples, cross-bedding, and heavy mineral streaking; silty clay to clayey silt rhythmite beds, upper part of rhythmites is reddish grey, lower part is dark grey, rhythmites occur at 12.0-12.04 m, 12.1-12.13 m, 12.45-12.5 m, 12.6-12.62 m, 12.7-12.72 m, 12.85-12.87 m, 13.02-13.04 m, 13.25-13.27 m, 13.45-13.48 m, 13.8-13.85 m, 14.05-14.10 m, 14.2-14.25 m, 14.45-14.8 m, 15.1-15.15 m, 15.25 m, 15.5 m, 16.6 m, 16.77 m, 17.18 m, 17.4 m, 17.6 m, 17.75 m, 18.00-18.05 m, 18.6-18.65 m, 18.8-18.85 m, 18.9-18.95 m, 19.0-19.03 m, 19.75 m, 20.00-20.02 m, 20.6-20.75 m, 21.2-21.22 m, and 21.48-21.53 m; band of grey ice-rafted debris, silt and clay between 19.8 and 20.05 m; organic material observed between 16.5 and 18.0 m. Samples at 12.25-12.3 m, 13.75-13.8 m, 15.75-15.8 m, 17.65-17.8 m, 18.5-18.55 m, 20.5-20.55 m, 21.4-21.45 m.

22.5-23.25 m	Grey-brown with mauve hue clayey **silt**; silt stringers; silt rip-up clasts; ice-rafted debris, minor lamination, deformed; sharp but dipping lower contact. Sample at 23.00-23.05 m.
23.25-24.25 m	Pale grey silty very fine-textured **sand**; grey-brown with mauve hue clayey silt laminae; rip-up and drop clasts; dewatering and deformation structures; much ice-rafted debris; sharp lower contact. Sample at 23.45-23.5 m.
24.25-24.75 m	Grey-brown with mauve hue, clayey **silt**; horizontal laminae; red shale ice-rafted debris granules; red clay granules and rip-up clasts; gradational lower contact. Sample at 24.5-24.55 m.
24.75-26.4 m	Compact grey-brown with mauve hue sandy silt **diamicton**; approximately 25% grits to pebbles, predominantly limestone; minor silt stringers, but otherwise massive; sharp but faulted lower contact. Sample at 24.95-25 m, 25.95-26.00 m.
26.4-28.00 m	Pale grey silty very fine-textured **sand** to sandy silt with grey silty clay laminae and beds; sediments are folded, faulted, and exhibit dewatering structures; sharp lower contact. Sample at 26.75-26.8 m, 28.00-28.05 m.
28.00-28.65 m	Grey-brown with mauve hue sandy **silt** to clayey silt; subhorizontal silt laminae, ~5% grits and granules to pebbles; clasts are limestone; possible debris flow between 28.00 and 28.20 m; sharp lower contact.
28.65-31.5 m	Pale grey limestone **bedrock**; fossiliferous, with chert nodules.

LP-MW-02-10

Location: 556842m E 4747557m N, NAD83, Zone 17
Screened Interval: 3.0-6.1 m, 10.1-11.6 m

Depth	Description
0.0-0.50 m	Dark brown sandy **topsoil**; sharp lower contact.
0.50-1.50 m	Oxidized brown fine- to very fine-textured **sand**; laminae, ripples, and cross-bedding; gradational lower contact. Sample at 0.8-0.85 m.
1.50-2.00 m	Oxidized brown silty very fine-textured **sand** to sandy silt; minor very fine-textured sand laminae; gradational lower contact. Sample at 1.7-1.75 m.
2.00-9.50 m	Oxidized tan silty very fine-textured **sand**; some ripples, cross-bedding, and heavy mineral streaking; grey-brown clay rhythmites at 2.25 m, 3.10 m, 3.35 m, 3.7 m, 3.9 m, 4.0 m, 4.15 m, 4.4 m, 4.6 m, 5.15 m, 5.25 m, 5.5 m, 5.75 m, 6.0 m, 6.25 m, 6.4 m, 6.7 m, 7.0 m, 7.2 m, 7.45 m, 7.6 m, 7.8 m, 8.6 m, 8.75 m, 8.9 m, 9.05 m, 9.2 m, 9.35 m; rhythmites are 0.5 to 1.5 cm thick; gradational lower contact. Sample at 4.75-4.8 m, 6.0-6.05 m, 7.5-7.55 m, 8.8-8.85 m.
9.50-11.00 m	Poor recovery. Tan pea to pebble **gravel** and medium- to coarse-textured sand; pebbles are mostly limestone, with some minor granite clasts; gravel are subrounded to rounded and polished; sharp lower contact. Sample at 10.4-10.5 m.
11.00-11.25 m	Oxidized tan silty very fine-textured **sand**; minor ripples, cross-bedding, and heavy mineral streaking; gradational lower contact.
11.25-11.75 m	Tan pea to pebble **gravel** and medium- to coarse-textured sand; pebbles are mostly limestone, with some minor granite clasts; clasts are subrounded to rounded and polished; sharp lower contact.
11.75-11.90 m	Granule to pebble **gravel**; clasts are subrounded to rounded and polished limestone; subangular grits also observed; sharp lower contact.
11.90-14.00 m	Brown coarse-textured **sand**; ~10% pea to pebble gravel; minor silt; gradational lower contact. Sample at 11.9-12.00 m.
14.00-15.50 m	Brown coarse-textured **sand**, minor silt and 10-15% pea to pebble gravel; clasts are subrounded to rounded and polished limestone; sharp lower contact. Sample at 14.7-14.75 m.
15.50-17.6 m	Granule to pebble **gravel**; granule gravel is subangular to rounded, whereas pebble gravel is rounded and polished, limestone; sharp lower contact. Sample at 16.0-16.10 m.
17.6-20.40 m	Brown coarse-textured **sand**, minor silt and minor pea gravel; elongated red-brown clay ball inclusion at 20.25 m, approximately 2 cm in diameter; sharp lower contact. Sample at 18.0-18.1 m, 18.75-18.85 m, 20.25-20.35 m.
20.40-20.75 m	Brown silty coarse-textured **sand** to granular and pea gravel; sharp lower contact.
20.75-21.00 m	Brown silty medium-textured **sand**, minor coarse-textured sand; grits to pebble gravel; sharp lower contact.
21.00-21.15 m	Gneissic cobble.

21.15-35.00 m	Grey-brown silty very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; ice-rafted debris between 22.25 and 22.4 m; some red and grey clay balls, drop clasts; deformation and folding and faulting of rhythmites and incorporation of overlying and underlying silts and silty very fine-textured sand; rare limestone pebbles; red-brown silty clay rhythmites 1-2 cm thick at 22.0 m, 22.15 m, 22.25 m, 22.35 m, 22.65 m, 22.8 m, 23.0 m, 23.23 m, 23.3 m, 23.55 m, 23.75 m, 24.15 m, 24.3 m, 24.75 m, 25.0 m, 25.6 m, 26.0 m, 26.2 m, 26.35 m, 26.55 m, 26.65 m, 26.75 m, 26.85 m, 26.97 m, 27.02 m, 27.15 m, 27.25 m, 27.75 m, 27.95 m, 28.5 m, 29.1 m, 29.45 m, 30.05 m, 30.7 m, 31.2 m, 31.7 m, 31.95 m, 32.1 m, 32.3 m, 32.5 m, 32.7 m, 32.85 m, 33.05 m, 33.10 m, 33.15 m, 33.25 m, 33.55 m, 33.75 m, 33.9 m, 34 m, 34.05 m, 34.4 m, 34.55 m, 34.65 m; at 33.5 m rhythmites become thicker, and concentration of clay drop clasts within the silty very fine-textured sand increases; gradational lower contact. Sample at 22.45-22.5 m, 24.0-24.05 m, 25.25-25.3 m, 26.45-26.5 m, 28.05-28.10 m, 29.55-29.6 m, 31.71-31.75 m, 32.95-33 m, 34.55-34.58 m.
35.00-35.35 m	Grey-brown with mauve hue clayey **silt**; many silt stringers, faulted and deformed; rare limestone pea gravel; sharp lower contact.
35.35-35.55 m	Pale tan silty very fine-textured **sand** to sandy silt; many grey clay granules, drop clasts, and grits; sediment is deformed, showing dewatering structures; dipping but sharp lower contact.
35.55-35.75 m	Grey-brown clayey **silt**; upper half of this unit consists of deformed silt laminae which become more massive and increasingly red in hue at the base; sharp lower contact. Sample at 35.72-35.75 m.
35.75-36.00 m	Pale grey silty very fine-textured **sand** to sandy silt; horizontal bedding, ripples, and minor grits; sharp lower contact.
36.00-38.35 m	Grey-brown to red-brown clayey **silt** and pale grey silty very fine-textured sand; silt laminae, red shale drop clasts, some deformation; pea gravel present in sand bed at 36.2 m; clayey silt rhythmites at 36.7-36.8 m, 36.9-36.93 m, 37.1-37.2 m, 37.55-37.65 m, 37.95-38 m; silt bed at base of this unit; sharp lower contact. Sample at 37.6-37.65 m.
38.35-38.85 m	Compact pale grey silty sandy **diamicton**; massive with 5-10% limestone grits to pebbles; Port Stanley Till; sharp lower contact. Sample at 38.6-38.65 m.
38.85-41.00 m	Pale grey limestone **bedrock**; fossiliferous with a fractured surface.

LP-MW-03-10

Location: 554367m E 4743782m N, NAD83, Zone 17
Screened Interval: 4.6-7.6 m, 15.8-17.4 m

Depth	Description
0.0-0.75 m	Brown **topsoil**; sharp lower contact.
0.75-8.25 m	Brown medium-coarse- to coarse-textured **sand**; minor subrounded pea gravel; at 1.3-1.4 m silty very fine-textured sand bed with sharp upper and lower contacts; at 3.75-4.0 m sediment coarsens to brown coarse-textured sand with 5% pea to 3 cm pebbles, clasts are subrounded to rounded and polished limestone; gradational lower contact. Sample at 0.8-1.25 m, 1.5-2.5 m, 3.0-3.25 m, 4.0-5.5 m, 5.5-7.0 m, 7.75-8.0 m.
8.25-8.5 m	Brown medium-textured **sand** with minor silt; gradational lower contact.
8.5-11.5 m	Brown coarse-textured **sand**, minor silt; minor pea to pebble gravel, up to 4 cm in diameter; clasts are subrounded to rounded and polished limestone; sharp lower contact. Sample at 8.5-10.0 m, 10.0-11.5 m.
11.5-16.65 m	Grey-brown medium- to coarse-textured **sand**, minor silt; grey-brown with mauve hue clayey silt bed 1 cm thick at 11.55 m; at 12.25-12.35 m coarse-textured sand; organic material observed at 16.0-17.5 m; sharp but dipping and deformed lower contact. Sample at 11.5-13.0 m, 13.0-14.5 m, 14.5-16.0 m, 16.25-16.5 m.
16.65-16.9 m	Grey-brown medium-fine-textured **sand** to fine-textured sand; ripples, cross-bedding and heavy mineral streaking; sharp lower contact. Sample at 16.75-16.85 m.
16.9-17.00 m	Grey-brown medium- to coarse-textured **sand**, minor silt; sharp lower contact.
17.00-20.85 m	Grey-brown medium-fine-textured **sand** to fine-textured sand; ripples, cross-bedding and heavy mineral streaking; rare grey clay laminae and stringers; fines to silty fine- to very fine-textured sand; at 19.75 m grey silty clay to clayey silt bed; grey clay laminae at 19.85 m; organic material observed at 17.5-20.5 m; sharp lower contact. Sample at 17.5-19.00 m, 19.0-20.5 m.
20.85-20.95 m	Laminated pale grey to grey-brown silty very fine-textured **sand** and silt; sediment is deformed; sharp and deformed lower contact.
20.95-21.00 m	Grey-brown with mauve hue clayey **silt**; sharp but deformed lower contact.
21.00-21.05 m	Pale grey silty very fine- to fine-textured **sand**; sharp lower contact.
21.05-31.00 m	Grey-brown with mauve hue clayey **silt** to pale grey silty very fine-textured sand; massive sections, with many laminae and beds; red shale granules, minor pebbles (up to 2 cm diameter); pebbles are subangular to subrounded limestone; large concentrations of ice-rafted debris in some sections; much folding and faulting; gradational lower contact. Sample at 21.25-21.3 m, 22.55-22.6 m, 24.00-24.05 m, 25.75-25.8 m, 27.5-27.53 m, 28.25-28.3 m, 30.4-30.45 m.
31.00-34.3 m	Grey-brown with mauve hue clayey **silt**; bands of ice-rafted debris; dark grey gritty very fine-textured sand to clayey silt at 31.95 m, 32.02 m, and 32.15 m; red grits, silt stringers and drop clasts observed; clay content increases at 33.25 m; pebbles at 34.25-34.3 m, up to 1 cm diameter dark grey subangular to subrounded limestone; gradational lower contact. Sample at 31.9-31.95 m, 33.25-33.3 m.

34.3-35.00 m	Grey-brown with mauve hue clayey silt **diamicton**; soft, with many grits, granules and silt stringers, minor laminae; gradational lower contact. Sample at 34.5-34.55 m.
35.00-35.04 m	Grey silty very fine-textured **sand**; sharp lower contact.
35.04-37.6 m	Grey-brown with mauve hue clayey silt **diamicton**; soft, with many grits, granules and silt stringers, minor laminae; becomes grittier with pea gravel at 35.5 m; coarse-textured sand and silt at 36.3-36.45 m; gradational lower contact. Sample at 36.0-36.05 m.
37.6-40.00 m	Grey-brown with mauve hue clayey **silt** to pale grey silty very fine-textured sand; laminae, silt stringers, folding, faulting, and minor grits and granules; fines at 38.5 m with massive clayey silt sections; many fine laminae at base; gradational lower contact. Sample at 37.75-37.8 m, 38.95-39 m.
40.00-41.55 m	Grey-brown to pale grey to red-brown laminated clayey **silt** to silty very fine-textured sand; silty very fine-textured sands are faulted and deformed, dewatering structures; possible rhythmites 1-3 cm thick at 40.3 m, 40.45 m, 40.7 m, 40.8 m, 49.95 m, 41.00 m, 41.05 m, 41.1 m, 41.2 m, 41.25 m, and 41.3 m; gradational lower contact. Sample at 40.2-40.25 m.
41.55-42.2 m	Pale grey compact silty sand **diamicton**; grits and granules up to 4 cm, subangular limestone; sharp lower contact. Sample at 41.75-47.8 m.
42.2-42.25 m	Grey limestone cobble **gravel**; clasts are striated subrounded and polished. Sharp lower contact.
42.25-42.5 m	Pale grey limestone **bedrock**; fossiliferous and fractured.

LP-MW-04-10

Location: 553695m E 4743091m N, NAD83, Zone 17
Screened Interval: 3.0-6.1 m, 11.6-13.1 m, 18.9-22.0 m

Depth	Description
0.0-0.75 m	Brown-black **topsoil**; green limestone cobble at 0.65 m; sharp lower contact.
0.75- 0.85 m	Grey silty very coarse-textured sand to granular **gravel**; sharp lower contact.
0.85-0.95 m	Grey medium- to coarse-textured **sand** and minor pea gravel; clasts are subrounded to rounded and polished limestone; sharp lower contact.
0.95-2.5 m	Oxidized brown medium-textured sand, minor **silt**; four strongly oxidized beds between 1.8 and 2.05 m; minor heavy mineral streaking, otherwise sands are massive; gradational lower contact. Sample at 1.15-1.25 m, 2.25-2.35 m.
2.5-3.5 m	Brown to oxidized-brown medium- to medium-fine-textured **sand**; horizontal heavy mineral streaking, some rust coloured sections; drill mud infused with sand in sections; sharp lower contact.
3.5-4.0 m	Brown medium- to coarse-textured **sand**, minor granule to pea gravel; sharp lower contact. Sample at 3.55-3.75 m.
4.0-8.5 m	Brown medium- to coarse-textured **sand** and granule gravel; minor pebble gravel beds; becomes siltier at 7.5 m; gradational lower contact. Sample at 5.1-5.5 m, 6.3-6.5 m, 7.75-7.85 m.
8.5-10.00 m	Brown coarse-textured **sand** and minor silt; minor pea to pebble gravel; clasts are subrounded to rounded and polished limestone; gradational lower contact. Sample at 9.0-9.25 m.
10.00-11.50 m	Brown medium-coarse-textured **sand**, minor silt; gradational lower contact. Sample at 10.25-11.00 m.
11.5-13.00 m	Brown coarse-textured **sand**, minor granular to pea gravel; drill mud infused with sand; gradational lower contact. Sample at 12.5-12.75 m.
13.00-14.5 m	Brown medium-coarse-textured **sand** to granule gravel, minor silt; gradational lower contact. Sample at 13.00-14.5 m.
14.5-16.35 m	Brown coarse-textured **sand** to pea gravel and minor pebble gravel; minor medium-textured sand and silt; gradational lower contact. Sample at 15.5-15.75 m.
16.35-23.5 m	Massive brown medium-textured **sand**; heavy mineral streaking at 21.85-22.00 m; gradational lower contact. Sample at 16.55-16.85 m, 17.5-19.00 m, 19.00-20.5 m, 20.5-22.0 m, 22.00-23.5 m.
23.5-26.00 m	Brown medium-textured **sand**, clean and massive; red-brown clay balls at 24.45 m overlain by 0.5 cm deformed clay beds interbedded with medium-textured sand; pea to pebble gravel at 24.9 m; sharp lower contact. Sample at 23.6-24.25 m, 25.2-25.6 m.
26.00-26.5 m	Grey-brown with mauve hue silty very fine-textured **sand**; grits and granules to pea gravel; clasts are subangular grey limestone; minor silt stringers, otherwise massive; becomes sandier between 26.3 and 26.35 m; gradational lower contact. Sample at 26.2-26.25 m.

26.5-32.5 m	Grey-brown with mauve hue, irregular beds of sandy **silt**, silty very fine-textured sand and clayey silt; highly deformed laminae, with some massive sections; grits and granules, minor red shale, ice-rafted debris; grey silt bed at 27.9 m; dark grey ice-rafted debris beds at 28.45-28.55 m, 28.75-29.00 m; grey and red silty clay balls within the silty very fine-textured sand; dewatering structures, faults and deformation; red shale granules; clay-rich sections at 31.9-32.15 m; gradational lower contact. Sample at 26.95-27.0 m, 29.00-29.05 m, 30.5-30.55 m, 32.0-32.05 m, 32.25-33.30 m.
32.5-34.45 m	Soft grey-brown with mauve hue clayey silt **diamicton**; silt stringers, minor colour banding, ~5% grits to 5 cm pebbles, mostly limestone; silt beds at 33.6-33.65 m ice-rafted debris and grey clay beds; becomes siltier with great concentration of grits at 34.00 m; sharp lower contact. Sample at 34.7-34.75 m.
34.45-34.5 m	Massive grey-brown with mauve hue, clayey **silt** to silty clay; gradational lower contact.
34.5-34.85 m	Soft grey-brown with mauve hue clayey silt **diamicton**; large concentration of grits; gradational lower contact.
34.85-37.3 m	Grey-brown with mauve hue clayey **silt**; silt laminae with <5% grits and granules; variation in sediment colour; gradational lower contact. Sample at 35.00-35.05 m, 35.95-36.00 m.
37.3-38.5 m	Grey-brown with mauve hue clayey silt, to silty very fine-textured sandy **diamicton**; silt stringers, many grits and granules; massive; red shale grits; limestone dominate clast lithologies; minor variations in sediment hue; gradational lower contact. Sample at 37.5-37.55 m.
38.5-40.00 m	Cobble **gravel** and clayey silt with silty very fine-textured sand caps; gradational lower contact.
40.0-40.25 m	Grey-brown with mauve hue sandy silt to clayey silt **diamicton**; grits and granules to pea and small pebble gravel; ice-rafted debris; debris flow; gradational lower contact. Sample at 40.15-40.2 m.
40.25-40.35 m	Pale grey to red-brown sandy **silt** to clayey silt; deformed beds and laminae, minor grits and granules; gradational lower contact.
40.35-41.5 m	Grey-brown to pale grey silty very fine-textured **sand** to sandy silt; grits and granules, and deformed laminae; gradational lower contact.
41.5-43.55 m	Pale grey to grey-brown with mauve hue silty very fine-textured **sand**; grey-brown to red-brown rhythmites 1-2 cm thick often faulted or deformed at 41.6 m, 41.75 m, 41.8 m, 41.95 m, 42.05 m, 42.1 m, two between 42.25 and 42.3 m, ~5 between 42.3 and 42.5 m, 42.65 and 42.7 m; minor clay ball drop clasts, grits and granules; some red shale granules; sharp lower contact. Sample at 42.15-42.2 m, 43.45-43.5 m.
43.55-46.0 m	Grey to grey-blue limestone **bedrock**; fossiliferous with chert nodules.

LP-MW-05-10

Location: 553657m E 4745937m N, NAD83, Zone 17
Screened Interval: 1.2-4.3 m, 11.9-14.9 m

Depth	Description
0.0-0.25 m	Black **topsoil**, gradational lower contact.
0.25-0.8 m	Oxidized brown silty fine-textured **sand**; lowermost 1 cm of this unit is silty clay; sharp lower contact.
0.8-2.0 m	Oxidized brown clayey **silt**; some horizontal banding, minor clay balls, very minor grits; seven rhythmites consisting of 0.5 cm orange clay overlying 0.5 cm brown silt; additional rhythmites located at 1.65 m, 1.75 m, and 1.85 m; gradational lower contact. Sample at 1.15-1.2 m, 1.75-1.8 m.
2.0-2.9 m	Oxidized tan-brown **silt**; horizontal bedding and grey silt laminae; orange clay beds, 0.5-1.0 cm thick at 2.1 m, 2.2 m, 2.25 m, 2.35 m, 2.45 m, 2.5 m and 2.6 m; sharp lower contact. Sample at 2.75-2.8 m.
2.9-3.0 m	Brown medium-textured **sand** with silt and clayey silt laminae; laminae are deformed; sharp lower contact.
3.0-3.05 m	Brown medium-coarse-textured **sand**; some red grits; sharp lower contact.
3.05-3.10 m	Brown silty fine-textured **sand**; gradational lower contact.
3.10-3.6 m	Brown medium-fine-textured **sand**; heavy mineral streaking and minor clay balls; sharp lower contact.
3.6-5.0 m	Brown massive medium-coarse- to coarse-textured **sand**; minor silt stringers and minor clay balls (~0.5 cm in diameter); gradational lower contact. Sample at 3.65-4.4 m.
5.0-6.5 m	Massive brown medium- to medium-coarse-textured **sand**; minor grits and granules, minor heavy mineral concentrations; fines to medium-fine-textured sand at 5.8-5.85 m; gradational lower contact. Sample at 5.0-6.0 m.
6.5-8.0 m	Poor recovery; loose pea to pebble **gravel**; clasts are subrounded to rounded and polished limestone; medium-coarse-textured sand matrix; gradational lower contact. Sample at 6.5-7.25 m.
8.0-8.9 m	Brown coarse-textured **sand** and granule to pebble gravel with minor silt; clasts are subrounded to rounded, predominantly limestone; sharp but deformed lower contact. Sample at 8.3-8.4 m.
8.9-9.5 m	Grey-brown fine- to very fine-textured **sand**; grey clay beds at 8.9 m and 9.25 m; some inclusions and beds of coarse-textured sand to granule gravel; gradational lower contact. Sample at 9.0-9.1 m.
9.5-9.7 m	Grey granular **gravel**; gradational lower contact.
9.7-11.00 m	Grey-brown silty fine- to very fine-textured **sand**; heavy mineral streaking and minor silt stringers; deformed ripples and cross-bedding; gradational lower contact. Sample at 9.8-10.6 m.
11.00-11.6 m	Grey-brown fine- to very fine-textured **sand**; sharp lower contact.

11.6-11.8 m	Brown clayey **silt**; gradational lower contact.
11.8-12.5 m	Massive grey-brown fine- to very fine-textured **sand**; gradational lower contact. Sample at 12.0-12.1 m.
12.5-13.15 m	Grey-brown fine- to medium-fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; sharp lower contact. Sample at 12.75-12.8 m.
13.15-14.00 m	Grey-brown silty very fine- to fine-textured **sand**; horizontal bedding, minor grey clay balls; at 13.25 m ~4 cm inclusion of grey clay and silty very fine-textured sand; minor red clay inclusions; gradational lower contact. Sample at 13.7-13.75 m.
14.00-14.7 m	Grey-brown silty fine- to very fine-textured **sand** and sandy silt; some bedding and laminae, partially deformed; red clay granules, grey and red clay balls, ice-rafted debris; sharp lower contact. Sample at 14.15-14.25 m.
14.7-14.95 m	Massive grey-brown fine- to very fine-textured **sand** to sandy silt; sharp lower contact. Sample at 14.75-14.79 m.
14.95-15.05 m	Grey-brown clayey **silt** and silty very fine-textured sand; deformed lower contact.
15.05-15.5 m	Grey-brown silty fine- to very fine-textured **sand** and sandy silt; some bedding and laminae, partially deformed; red clay granules, grey and red clay balls, ice-rafted debris; gradational lower contact.
15.5-16.3 m	Grey-brown silty very fine- to fine-textured **sand** and silt; folded and faulted beds; minor dark grey clay beds and minor clay drop clasts; sharp and dipping lower contact. Sample at 15.95-16.00 m.
16.3-17.00 m	Dark grey-brown **silt**, sandy silt, silty very fine-textured sand and clayey silt; grits and granules; silt stringers; deformed red and grey clay balls; red debris band at 16.4-16.44 m; subrounded limestone pebbles up to 1-2 cm; the bottom of this unit is gritty silty clay with a reddish hue; gradational lower contact. Sample at 16.5-16.55 m.
17.00-18.05 m	Grey-brown with mauve hue clayey **silt**; ~5% grits to granular gravel; deformed silt stringers, otherwise massive; minor pale grey clay balls; between 18.0 and 18.05 m many ice-rafted grits and granules; sharp lower contact. Sample at 17.2-17.25 m.
18.05-18.5 m	Massive pale grey-brown silty very fine-textured **sand**; normally faulted silty clay and clayey silt beds and laminae between 18.05 and 18.10 m; organic material observed at 18.05-18.5 m. Sample at 18.25-18.3 m.
18.5-20.0 m	Grey-brown silty very fine-textured **sand** with silty clay beds; silt stringers; clay balls, grits and granules; red clay balls; high concentration of ice-rafted debris at 19.75 m; folding and faulting of beds; gradational lower contact. Sample at 19.5-19.55 m.
20.0-20.15 m	Grey-brown sandy **silt** and ~5% grits to granular gravel; ice-rafted debris; debris flow; sharp lower contact.
20.15-20.5 m	Interbedded silty very fine-textured **sand** and clayey silt with red and grey grits and granules; grey drop clasts and interclasts; highly faulted; red clay sections; deformed but sharp lower contact.
20.5-20.85 m	Grey-brown silty very fine- to fine-textured **sand** with clayey silt beds and laminae; normally faulted; sharp and deformed lower contact.
20.85-22.7 m	Pale grey-brown silty very fine-textured **sand**; grey and red clay grits and granules; some highly deformed ripples and cross-bedding; sharp lower contact. Sample at 21.1-21.2 m, 22.2-22.25 m.

22.7-22.9 m	Pale grey-brown silty very fine-textured **sand**; grey and red clay beds; faulted and deformed; large concentrations of grits and granules; sharp lower contact.
22.9-23.00 m	Grey-brown with mauve hue clayey **silt**; massive with ~5% grits and granules; pale grey granular inclusions; gradational lower contact. Sample at 22.9-22.95 m.
23.00-26.4 m	Soft grey-brown clayey silt **diamicton**; ~5% grits and granules; minor pea gravel; appears massive but contains silt stringers and grey clay granules; at 25.4-25.6 m silty very fine-textured sand with limestone grits and granules up to 1 cm; sharp lower contact. Sample at 23.5-23.55 m, 25.0-25.05 m, 26.2-26.25 m.
26.4-26.5 m	Grey-brown with mauve hue clayey **silt**; silt stringers; dark grey clay bed (1 cm thick) at 26.5 m; sharp lower contact.
26.5-26.7 m	Grey-brown medium-fine-textured **sand**; heavy mineral streaking; ripples and cross-bedding; silt stringers; sediment is deformed; sharp lower contact.
26.7-27.5 m	Grey-brown with mauve hue clayey **silt** and silty medium-fine- to fine-textured sand beds. Clay beds at 26.7-26.85 m, 26.9-27.0 m, 27.1-27.14 m (dipping), and 27.25 m (deformed); some red clay intraclasts; highly deformed at 27.25-27.5 m; dewatering structures, folding and faulting; gradational lower contact. Sample at 27.0-27.1 m.
27.5-27.7 m	Grey-brown with mauve hue clayey **silt** to silty clay; some dark grey beds; red and pale grey granules and clay balls; silty very fine-textured sand; sharp and dipping lower contact.
27.7-28.6 m	Grey-brown silty fine- to very fine-textured **sand**; heavy mineral concentrations; ripples and cross-beds; silt beds, grits and granules; grey and red clay balls, ice-rafted debris; folding, faulting, deformation; sharp lower contact. Sample at 28.2-28.25 m.
28.6-28.7 m	Grey-brown with mauve hue sandy **silt**; clayey silt sections; rip up of underlying sands; sediment is deformed; deformed lower contact.
28.7-28.75 m	Grey-brown silty very fine-textured **sand**; minor drop clasts; rip ups and clay balls; sharp lower contact.
28.75-29.0 m	Grey-brown to grey-brown with mauve hue **silt**, silty clay, clayey silt and silty very fine- to fine-textured sand; normal and shear faults; minor drop clasts; gradational lower contact.
29.0-30.5 m	Compact grey-brown with mauve hue sandy silt **diamicton**; ~5-10% grits to 1 cm gravel, limestone; silt stringers but otherwise massive; gradational lower contact. Sample at 29.75-29.8 m.
30.5-33.5 m	Grey-brown with mauve hue clayey silt **diamicton**; silt stringers; ice-rafted debris in bands; red shale grits and granules; silt beds and stringers are deformed; subrounded limestone pebbles at 30.85 m and 31.7 m, up to 3-4 cm in diameter; gradational lower contact. Sample at 31.25-31.3 m, 32.45-32.5 m.
33.5-36.5 m	Pale grey to grey-brown with mauve hue clayey **silt** to silty very fine-textured sand; grits and granules, some clay intraclasts and red shale; beds are highly faulted; normal faults; some beds are subvertical; beds vary from 3-15 cm in thickness; sediments overridden by ice and deformed; possible debris flows at 35.35-35.5 m, and 35.8-35.95 m; some clay-rich silt beds; becomes silty very fine-textured sand at 35.95-36.5 m with a deformed silty clay bed at 36.35 m; gradational lower contact. Sample at 34.5-34.55 m, 36.2-36.25 m.
36.5-41.00 m	Grey-brown silty very fine-textured **sand** and grey-brown to reddish grey brown clay to clayey silt rhythmites; clay rhythmites are gritty with ice-rafted debris, faulted in sections; clayey silt to silty clay rhythmites at 36.5 m, 36.6 m, 36.9 m, 37.25 m, 37.55 m, 37.6 m, 37.7 m, 37.75 m, 37.85 m, 38.15 m, 38.2 m, 38.25 m, 38.35 m, 38.5 m, 38.55 m, 38.6 m, 38.75 m, 38.8 m, 39.53 m, 39.65 m, 39.85 m, 39.97 m, 40.05 m, 40.07 m, 40.25 m,

	40.53 m; rhythmites vary in thickness from 2-15 cm; silty very fine-textured sand beds are commonly highly deformed; red shale intraclast at 39.6 m (1-2 cm thick and 3 cm in diameter); at 40.75 m becomes silty fine- to very fine-textured sand with minor clay with silt laminae, grits and granules; gradational lower contact. Sample at 37.05-37.1 m, 38.75-38.78 m, 39.85-39.87 m.
41.00-41.4 m	Grey-brown with mauve hue silty **clay** and silty medium-fine-textured sand; grits to pebbles, clasts up to 5 cm diameter, limestone; deformed and disturbed; sharp lower contact. Sample at 41.25-41.35 m.
41.4-42.0 m	Pea to pebble **gravel**; limestone, polished and striated; silty medium-fine- to medium-textured sand matrix; sharp lower contact.
42.0-44.25 m	Grey-blue limestone **bedrock**; surface is polished and striated; highly fossiliferous, bituminous.

LP-MW-06-10

Location: 552271m E 4747001m N, NAD83, Zone 17
Screened Interval: 5.5-8.5 m, 11.1-12.6 m

Depth	Description
0.0-0.15 m	Brown sandy **topsoil**; gradational lower contact.
0.15-1.0 m	Oxidized brown silty very fine-textured **sand** to sandy silt; highly disturbed, likely due to agricultural practices; gradational lower contact.
1.0-1.5 m	Oxidized brown silty very fine-textured **sand** to sandy silt; minor horizontal laminae; gradational lower contact. Sample at 1.0-1.05 m.
1.15-5.8 m	Oxidized brown sandy **silt**; horizontal bedding; some deformation; grey-brown clayey silt rhythmites at 2.15-2.17 m, 2.3-2.32 m, 2.6-2.61 m, 2.73-2.74 m, 3.5-3.51 m, 3.7-3.72 m, 3.76-3.78 m, 3.8-3.81 m, 3.95-3.97 m, 4.0-4.01 m, 4.05-4.06 m, 4.15-4.16 m, 4.22-4.24 m, 4.28-4.29 m, 4.31-4.32 m, 4.35-4.36 m, 4.45-4.47 m, 4.5-4.51 m, 4.55-4.56 m, 4.63-4.64 m, 4.6-4.67 m, 4.72-4.73 m, 4.77-4.78 m, 4.81-4.82 m, 4.9-4.91 m, 4.95-4.96 m, 5.0-5.01 m, 5.05-5.06 m, 5.15-5.16 m, 5.2-5.21 m, 5.5-5.6 m, 5.3-5.31 m, 5.35-5.36 m, 5.4-5.41 m, 5.5-5.51 m, 5.55-5.6 m, 5.6-5.61 m, 5.65-5.66 m, 5.7-5.71 m, 5.76-5.78 m, 5.8-5.81 m; sharp lower contact. Sample at 2.45-2.5 m, 3.23-3.27 m, 4.55-4.6 m.
5.8-6.05 m	Grey-brown fine-textured **sand**; gradational lower contact. Sample at 5.9-5.95 m.
6.05-6.15 m	Clean grey-brown silty fine-textured **sand**; some ripples and cross-bedding; heavy mineral streaking; gradational lower contact.
6.15-6.23 m	Grey-brown silty very fine-textured **sand**; some fine-textured sand laminae; ripples, cross-bedding and heavy mineral streaking; sharp lower contact.
6.23-6.5 m	Grey-brown medium-fine-textured **sand**; some heavy mineral streaking, ripples and cross-bedding; gradational lower contact.
6.5-8.5 m	Brown medium- to medium-coarse-textured **sand**; some silt stringers; minor pea gravel; minor heavy mineral streaking; gradational lower contact. Sample at 7.5-8.0 m.
8.5-14.5 m	Grey-brown medium-textured **sand**; ~10% pebbles, clasts are rounded and polished limestone; sand coarsens to coarse-textured sand at 11.00 m; sharp lower contact. Sample at 8.5-8.6 m, 10.0-11.0 m, 11.0-12.5 m, 12.5-14.0 m.
14.5-17.0 m	Clean grey-brown coarse-textured **sand** and ~10-20% granule gravel; clasts up to 5 cm diameter, rounded polished limestone, minor feldspars and granite clasts; gravel coarsens slightly at 16.5 m and a cobble was observed; sharp lower contact. Sample at 14.5-15.5 m.
17.0-19.0 m	Dark-grey-brown with mauve hue clayey **silt**; deformed silt beds and stringers; dewatering structures; drop clasts, rip-up clasts, grits and granules; pebbly in places; sharp lower contact. Sample at 17.15-17.2 m, 17.85-17.9 m.
19.0-19.9 m	Pale grey to dark grey silty **clay**, clayey silt and sandy silt beds; highly deformed; silt stringers; large concentrations of grits and granules; sharp lower contact.
19.9-20.15 m	Dark grey with mauve hue silty **clay**; some rip up silt and silty very fine-textured sand; silt stringers; minor grits and granules; deformed but sharp lower contact.

20.15-21.25 m	Pale grey silty very fine-textured **sand**; very minor heavy mineral streaking; sharp lower contact. Sample at 20.25-20.3 m.
21.25-21.5 m	Grey-brown sandy **silt**; deformed; silt stringers; minor deformed clay laminae; sharp lower contact.
21.5-21.55 m	Grey-brown clayey **silt** to silty clay; sharp lower contact. Sample at 21.75-21.79 m.
21.55-21.6 m	Pale grey to red-brown silty very fine-textured **sand**; drop clasts and rip-up clasts; deformed red silt stringers; ice-rafted debris; sharp but faulted lower contact.
21.6-22.0 m	Pale grey silty fine- to very fine-textured **sand**; silt stringers and laminae; deformed ripples and cross-bedding; minor grits and granules; gradational lower contact.
22.0-22.25 m	Grey-brown with mauve hue clayey **silt** to silty clay; silt stringers; grits and granules; sharp lower contact.
22.25-22.4 m	Pale grey silty very fine-textured **sand**; minor ripples, cross-bedding, and heavy mineral streaking; deformed lower contact.
22.4-22.55 m	Grey-brown with mauve hue clayey **silt** to silty clay; silt stringers; grits and granules; sharp lower contact. Sample at 22.5-22.55 m.
22.55-22.75 m	Pale grey silty very fine-textured **sand**; minor ripples, cross-bedding, and heavy mineral streaking; sharp lower contact.
22.75-23.5 m	Grey-brown with mauve hue clayey **silt**; silt stringers; grits and granules; debris flow; gradational lower contact.
23.5-26.5 m	Grey-brown to mauve hue clayey silt **diamicton** interbedded with silty very fine-textured sand and silt stringers; many grits and granules; contacts are deformed and silt pulled up into the diamicton; debris flows at 25.00-25.15 m, and 25.55-25.8 m; massive silty clay to clayey silt at 25.5-25.55 m, 25.85-25.9 m, and 26.0-26.5 m; sharp lower contact. Sample at 23.9-23.95 m, 25.75-25.8 m.
26.5-26.7 m	Grey-brown with mauve hue clayey **silt**; massive with grits and granules; deformed lower contact.
26.7-28.00 m	Grey-brown silty very fine- to fine-textured **sand**; some clayey silt stringers ripples, cross-bedding and heavy mineral streaking; minor grey clay rip-up clasts or drop clasts at 27.25 m, dark grey clayey silt to silty clay bed; organic material observed at 26.75-28.0 m; sharp lower contact. Sample at 27.5-27.55 m.
28.00-34.0 m	Pale grey silty very fine-textured **sand**; some ripples, cross-bedding, and heavy mineral streaking; minor clay balls; at 28.25-28.27 m grey-brown clayey silt bed overlying debris bands with ice-rafted debris, red and grey clay granules; rhythmites at 29.2-29.22 m, 29.9-29.92 m, 30.7-30.72 m, 31.15-31.17 m, 31.4-31.6 m, 32.3-32.35 m, 32.4-32.45 m, 32.8-33.05 m, 33.53-33.54 m, 33.75-33.8 m; at 32.8-33.05 m; red rip-up clay clasts; gradational lower contact. Sample at 28.7-28.75 m, 30.45-30.5 m, 32.0-32.05 m, 33.45-33.5 m.
34.0-35.5 m	Grey-brown with mauve hue **silt**; clay rhythmites at 34.15 m, 34.5-34.55 m, 34.74-34.77 m, 34.85-34.87 m, 35.1-35.25 m (several deformed and folded into one another); gradational lower contact. Sample at 34.25-24.3 m.
35.5-37.0 m	Pale grey silty very fine-textured **sand** and clayey silt to silty clay; sands contain ripples, cross-bedding and some heavy mineral streaking, sharp upper and lower boundaries; some red clay rip-up clasts and ice-rafted debris; clayey silt to silty clay is very red in places; silt stringers; some very dark grey beds; deformed in sections; gradational lower contact. Sample at 36.55-36.6 m.

37.0-37.4 m	Grey-brown clayey **silt** to silt; beds and laminae, some faulted; grey clay drop clasts; stringers; clay balls; grey clay clast ~1 cm in diameter at 37.35 m; sharp lower contact.
37.4-37.55 m	Grey-brown with mauve hue clayey silt **diamicton**; red grits and granules up to pebble in size; silt stringers, debris flow; sharp lower contact.
37.55-37.6 m	Dark grey-brown clayey **silt**; bed ~2 cm thick in centre with large concentration of ice-rafted debris, red shale grits; deformed lower contact.
37.6-37.65 m	Grey-brown with mauve hue clayey silt **diamicton**; red grits and granules up to pebble in size; silt stringers, debris flow; sharp lower contact.
37.65-37.75 m	Grey-brown with mauve hue clayey **silt** to silty clay beds; evenly spaced horizontally, 0.5 cm spacing; sharp lower contact.
37.75-37.85 m	Grey-brown with mauve hue clayey silt **diamicton**; red grits and granules up to pebble in size; silt stringers, debris flow; sharp lower contact.
37.85-38.3 m	Grey-brown with mauve hue clayey **silt** and silty clay; mostly massive, minor silt stringers; at 37.85-38 m large concentration of grits and granules, limestone; sharp lower contact.
38.3-39.25 m	Compact brown sandy silt **diamicton**; ~10% grits to pebbles, mostly subangular limestone; Catfish Creek Till; sharp lower contact. Sample at 38.45-38.5 m, 39.2-39.25 m.
39.25-41.5 m	Blue grey limestone **bedrock**; horizontal bedding; fossiliferous.

LP-MW-07-10

Location: 552484m E 4744349m N, NAD83, Zone 17
Screened Interval: 5.5-8.5 m, 11.6-14.6 m

Depth	Description
0.0-0.25 m	Brown-black **topsoil**; gradational lower contact.
0.25-0.5 m	Clean oxidized brown medium- to coarse-textured **sand**; sharp lower contact.
0.5-0.6 m	Oxidized brown silty fine-textured **sand** to sandy silt; sharp lower contact.
0.6-1.2 m	Oxidized brown medium- to coarse-**sand**; horizontally bedded; beds are 1.0-1.5 cm thick; some silty sections; some heavy mineral streaking; sharp lower contact. Sample at 0.7-1.0 m.
1.2-1.25 m	Oxidized brown sandy **silt**; some rip up sand; sharp lower contact.
1.25-1.5 m	Oxidized brown medium- to coarse-textured **sand**; horizontally bedded, beds are 1.0-1.5 cm thick; some silty sections; some heavy mineral streaking; sharp lower contact.
1.5-2.6 m	Oxidized brown medium-textured **sand**, minor silt; some silty sections; some deformation and heavy mineral streaking; clay section at 1.95 m; sharp lower contact. Sample at 1.65-1.7 m, 2.15-2.5 m.
2.6-3.25 m	Oxidized brown to orange-brown clayey **silt**; horizontal laminae; orange-brown clayey silt rhythmites at 2.75 m, 2.8 m, 2.85 m, 2.9 m, 2.95 m, 3.0 m, 3.05 m, 3.1 m, 3.15 m, 3.18 m, 3.25 m; sharp lower contact. Sample at 3.0-3.05 m.
3.25-3.5 m	Oxidized brown medium-textured **sand**; some heavy mineral streaking; gradational lower contact.
3.5-8.0 m	Oxidized brown medium- to coarse-textured **sand**; silt bed at 3.9-3.95 m; some heavy mineral streaking; minor silt laminae; clay ball at 4.5 m; minor pea gravel; some deformation; between 6.0-6.5 m minor rounded pebbles up to 2 cm; gradational lower contact. Sample at 4.0-4.45 m, 5.0-6.5 m, 6.5-8.0 m.
8.0-8.3 m	Grey-brown medium-coarse- to coarse-textured **sand**; minor silt, minor pea gravel; sharp lower contact.
8.3-8.35 m	Blue-grey limestone cobble; fractured by drill.
8.35-8.6 m	Grey-brown silty medium-textured **sand**; ~5% pea gravel at 8.55-8.6 m; gradational lower contact.
8.6-9.5 m	Grey-brown coarse-textured **sand**, minor silt, minor pea gravel; gradational lower contact. Sample at 8.75-9.0 m.
9.5-11.3 m	Grey-brown medium-coarse- to coarse-textured **sand**, minor silt; ~5% pea to pebble gravel, subrounded to rounded and polished limestone; gradational lower contact. Sample at 9.5-11.0 m.
11.3-12.5 m	Grey-brown silty coarse-textured **sand**; minor pea to pebble gravel, subrounded to rounded limestone; gradational lower contact. Sample at 11.35-11.5 m.

12.5-14.00 m	Grey-brown coarse- to medium-coarse-textured **sand**; ~5% pea to pebble gravel; gravel content decreases at 13.25 m; some silty sections; gradational lower contact. Sample at 12.5-13.05 m.
14.00-14.6 m	Massive grey-brown coarse-textured **sand**; deformed but sharp lower contact. Sample at 14.1-14.5 m.
14.6-17.2 m	Grey-brown with mauve hue clayey **silt** to sandy silt; mostly massive but minor silt stringers and laminae; ~5% limestone grits and granules; between 15.15 and 15.25 m sandy silt beds, minor grits and granules; many silt stringers at 15.5-15.6 m; at 15.75-15.8 m fractured grey limestone cobble; gradational lower contact. Sample at 15.0-15.05 m, 16.5-16.55 m.
17.2-18.8 m	Grey-brown with mauve hue sandy **silt**, clast free; irregular and deformed pale brown to tan laminae and beds of silt; dewatering structures present; gradational lower contact. Sample at 18.0-18.05 m, 18.7-18.75 m.
18.8-18.9 m	Grey-brown with mauve hue sandy silt **diamicton**; debris flow; ~5% grits to pebbles, subangular to subrounded limestone; gradational lower contact.
18.9-19.0 m	Grey-brown with mauve hue sandy **silt**, clast free; irregular and deformed pale brown to tan laminae and beds of silt; dewatering structures present; gradational lower contact.
19.0-20.0 m	Grey-brown with mauve hue sandy silt **diamicton**; debris flow; ~5% grits to pebbles, subangular to subrounded limestone; gradational lower contact.
20.0-21.0 m	Grey-brown with mauve hue sandy **silt**; silt stringers; grits, granules, much ice-rafted debris; deformation and dewatering structures; lower contact is sharp and dipping.
21.0-23.00 m	Grey-brown with mauve hue silty fine- to very fine-textured **sand**; grey clay and red clay grits; heavy mineral streaking, ripples and cross-bedding; red shale drop clasts; at 21.2-21.25 m mauve and grey silty clay balls, ~1 cm diameter; faulted; at 21.85-21.87 m grey-brown clay rhythmite; gradational lower contact. Sample at 21.05-21.1 m, 22.5-22.55 m.
23.0-23.45 m	Grey-brown with mauve hue clayey **silt**; deformed silt stringers; ~5% grits and granules; some grey and red clay granules, dropstones; some sandy sections, laminae and stringers; gradational lower contact.
23.45-23.85 m	Reddish silty **clay** to grey-brown clayey silt; silt beds; faulted and deformed; some dark grey silt beds; minor grits and granules; sharp but faulted lower contact.
23.85-24.10 m	Grey-brown with mauve hue clayey silt to sandy silt **diamicton**; many silt stringers; grits and granules; debris flow; sharp lower contact. Sample at 24.0-24.05 m.
24.1-24.15 m	Red-brown clayey **silt** with silt stringers, sharp lower contact.
24.15-24.25 m	Pale grey silty very fine-textured **sand** and sandy silt; red-brown clay inclusions; grey clay balls, drop clasts and rip-up clasts; much ice-rafted debris at 24.22-24.25 m; sharp lower contact.
24.25-24.5 m	Grey-brown with mauve hue clayey **silt**; silt stringers; grits and granules; much ice-rafted debris; subaqueous debris flow; gradational lower contact.
24.5-24.7 m	Grey-brown with mauve hue clayey **silt** to silty clay; grey clay and silt laminae are deformed; grits and granules; ice-rafted debris; dark grey sandy clay; sharp lower contact.
24.7-24.75 m	Deformed ball of grey-brown with mauve hue **diamicton**; grits and granules; encircled by dark grey sandy clay and pale grey silt; deformed but sharp lower contact.

24.75-27.5 m	Grey-brown clayey silt **diamicton**; debris flow; many grits and granules; silt stringers; minor massive, grit-free sections; some deformation and dipping beds between debris flow and clast free sections, red shale clasts; gradational lower contact. Sample at 25.25-25.3 m, 26.5-26.55 m.
27.5-27.9 m	Grey limestone cobble fragments.
27.9-28.25 m	Grey-brown clayey silt **diamicton**; debris flow; many grits and granules; silt stringers; minor massive, grit-free sections; some deformation and dipping beds between debris flow and clast-free sections, red shale clasts; gradational lower contact. Sample at 28.0-28.05 m.
28.25-39.5 m	Grey-brown clayey **silt** to silty clay; many silt beds and laminae; deformed beds; minor limestone pebbles; ice-rafted debris, grits and granules; debris flow or flow till; very compact; gradational lower contact. Sample at 29.5-29.55 m, 31.5-31.55 m, 32.5-32.55 m, 34.0-34.05 m, 35.5-35.55 m, 36.75-36.8 m, 38.2-38.25 m.
39.5-43.5 m	Grey-brown sandy **silt** to clayey silt interbedded and laminated with pale grey sandy silt and silty very fine-textured sand; minor clay; minor grits and granules; some highly deformed sections. Sample at 40.1-40.15 m, 41.5-41.55 m.
43.5-43.75 m	Pale grey silty very fine-textured **sand** capped with dark grey clay ~1-2 cm thick; gradational lower contact. Sample at 43.7-43.75 m.
43.75-45.65 m	Rhythmically bedded pale grey silty very fine-textured **sand** with silt laminae; dark grey-brown to red-brown clayey silt to silty clay; some deformation; drop clasts, grits and granules; 16 clay to clayey silt rhythmites; sharp but deformed lower contact. Sample at 44.6-44.62 m.
45.65-47.2 m	Grey-brown to red-brown clayey **silt** to silty clay; silt laminae; deformed; gradational lower contact. Sample at 45.7-45.75 m, 47.15-47.2 m.
47.2-48.75 m	Pale grey limestone **bedrock**; chert nodules.

LP-MW-08-10

Location: 549453m E 4742765m N, NAD83, Zone 17
Screened Interval: 2.7-5.8 m, 19.2-20.7 m

Depth	Description
0.0-0.3 m	Brown **topsoil**; deformed lower contact.
0.3-1.75 m	Oxidized to grey-brown medium-textured **sand**; some black topsoil inclusions; gradational lower contact. Sample at 0.75-0.85 m, 1.5-1.75 m.
1.75-2.3 m	Brown **topsoil** and oxidized brown medium-textured sand; deformed; gradational lower contact.
2.3-3.25 m	Brown medium-textured **sand**; massive; gradational lower contact. Sample at 2.5-2.75 m.
3.25-6.25 m	Grey-brown medium- to medium-fine-textured **sand**; some mildly oxidized sections; minor horizontal heavy mineral streaking; grey silty very fine-textured sand bed at 5.25 m, 1 cm thick; gradational lower contact. Sample at 3.25-4.75 m, 5.5-5.75 m.
6.25-7.75 m	Brown medium- to medium-fine-textured **sand**; between 6.25 and 7.0 m many horizontal heavy mineral bands, dipping between 6.4 and 6.5 m; gradational lower contact. Sample at 6.25-7.75 m.
7.75-9.25 m	Pale grey silty very fine-textured **sand** laminated with grey-brown to mauve hue silt, sandy silt, clayey silt and silty clay; dark grey and red clay balls; minor heavy mineral streaking; highly folded and faulted; rip-up clasts; dewatering structures observed; gradational lower contact. Sample at 8.9-8.95 m.
9.25-10.75 m	Grey-brown with mauve hue clayey **silt** with silty very fine sand, sandy silt and silty clay; dark grey and red clay balls; deformed bed of ice-rafted debris at 10.0 m; folding, faulting; dewatering structures; gradational lower contact. Sample at 9.4-9.45 m.
10.75-21.25 m	Pale grey silty very fine-textured **sand**; finely laminated clayey silt; clay rip-up clasts; minor grits and granules; folding and faulting; some ripples and cross-bedding in the sands; grey-brown to red-brown clayey silt rhythmites ~1 cm thick at 12.5 m, 12.73 m, 12.9 m, 13.35 m,13.7 m, 14.2 m, 14.5 m, 14.75 m, 15.03 m, 15.75 m, 16.05 m, 16.2 m, 16.4 m, 16.8 m, 16.9 m, 17.25 m, 17.25 m, 17.65 m, 17.95 m, 18.65 m, 18.75 m, 19.05 m, 19.23 m, 19.5 m, 21.1 m; gradational lower contact. Sample at 11.9-12.0 m, 12.3-12.35 m, 13.8-13.85 m, 15.4-15.5 m, 17.0-17.05 m, 18.7-18.75 m, 20.75-20.8 m.
21.25-22.75 m	Brown medium-fine- to medium-textured **sand**; minor heavy mineral streaking, deformed; minor clay laminae and clay balls; gradational lower contact. Sample at 21.5-21.75 m.
22.75-24.25 m	Pale grey silty fine- to very fine-textured **sand**; ripples and cross-bedding; silt section at 23.5-23.55 m; clayey silt rhythmite at 23.4 m; heavy mineral streaking; minor red-brown clay rip-up clasts; gradational lower contact; organic material observed between 22.75 and 24.25 m. Sample at 23.0-23.2 m.
24.25-25.75 m	Grey-brown silty fine- to very fine-textured **sand** to sandy silt; clayey silt laminae; highly deformed; heavy mineral streaking; sandy silt laminae; minor clay balls; gradational lower contact; organic material observed between 24.25 and 25.75 m. Sample at 25.3-25.35 m.
25.75-27.25 m	Irregular beds of deformed grey-brown with mauve hue sandy **silt** to silty very fine-textured sand; minor clay; heavy mineral streaking; ripples and cross-bedding; highly

	deformed, dewatering structures; clayey silt laminae; gradational lower contact. Sample at 26.25-26.5 m.
27.25-28.25 m	Grey-brown medium-textured **sand**; massive, clean; sharp lower contact. Sample at 27.75-28.0 m.
28.25-28.75 m	Grey-brown with mauve hue silty very fine-textured **sand** to sandy silt; minor clayey silt laminae, deformed; clayey silt rhythmite at 28.6-28.65 m; gradational lower contact.
28.75-31.75 m	Grey-brown silty very fine-textured **sand** and silt; rare grey clay balls; minor heavy mineral streaking; minor silty clay to clayey silt laminae; grey-brown with mauve hue clayey silt rhythmite at 30.5-30.55 m; gradational lower contact. Sample at 29.5-29.55 m, 30.9-30.95 m.
31.75-33.6 m	Pale grey silty fine- to very fine-textured **sand**; ripples, cross-bedding, heavy mineral streaking; red-brown clayey silt rhythmite at 31.75-31.77 m; grey and red-brown clay balls, granule in size, rip-up or drop clasts; loose; organic material observed between 31.75-33.25 m; sharp lower contact. Sample at 32.5-32.55 m.
33.6-55.75 m	Grey-brown with mauve hue silty very fine-textured **sand** and sandy silt; ripples, cross-bedding in the sands; ice-rafted debris band including red and grey clay balls at 34.05 m; grey-brown mauve hue clayey silt rhythmites at 33.75 m; 35.15 m, 36.05 m, 36.5-36.55 m, 38.05 m, 38.35 m, 38.6 m, 38.7 m, 38.75 m, 39.85 m, 40.6 m, 41.75 m, 42.2 m, 42.8 m, 45.15 m, 46.0 m, 46.4 m, 46.5 m, 47.15 m, 49.0 m, 49.25 m, 49.45 m, 49.5 m, 49.6 m, 49.85 m, 50.25 m, 50.3 m, 50.35 m, 50.38 m, 50.43 m, 50.50 m, 50.55 m, 50.6 m, 50.65 m, 50.7 m, 50.75 m, 50.8 m, 50.85 m, 50.9 m, 50.95 m, 51.0 m, 51.3 m, 51.35 m, 51.4 m, 51.45 m, 51.5 m, 51.6 m, 51.65 m, 51.7 m, 51.78 m, 51.9 m, 52.25 m, 52.4 m, 52.5 m, 53.25 m, some highly deformed; parts of this unit are disturbed, perhaps dewatered; gradational lower contact. Sample at 34.2-34.25 m, 35.0-35.05 m, 36.8-36.85 m, 37.95-38.0 m, 40.5-40.55 m, 41.5-41.55 m, 42.5-42.55 m, 44.5-44.55 m, 45.9-45.95 m, 46.95-47.0 m, 49.4-49.45 m, 50.3-50.33 m, 51.15-51.2 m, 53.5-53.55 m.
55.75-57.25 m	Grey-brown with mauve hue silty fine-texture **sand**; ripples, cross-bedding and heavy mineral streaking; rip-up clay balls and grey clay granules; grey-brown to red-brown silty clay rhythmite at 56.9-57.05 m with silt stringers; gradational lower contact. Sample at 56.3-56.35 m.
57.25-59.3 m	Pale grey to grey-brown with mauve hue interbedded and interlaminated clayey **silt** and silty very fine-textured sand; gradational lower contact. Sample at 57.8-57.83 m.
59.3-59.75 m	Grey-brown with mauve hue silty very fine-textured **sand** with minor fine-textured sand; ~5% grits and granules; minor silt stringers; possible diamicton; sharp lower contact. Sample at 59.5-59.55 m.
59.75-61.75 m	Pale grey to blue-grey limestone **bedrock**; fossiliferous.

LP-MW-09-10

Location: 554675m E 4742247m N, NAD83, Zone 17
Screened Interval: 6.1-9.1 m, 22.5-25.5 m

Depth	Description
0.0-0.2 m	Black **topsoil**; disturbed lower contact.
0.5-0.8 m	Oxidized brown medium-coarse-textured **sand**, minor silt; gradational lower contact. Sample at 0.7-0.75 m.
0.8-2.25 m	Brown medium-coarse- to coarse-textured **sand**; occasional 1 cm rounded and polished limestone pebble; clean, loose; gradational lower contact. Sample at 1.5-2.25 m.
2.25-2.65 m	Oxidized brown silty medium-fine-textured **sand**; ~5% pea gravel, rounded to subrounded and polished; gradational lower contact. Sample at 2.4-2.45 m.
2.65-6.05 m	Brown medium-coarse-textured **sand**, minor silt; minor pea gravel, subrounded to rounded and polished; sharp but dipping lower contact. Sample at 2.75-3.25 m, 3.75-5.25 m, 5.75-5.8 m.
6.05-8.25 m	Brown medium-coarse- to medium-textured sand; minor heavy mineral concentration at 7.35 m; minor pea gravel; gradational lower contact. Sample at 6.25-6.3 m, 6.75-8.25 m.
8.25-10.0 m	Brown coarse- to medium-coarse-textured **sand**; brown clay balls at base; massive, minor silt; limestone cobble at 9.75 m, subrounded and polished; gradational lower contact. Sample at 8.25-9.0 m.
10.0-10.10 m	Grey-brown, clean, medium-coarse-textured **sand**; lower contact is sharp and horizontal. Sample at 10.05-10.10 m.
10.10-11.25 m	Grey silty very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; clay balls; ice-rafted debris; grey-brown to mauve silty clay rhythmites at 10.25-10.3 m, 10.45-10.47 m, 10.7-10.72 m; minor red clay rip-up clasts; gradational lower contact. Sample at 10.5-10.55 m.
11.25-12.75 m	Grey-brown silty **clay** and grey to mauve silty clay beds, 1-3 cm thick; some beds deformed; dark grey and red clay ball intraclasts; gradational lower contact. Sample at 11.75-11.8 m.
12.75-17.25 m	Pale grey silty very fine-textured **sand**; minor heavy mineral streaking; clay drop clasts and rip-up clasts; grey-brown to red-grey clayey silt to silty clay rhythmites, horizontal, some minor deformation, or dewatering structures at 12.75-12.8 m, 13.00-13.02 m, 13.1-13.12 m, 13.25-13.24 m, 13.5-13.55 m, 13.75-13.75.5 m, 13.95-13.97 m, 14.00-14.02 m, 14.05-14.07 m, 14.15-14.2 m, 14.2-14.25 m, 14.47-14.48 m, 14.6-14.64 m, 14.6-14.7 m, 14.85-14.89 m, 14.95-14.97 m, 15.0-15.25 m, 15.35-15.37 m, 15.49-15.5 m, 15.55-15.57 m, 15.6-15.62 m, 15.75-15.8 m, 16.0-16.05 m, 16.25-16.6 m, 16.35-16.36 m, 16.75-16.77 m, 16.85-16.86 m, 16.95-16.97 m; red rip-up clasts and ice-rafted debris at 16.25-16.27 m; gradational lower contact. Sample at 13.4-13.47 m, 14.75-14.8 m, 16.7-16.75 m.
17.25-17.4 m	Brown medium-coarse-textured **sand**; gradational lower contact. Sample at 17.35-17.4 m.
17.4-20.25 m	Pale grey silty very fine-textured **sand**, minor heavy mineral streaking; clay drop clasts and rip-up clasts; grey-brown to red-grey clayey silt to silty clay rhythmites at 17.75-17.77 m, 17.85-17.87 m, 18.2-18.25 m, 18.35-18.36 m, 18.38-18.39 m, 18.65-18.66 m,

	18.8-18.85 m, 19.0-19.03 m, 19.2-19.21 m, 19.25-19.27 m, 19.45-19.47 m, 19.6-19.65 m, 19.8-19.85 m, 20.03-20.05 m; gradational lower contact. Sample at 18.25-18.3 m, 19.94-19.98 m.
20.25-20.45 m	Grey silty very fine-textured **sand**; minor heavy mineral streaking; deformed lower contact.
20.45-20.6 m	Grey silty fine-textured **sand** to clayey silt; highly deformed; heavy mineral streaking; ripples and cross-bedding; gradational lower contact.
20.6-21.75 m	Grey silty fine-textured **sand**; ripples and cross-bedding; heavy mineral streaking; minor silt stringers; red clay laminae at 19.9-19.91 m; organic material observed between 21.0 and 21.75 m; sharp lower contact. Sample at 20.75-20.8 m.
21.75-21.77 m	Red silty **clay** and dark grey clay bed; rhythmite; sharp lower contact.
21.77-21.9 m	Grey **silt** and silty very fine-textured sand; minor clay balls and drop clasts; gradational lower contact.
21.9-24.0 m	Grey-brown minor mauve hue fine- to very fine-textured **sand**; minor silt stringers; grey clay drop granules; some deformation; organic material observed between 21.9 and 23.25 m; gradational lower contact. Sample at 21.9-22.55 m.
24.0-35.25 m	Brown to grey-brown medium-fine- to fine-textured **sand**; ripples and cross-bedding; grey-brown with mauve hue silt to clayey silt rhythmite at 24.55-24.6 m, 26.5-26.52 m, 27.85-27.87 m; coarsens to medium- and medium-fine-textured sand at 30.75 m; at 32.55-32.65 m grey-brown silty very fine-textured sand, massive, with sharp upper and lower contacts; at 33.25-33.29 m grey-brown to red silty clay, deformed upper and lower contacts; at 33.8-33.82 m dark grey clay gradational lower contact; red clay grits at 34.15 m; red and grey clay balls; organic material observed between 24.0-24.55 m, 24.75-27.75 m, 29.25-35.25 m; gradational lower contact. Sample at 24.0-24.75 m, 24.75-26.25 m, 26.25-27.75 m, 27.75-29.25 m, 29.25-30.75 m, 30.75-32.25 m, 32.25-33.75 m, 33.75-35.25 m.
35.25-35.6 m	Pale grey silty fine- to very fine-textured **sand**; grey clay intraclasts; ripples, cross-bedding and heavy mineral streaking; sharp lower contact.
35.6-35.65 m	Dark grey silty very fine-textured **sand** to clayey silt; deformed beds; some grey clay ball intraclasts; sharp lower contact.
35.65-35.9 m	Grey silty fine- to very fine-textured **sand**; some ripples and cross-bedding; heavy mineral streaking; deformed grey clay bed at 35.75 m 1 cm thick; deformed lower contact.
35.9-35.95 m	Grey silty fine-textured **sand**; red and grey clay balls; heavy mineral concentrations, highly deformed; some grits and granules, ice-rafted debris; deformed lower contact.
35.95-36.00 m	Pale grey sandy **silt**; dark grey clay granules; deformed but sharp lower contact.
36.00-36.1 m	Grey, red and red-brown **clay** beds and laminae with some silt laminae; ice-rafted debris and rip-up clasts of underlying silty very fine-textured sand and silt; gradational lower contact.
36.1-36.35 m	Grey-brown clayey **silt**; ~5% grits and granules to pea and pebble gravel; silt stringers; clayey at base; debris flow; deformed lower contact. Sample at 36.2-36.25 m.
36.35-36.75 m	Pale grey-brown **silt**, silty very fine-textured sand and clayey silt; deformed; gradational lower contact.

36.75-37.00 m	Pale grey silty very fine-textured **sand** to sandy silt beds, many grits and granules; silt and minor clay stringers; bedding is highly deformed; faulted and dewatering structures; ice-rafted debris; debris flow; deformed but sharp lower contact.
37.0-37.25 m	Grey silty clay to clayey **silt**; silt stringers; grey clay ball intraclasts; some reddish clay sections; grits and granules; silt inclusion ~3 cm thick, deformed at 37.1-37.15 m; sharp and dipping lower contact.
37.25-37.45 m	Pale grey **silt**; much ice-rafted debris, grey clay intraclasts and minor limestone pebbles; minor red clay inclusions; minor heavy mineral streaking; deformed lower contact. Sample at 37.3-37.35 m.
37.45-37.5 m	Grey-brown clayey **silt** to silt; deformed beds; minor pea to 2 cm gravel; deformed lower contact.
37.5-39.97 m	Grey-brown with mauve hue clayey **silt**; minor grey clay balls and grits, granules, intraclasts; silt laminae; some reddish banding; gritty silt bed at 38.4 m; at 39.00 m granite pebble; fines to silty clay at 39.05 m; organic material observed between 37.75 and 39.25 m; sharp lower contact. Sample at 37.8-37.85, 39.25-39.3 m.
39.97-40.40 m	Grey-brown sandy silt **diamicton**; ~5-10% grits to pea gravel, limestone; gradational lower contact. Sample at 40.05-40.15 m.
40.40-40.75 m	Grey-brown with blue hue clayey **silt**, silt and silty clay; some horizontal beds of grits and granules; minor red grits; dewatering structures, deformation; gradational lower contact. Sample at 40.5-40.55 m.
40.75-42.75 m	Grey to white limestone **bedrock**; some chert inclusions; surface appears to be solution weathered.

LP-MW-10-10

Location: 549878m E 4750746m N, NAD83, Zone 17
Screened Interval: 3.0-6.1 m

Depth	Description
0.0-0.25 m	Black **topsoil**; sharp lower contact.
0.25-5.15 m	Grey-brown medium-textured **sand**, minor silt; oxidized sections; some deformation; minor heavy mineral streaking at 4.3-4.5 m; sharp but deformed lower contact. Sample at 0.65-0.85 m, 1.5-3.0 m, 3.0-4.5 m.
5.15-12.0 m	Grey silty very fine-textured sand to sandy silt; laminae and thin beds 1-2 cm thick; grey-brown clayey silt rhythmites at 6.35 m, 6.75 m, 6.95 m, 7.2 m, 7.6 m, 7.75 m, 8.55 m, 10.85 m, 11.3-11.4 m, 11.6 m, 11.7 m; many clayey silt laminae between 9.25-9.75 m; rip-up clasts, red shale granules; ice-rafted debris, minor clay inclusions within the sands; gradational lower contact. Sample at 5.3-5.75 m, 6.5-6.55 m, 7.95-8.0 m, 10.15-10.2 m, 11.0-11.05 m.
12.0-12.3 m	Dark grey to pale grey clayey **silt** with silt laminae; minor grits and granules; deformed and faulted laminae; dewatering structures; sharp lower contact.
12.3-15.0 m	Pale grey sandy silt **diamicton**; compact; ~5% grits to 4 cm pebbles, limestone, subangular to subrounded; gradational lower contact. Sample at 12.45-12.5 m, 14.0-14.05 m.
15.0-15.3 m	Grey-brown medium-textured **sand** interbedded with grey clayey silt; minor clay balls and grits; sharp but deformed lower contact.
15.3-15.55 m	Pale grey-brown medium-textured **sand** with clayey silt; ~5% pea to pebble gravel; subangular to subrounded, limestone; sharp lower contact. Sample at 15.45-15.5 m.
15.55-17.00 m	Grey-brown with mauve hue sandy **silt**; minor grits, minor silt stringers; gradational lower contact.
17.00-17.25 m	Grey-brown sandy **silt** to silty sand; silt stringers; sharp lower contact. Sample at 17.05-17.1 m.
17.25-18.0 m	Pale grey silty very fine-textured **sand**, silt laminae; laminae are deformed; gradational lower contact.
18.0-19.2 m	Grey fine- to very fine-textured **sand** with minor silt; heavy mineral streaking, ripples and cross-bedding; some deformed sections; organic material observed between 18.0 and 19.2 m; sharp but deformed and faulted lower contact. Sample at 18.25-18.5 m.
19.2-19.5 m	Red-brown to dark grey laminated clayey **silt** and very fine-textured sand; dewatering structures; organic material observed between 19.2 and 19.5 m; faulted but sharp lower contact.
19.5-21.0 m	Grey silty very fine-textured **sand**; minor heavy mineral streaking; grey-brown to mauve hue clayey silt rhythmites at 19.75 m (highly deformed), 20.05 m, 20.5-20.6 m, 20.75-21.0 m; silt stringers and minor clay rip-up clasts; gradational lower contact. Sample at 20.0-20.25 m.
21.00-22.5 m	Grey-brown clayey **silt** to silty clay, pale grey silty very fine-textured sand, and red-brown clayey silt; laminae; deformed sections, ice-rafted debris and rip-up clasts; some sandy sections are highly deformed and show dewatering structures; 5 cm limestone pebble at

	21.25 m; some red clay beds and laminae; gradational lower contact. Sample at 21.48-21.53 m.
22.5-24.20 m	Grey-brown silty very fine-textured **sand**; ripples, cross-bedding, heavy mineral streaking; clayey silt rhythmites at 22.5 m, 22.7 m, 22.75 m, 22.8 m, 23.15 m, 23.5 m, 23.75-23.85 m; between 23.5-23.85 m red shale and clay rip-up clasts, intraclasts; dark grey limestone pebble 1-3 cm at 23.8 m; folded and faulted sections; some dewatering structures; minor ice-rafted debris; gradational lower contact. Sample at 23.3-23.35 m.
24.2-24.75 m	Pale grey to tan sandy silt **diamicton**; compact; ~5% grits to cobbles, limestone; gradational lower contact. Sample at 24.45-24.5 m.
24.75-25.5 m	Limestone pebbles to cobble **gravel**; striated; subangular to angular; gradational lower contact.
25.5-26.25 m	Pale grey-brown **cobbles** with sandy silt to silty sand matrix; clasts are limestone; grits and granules; gradational lower contact.
26.25-27.0 m	Grey-brown with mauve hue compact silty sandy **diamicton**; ~5% grits and granules; gradational lower contact. Sample at 26.25-26.3 m.
27.0-27.5 m	Grey-brown with mauve hue, silty sand to sandy silt **diamicton**; softer than above; ~5% grits to 2 cm subangular limestone; some massive section; some red shale grits; sharp lower contact.
27.5-27.85 m	Grey-brown clayey **silt**, sandy silt laminae; folding, faulting; dewatering structures; sharp lower contact.
27.85-28.25 m	Interbedded dark grey clayey **silt** and pale grey silty very fine-textured sand; deformed, folded, faulted; some red sections; gradational lower contact.
28.25-28.5 m	Grey-brown with mauve hue, silty sand to sandy silt **diamicton**; softer than above; ~5% grits to 2 cm subangular limestone; some massive sections; some red shale grits; sharp lower contact. Sample at 28.25-28.3 m.
28.5-28.9 m	Grey to pale grey to red-brown irregular beds and laminae of clayey **silt**, silt and silty very fine-textured sand; faulted beds; minor grits and granules; silt stringers; red shale and clay rip-up clasts; sharp lower contact.
28.9-29.0 m	Pale grey silty very fine-textured **sand** minor grey-brown clayey silt laminae; faulted; sharp lower contact. Sample at 28.95-29 m.
29.0-29.2 m	Pale grey sandy silt **diamicton**; compact; ~5% grits to 4 cm pebbles, limestone; gradational lower contact.
29.2-29.7 m	Pale grey sandy **silt**; minor grits to 1 cm pebbles, limestone; grey clayey silt laminae; minor red shale intraclasts; deformed and dewatering structures present; silt caps on clasts; sharp lower contact.
29.7-29.85 m	Pale grey horizontally laminated sandy **silt** and silt; rare grits and granules; sharp lower contact.
29.85-30.00 m	Dark grey clayey **silt**; silt stringers; deformed; gradational lower contact.
30.00-31.5 m	Grey-brown with mauve hue to pale grey clayey **silt** to silty very fine-textured sand; irregular beds and laminae; silt stringers; deformed sections; rip-up clasts; beds of ice-rafted debris at 30.95 m; some massive sections; gradational lower contact. Sample at 30.75-30.79 m.

31.5-33.0 m	Grey-brown with mauve hue clayey **silt**; pale grey silt stringers; compact; many grits and granules, ice-rafted debris; red shale and clay grits to 1 cm; debris rich beds at 32.05-32.2 m, possible debris flow; some deformation; some massive sections; silty very fine sand at 32.65-32.7 m; gradational lower contact. Sample at 32.05-32.1 m.
33.0-35.05 m	Pale grey, moderately compact to loose sandy silt **diamicton**; ~5-10% pea to cobble gravel, subangular to subrounded limestone; becomes more compact at 34.5 m; possibly Port Stanley Till; sharp lower contact. Sample at 33.75-33.8 m, 35.0-35.05 m.
35.05-36.7 m	Pale grey to pale blue-grey limestone **bedrock**; fossiliferous, black seams.

LP-MW-11-10

Location: 549840m E 4741097m N, NAD83, Zone 17
Screened Interval: 5.2-8.2 m, 16.8-18.3 m

Depth	Description
0.0-1.0 m	Oxidized brown medium-textured **sand** interbedded with black topsoil; disturbed soil horizons; gradational lower contact. Sample at 0.5-0.55 m.
1.05-3.0 m	Oxidized brown medium-textured **sand**; some deformed soil horizons; silty section at 2.5 m; gradational lower contact. Sample at 1.0-1.25 m, 2.6-2.75 m.
3.0-18.00 m	Brown medium-textured **sand**; horizontal heavy mineral laminae; minor oxidized sections; minor deformed ripples and cross-bedding; red-brown to dark grey clayey silt to silty clay balls at 10.75-10.85 m; grey-brown mauve hue sandy silt beds at 12.5-12.55 m and 12.8-12.85 m; at 14.05 m grey with mauve hue silty sand bed; gradational lower contact. Sample at 3.0-4.5 m, 4.5-6.0 m, 6.0-7.5 m, 7.5-9.0 m, 9.0-10.5 m, 10.5-12.0 m, 12.65-12.75 m, 13.75-13.8 m, 16.0-16.05 m, 17.0-17.25 m.
18.0-24.00 m	Pale grey to red-brown to dark grey silty very fine-textured **sand** laminated with silt, and minor fine-textured sand; dewatering structures, folding, faulting; grey to red-brown clayey silt rhythmites at 18.15 m, 18.3 m, 19.0 m, 19.5 m, 20.45 m, 21.1 m, 21.25 m, 21.65 m, 22.0 m, 22.4 m, 22.55 m, 23.15 m, 23.5 m; gradational lower contact. Sample at 18.5-18.55 m, 19.7-19.75 m, 21.4-21.45 m, 23.25-23.3 m.
24.00-30.0 m	Grey-brown clayey **silt**, irregularly interbedded and laminated with pale grey silt and red-brown silty clay; structures are deformed, folded, faulted; dewatering structures; minor red shale grits; gradational lower contact. Sample at 25.4-25.45 m, 25.75-25.8 m, 27.5-27.55 m, 29.05-29.1 m.
30.0-31.5 m	Pale grey to red-brown to dark grey silty very fine-textured **sand** laminated with silt, and minor fine-textured sand; dewatering structures, folding, faulting; gradational lower contact. Sample at 31.15-31.2 m.
31.5-33.0 m	Pale grey-brown silty very fine-textured **sand**; some silty clay, and clay; minor grits and granules; between 32.0 and 32.4 m sediment is highly deformed; brown clayey silt at 32.00-32.55 m; gradational lower contact. Sample at 32.6-32.65 m.
33.0-34.5 m	Grey-brown silty very fine-textured **sand**, minor silt, clayey silt and medium-textured sand; deformed ripples and cross-bedding; heavy mineral streaking; brown clayey silt rhythmites at 33.5 m, 33.9 m, 34.15 m; gradational lower contact. Sample at 33.45-33.5 m.
34.5-36.00 m	Grey-brown irregular beds and laminae of sandy **silt**, silty clay and silty very fine-textured sand, minor medium-textured sand; minor grits and granules; highly deformed; dewatering structures; pale grey to dark grey to mauve grey clayey silt rhythmites at 34.8 m, 34.95 m, 35.35 m, 35.55 m, 35.65 m, 35.85 m; gradational lower contact. Sample at 34.97-35.00 m.
36.00-37.5 m	Pale grey silty very fine-textured **sand**; minor silt laminae; minor bedding; deformation; dark grey clayey silt rhythmites at 36.1 m, 36.3 m; gradational lower contact. Sample at 36.2-36.25 m.
37.5-46.75 m	Pale grey silty fine-textured **sand**; minor silt laminae; minor bedding; some highly deformed sections; grey-brown clayey silt rhythmites at 37.9 m, and 38.10 m; 39.0 m, 39.9 m, 41.05 m, 42.05 m, 42.45 m, 43.15 m, 45.25 m, 46.3 m; ripples and cross-bedding

in silty fine-textured sand; some mauve hue sections; minor heavy mineral streaking; ice-rafted debris beds at 43.6 m; red clay ball at 43.55 m; grey fine-textured sand bed at 45.75-46.0 m; sharp lower contact. Sample at 37.7-37.75 m, 39.25-39.3 m, 39.5-40.0 m, 42.2-42.25 m, 44.0-44.05 m, 46.15-46.2 m.

46.75-61.5 m — Massive grey-brown mauve hue sandy **silt**; dark grey-brown clayey silt rhythmites at 47.1 m, 47.3 m, 47.5 m, 48.4 m, 48.8 m, 49.0 m, 49.25 m, 49.8 m, 50.0 m, 50.4 m, 51.7 m, 52.1 m, 52.35 m, 52.7 m, 53.35 m, 53.7 m, 54.4 m, 54.9 m, 55.2 m, 55.85 m, 56.35 m, 56.55 m, 56.7 m, 56.85 m, 57.25 m, 57.4 m, 57.5 m, 57.6 m, 57.8 m, 58.05 m, 58.2 m, 58.25 m, 58.3 m, 58.45 m, 58.5 m, 58.65 m, 58.75 m, 58.85 m, 59.0 m, 59.05 m, 59.2 m, 59.25 m, 59.35 m, 59.4 m, 59.5 m, 59.6 m, 59.7 m, 59.75 m, 59.9 m, 60.03 m, 30.15 m, 60.3 m, 60.4 m, 60.6 m, 60.9 m, 60.10 m, 61.25 m, 61.45 m; gradational lower contact. Sample at 46.95-47.0 m, 48.2-48.25 m, 50.2-50.25 m, 51.95-52.0 m, 53.75-53.8 m, 54.7-54.75 m, 56.2-56.25 m, 57.95-58.0 m, 58.85-58.8 m, 60.75-60.8 m.

61.5-63.10 m — Grey-brown with mauve hue clayey **silt**; pale grey silt laminae and beds; silty very fine-textured sand laminae; ice-rafted debris at 62.35 m; sharp lower contact. Sample at 62.5-62.55 m.

63.1-63.35 m — Tan with mauve hue silty sandy **diamicton**; ~5% grits to 3 cm pebbles, angular to subrounded, limestone; sharp lower contact. Sample at 63.3-63.35 m.

63.35-65.1 m — Pale grey-blue limestone **bedrock**; fossiliferous, black bituminous seams.

LP-MW-12-10

Location: 552051m E 4753995m N, NAD83, Zone 17
Screened Interval: 4.6-7.6 m

Depth	Description
0.0-0.25 m	Brown **topsoil**; sharp lower contact.
0.25-0.8 m	Oxidized brown medium-textured **sand**; sharp horizontal lower contact.
0.8-1.5 m	Brown medium-textured **sand**, minor silt; gradational lower contact. Sample at 0.85-0.9 m, 1.2-1.35 m.
1.5-5.6 m	Brown medium- to coarse-textured **sand**; very minor heavy mineral streaking; minor granule gravel, limestone pebbles 1-2 cm, rounded and polished; dipping but sharp lower contact. Sample at 1.5-3.0 m, 3.0-4.5 m, 4.75-5.0 m.
5.6-6.0 m	Grey with mauve hue sandy **silt** to silty very fine-textured sand; minor silty fine-textured sand; minor ripples, cross-bedding, and heavy mineral streaking; organic material observed; gradational lower contact.
6.0-8.2 m	Pale grey silty fine- to medium-fine-textured **sand**; ripples cross-bedding and heavy mineral streaking; organic material observed; gradational lower contact. Sample at 6.0-7.5 m, 7.75-8.0 m.
8.2-8.3 m	Pale grey silty very fine-textured **sand** and sandy silt to clayey silt; heavy mineral streaking; organic material observed; sharp but deformed lower contact.
8.3-8.45 m	Red-brown to grey-brown clayey **silt**; sharp lower contact.
8.45-9.0 m	Pale grey silty very fine-textured **sand** and sandy silt to clayey silt; heavy mineral streaking; organic material observed; sharp but deformed lower contact.
9.0-13.5 m	Pale grey silty fine- to very fine-textured **sand**; minor laminae, ripples cross-bedding and heavy mineral streaking; grey-brown to red-brown clayey silt, highly deformed at 9.4-9.7 m; red-brown clayey silt rhythmites at 10.5-10.5 m, 12.35-12.4 m; organic material observed at 9.0-10.5 m; gradational lower contact. Sample at 9.95-10.0 m, 10.75-12.0 m, 12.0-13.5 m.
13.5-15.0 m	Grey-brown fine- to very fine-textured **sand**; deformed ripples, cross-bedding and heavy mineral streaking; organic material observed; gradational lower contact. Sample at 13.5-15.0 m.
15.0-18.0 m	Grey-brown silty fine- to very fine-textured **sand**; deformed ripples, cross-bedding and heavy mineral streaking; grey-brown to red-brown clayey silt rhythmites at 15.75-15.8 m, 16.17-16.2 m, 16.45-16.5 m, 16.5-16.53 m, 17.15-17.2 m, 17.75-17.8 m, gradational lower contact. Sample at 15.5-15.6 m, 17.5-17.55 m.
18.0-20.0 m	Variable beds of red-brown to grey-brown clayey **silt** to silty clay and grey-brown to pale brown silty very fine- to fine-textured sand; laminae and silt stringers; some deformation; red shale drop clasts; ice-rafted debris; some grey clay intraclasts; draping beds; minor grits and granules; sharp lower contact. Sample at 18.35-18.38 m.
20.0-23.1 m	Pale grey silty very fine- to fine-textured **sand**; minor ripples cross-bedding and heavy mineral streaking; minor ice-rafted debris; red-brown to dark grey clayey silt rhythmites at 20.1-20.15 m, 20.3-20.32 m, 20.4-20.41 m, 20.7-20.73 m, 21.1-21.11 m, 21.25-21.26 m,

	21.35-21.36 m, 21.55-21.57 m, 21.75-21.77 m, 22.2-22.25 m; organic material observed at 21.0-22.5 m; sharp but deformed lower contact. Sample at 20.2-20.25 m, 21.45-21.5 m, 22.8-22.85 m.
23.1-24.0 m	Grey-brown with mauve hue clayey **silt**; many silt stringers at 23.45-24.0 m; many red shale ice-rafted debris; grey clay and shale clasts; silt stringers are deformed; gradational lower contact. Sample at 23.6-23.65 m.
24.0-24.25 m	Grey-brown with mauve hue to pale grey silty very fine-textured **sand** and sandy silt; clayey silt laminae, deformed; grits and granules; minor medium-textured sand; sharp lower contact.
24.25-27.0 m	Pea to cobble **gravel**, with silty fine- to medium-textured sand matrix; subangular to subrounded limestone clasts dominate; loose; matrix washed out at 25.5 m; several cobbles larger than core tube; sharp lower contact. Sample at 24.85-24.9 m, 25.75-25.8 m.
27.0-30.95 m	Pale grey compact silty sandy **diamicton**; 5-10% pea to cobble gravel, mainly limestone, subangular to subrounded, polished and striated; loose between 27 and 28.5 m and more compact between 28.5 and 30.95 m; sharp lower contact. Sample at 27.25-27.3 m, 29.0-29.05 m, 30.45-30.5 m.
30.95-31.85 m	Dark grey-brown with mauve hue clayey silt to silty clay **diamicton**; very compact; much ice-rafted debris; faulted and deformed debris bands; variation in sediment colour; low clast content, very minor pea to pebble and larger clasts; silt bands; overconsolidated; becomes very gritty and granular at 31.75 m. Sample at 31.05-31.1 m, 31.7-31.75 m.
31.85-32.27 m	Fractured limestone bedrock interbedded with silty sand, minor grit; **diamicton**; medium-textured sand; less compact than above.
32.27-33.0 m	Pale grey-blue limestone **bedrock**; fossiliferous, chert; bedrock surface is fractured.

LP-MW-13-10

Location: 550111m E 4744331m N, NAD83, Zone 17
Screened Interval: 4.6-7.6 m, 19.8-21.3 m

Depth	Description
0.0-0.25 m	Black **topsoil**; sharp lower contact.
0.25-1.75 m	Upper 1 cm is dark orange bed of medium-coarse- to medium-textured **sand**; remainder is brown, slightly oxidized medium-textured sand; minor heavy mineral streaking; gradational lower contact. Sample at 0.65-1.05 m, 1.3-1.7 m.
1.75-9.5 m	Brown medium-textured **sand**; oxidized between 2.95-3.15 m; minor clay balls <1 cm in diameter; minor heavy mineral streaking; rare limestone pebbles; fines to medium-fine-textured sand at 9.1 m; some deformed blocks of horizontal heavy mineral streaking, ripples and cross-bedding; gradational lower contact. Sample at 2.0-3.5 m, 3.5-5.0 m, 5.0-6.5 m, 6.5-8.0 m, 8.0-9.5 m.
9.5-13.2 m	Brown to grey-brown medium-fine- to medium-textured **sand**; some deformed ripples and cross-bedding; heavy mineral streaking in sections; organic material observed at 11.0-12.5 m; sharp lower contact. Sample at 9.5-11.0 m, 11.0-12.5 m, 12.6-13.0 m.
13.2-14.0 m	Brown fine-textured **sand**; some heavy mineral streaking; some medium-coarse-textured sand; silt beds subvertical at base of this section; some silty clay stringers; deformed; gradational lower contact.
14.0-14.75 m	Pale grey-brown very fine-textured **sand**, minor silt; ripples, cross-bedding, heavy mineral streaking; minor grey clay granules; gradational lower contact.
14.75-15.25 m	Grey-brown silty very fine-textured **sand**; heavy mineral bedding; minor red clay granule inclusions; red-brown clay laminae at 15.2 m; gradational lower contact. Sample at 15.05-15.10 m.
15.25-15.5 m	Grey-brown very fine-textured **sand**; heavy mineral streaking; gradational lower contact.
15.5-17.5 m	Grey-brown interbeds of silty very fine-textured **sand** and medium-fine-textured sand; medium-fine-textured sand has ripples, cross-bedding and heavy mineral streaking; silty very fine-textured sand is massive; sharp contacts between beds; minor grits and granules, ice-rafted debris; at 16.75-16.8 m beds of reddish-grey clay 0.5-1.0 cm thick interbedded with silty very fine-textured sand; gradational lower contact. Sample at 15.75-15.8 m, 16.5-16.55 m.
17.5-18.5 m	Brown fine-textured **sand**, minor silt; heavy mineral streaking; dewatering structures, deformation; minor silt laminae; gradational lower contact. Sample at 17.5-18.3 m.
18.5-20.0 m	Grey-brown fine- to very fine-textured **sand**; some ripples, cross-bedding and heavy mineral streaking; grey and red-brown clay laminae at 18.7 m; sections are highly deformed; dewatering structures; gradational lower contact. Sample at 19.5-19.55 m.
20.0-21.5 m	Brown fine- to very fine-textured **sand**, minor silt; ripples, cross-bedding and heavy mineral streaking; organic material observed; gradational lower contact. Sample at 20.0-21.5 m.
21.5-23.0 m	Brown to grey-brown with mauve hue silty very fine-textured **sand** to sandy silt; deformed clayey silt laminae at 21.75-21.85 m; silty clay bed at 22.5 m; red clay intraclasts; ripples,

	cross-bedding, heavy mineral streaking; silt stringers; gradational lower contact. Sample at 22.25-22.3 m.
23.0-29.0 m	Grey-brown with mauve hue silty very fine-textured **sand** to sandy silt; silty very fine-textured sand has ripples cross-bedding, heavy mineral streaking, beds are deformed in places; some red and dark grey clay balls; minor grits and granules; red-brown to dark brown clay rhythmite at 23.75-23.8 m, 25.2-25.21 m, 25.4-25.43 m, 25.65-25.68 m, 26.0-26.03 m, 26.7-26.68 m, 27.2-27.23 m, 27.55-27.58 m deformed; 27.75-27.76 m, 28.25-28.26 m, 28.65-28.66 m; gradational lower contact. Sample at 23.3-23.35 m, 25.05-25.1 m, 27.0-27.05 m, 28.0-28.05 m.
29.0-30.65 m	Grey-brown with mauve hue silty very fine-textured **sand**; ripples, cross-bedding heavy mineral streaking; minor grits and granules; minor grey clay intraclasts; some red shale and clay intraclasts; grey and red-brown clay rhythmites at 29.5-29.51 m, and 29.8-29.81 m; sands are deformed in sections; gradational lower contact. Sample at 30.0-30.05 m.
30.65-31.15 m	Grey-brown with mauve hue silt and silty very fine-textured **sand**; red-brown to grey clay rhythmites at 30.75-30.77 m, 31.1-31.11 m; grey clay balls; some red grits, granules; sharp lower contact.
31.15-35.0 m	Grey-brown with slight mauve hue silty fine-textured **sand**; ripples, cross-bedding, heavy mineral streaking; minor clay inclusions; grey to grey-mauve clay rhythmites at 32.05-32.07 deformed, 33.0-33.03 m, 33.6 m, 33.7-33.75 m, 33.8-33.85 m; fines to silty very fine-textured-sand and silt at 33.0-33.5 m; gradational lower contact. Sample at 31.25-31.3 m, 32.5-32.55 m, 34.0-34.05 m.
35.0-36.5 m	Grey-brown with mauve hue silty fine-textured **sand**; ripples and cross-bedding, heavy mineral streaking; some clay balls, red and grey, ~1 cm diameter; very minor grits and granules; gradational lower contact. Sample at 35.0-36.5 m.
36.5-47.0 m	Grey-brown with mauve hue silty very fine-textured **sand** to silty fine-textured sand; ripples, cross-bedding, heavy mineral streaking; minor clay ball intraclasts, dropstones; some red shale, clay intraclasts; red-brown to dark grey clay underlain by silt rhythmites at 36.5-36.53 m, 37.0-37.05 m, 39.0-39.02 m, 39.35-39.37 m, 39.9-39.95 m, 40.25-40.27 m, 41.15-41.2 m, 41.23-41.25 m, 41.65-41.66 m, 41.75-41.77 m, 42.1-42.12 m, 42.35-42.45 m, 42.7-42.75 m, 43.15-43.17 m, 43.26-43.27 m, 43.4-43.42 m, 43.45-43.5 m, 43.6-43.63 m, 43.75-44.0 m, 44.0-44.2 m, 44.4-44.42 m, 44.5-44.53 m, 44.53-44.57 m, 44.7-44.74 m, 44.75-44.77 m, 44.8-44.82 m, 44.9-44.92 m, 44.95-44.97 m, 45.0-45.05 m, 45.1-45.15 m, 45.17-45.19 m, 45.25-45.28 m, 45.3-45.32 m, 45.35-45.4 m, 45.75-45.79 m, 46.0-46.03 m, 46.25-46.27 m, 46.7-46.71 m; some deformation; fines to silty very fine-textured sand at 39.5 m; fines to grey-brown sandy silt at 44.0 m; organic material observed at 38.0-39.5 m; gradational lower contact. Sample at 37.25-37.3 m, 38.0-39.5 m, 40.5-40.55 m, 42.0-42.05 m, 42.72-42.75 m, 45.05-45.6 m, 46.5-46.55 m.
47.0-48.25 m	Grey-brown with mauve hue silty **clay**; mostly massive, minor silt stringers, grits, granules; between 47.05-47.35 m and 47.4-47.45 m grey-brown silty very fine-textured sand to sandy silt; clay stringers, grits and granules, clay granules, grey and red clay balls; gradational lower contact. Sample at 48.0-48.05 m.
48.25-53.0 m	Grey-brown to mauve hue clayey silt; minor silt stringers; minor grits and granules; bed of ice-rafted debris at 48.75 m; at 52.15-52.23 m pebble gravel, silty clay and minor sand; limestone, subrounded to rounded and polished; sharp lower contact. Sample at 49.75-49.8 m, 50.75-50.8 m, 52.5-52.55 m.
53.0-54.5 m	Pale grey to white limestone **bedrock**; between 53.0 and 53.25 m stone is fractured.

LP-MW-14-10

Location: 547451m E 4743322m N, NAD83, Zone 17
Screened Interval: 3.0-6.1 m, 17.7-19.2 m

Depth	Description
0.0-0.25 m	Black **topsoil** with pea to pebble gravel; sharp horizontal lower contact.
0.25-0.95 m	Oxidized brown to brown medium- to medium-coarse-textured **sand**, minor silt; some heavy mineral banding; horizontal bedding; gradational lower contact. Sample at 0.5-0.95 m.
0.95-1.35 m	Brown medium- to medium-fine-textured **sand**; minor silt; heavy mineral streaking; some oxidized sections sharp and dipping lower contact.
1.35-1.5 m	Brown medium-textured **sand**, oxidized under the overlying soil horizon, at 1.5 m remnant of black topsoil; gradational lower contact.
1.5-2.0 m	Grey-brown mildly blue-green sandy **silt**; minor silt stringers; rare pea gravel; gradational lower contact. Sample at 1.7-1.75 m.
2.0-2.45 m	Mildly oxidized brown sandy **silt**; medium-coarse-textured sand beds, deformed; minor grits and granules; deformed but sharp lower contact. Sample at 2.15-2.2 m.
2.45-3.5 m	Brown medium-fine-textured **sand**, minor silt; ripples, cross-bedding, heavy mineral streaking; occasional pea gravel; gradational lower contact. Sample at 2.7-3.25 m.
3.5-6.5 m	Brown medium- to medium-textured **sand**; minor heavy mineral streaking; rare pea gravel clasts, subrounded, limestone; gradational lower contact. Sample at 3.5-5.0 m, 5.5-6.5 m.
6.5-8.0 m	Massive brown medium-coarse- to coarse-textured **sand**; gradational lower contact. Sample at 6.5-8.0 m.
8.0-8.55 m	Brown medium-fine-textured **sand**; heavy mineral streaking; highly deformed; dewatering structures; sharp lower contact.
8.55-8.95 m	Grey-brown silty very fine-textured **sand** to sandy silt; at 8.7-8.72 m grey clay; silt laminae at base of this unit; sharp lower contact. Sample at 8.75-8.8 m.
8.95-9.5 m	Brown medium-fine- to fine-textured **sand**; heavy mineral banding, deformed; gradational lower contact. Sample at 9.2-9.25 m.
9.5-15.3 m	Brown medium-textured **sand**; some heavy mineral streaking, deformed, otherwise massive; sharp lower contact. Sample at 9.5-11.0 m, 11.0-12.5 m, 12.5-14.0 m, 14.0-15.3 m.
15.3-20.0 m	Brown coarse-textured **sand**, minor pea gravel, subrounded to rounded and polished, limestone; at 16.6 m medium-coarse-textured sand to medium-textured sand bed, sharp upper and lower contacts; gradational lower contact. Sample at 15.5-17.0 m, 18.2-18.25 m, 18.7-18.75 m.
20.0-28.6 m	Pale grey sandy **silt**; dark grey 1 cm thick clay bed at 20.75 m; some silty very fine-textured sand in sections; minor heavy mineral streaking; some clay grits and ice-rafted debris at 20.7 m; coarsens to silty very fine-textured sand; gradational lower contact.

	Sample at 20.5-20.55 m, 22.5-22.55 m, 23.3-23.35 m, 25.25-25.3 m, 27.8-27.85 m, 28.25-28.3 m.
28.6-29.6 m	Grey-brown with mauve hue silty **clay** beds and silt laminae; deformed; gradational lower contact.
29.6-30.5 m	Grey to grey-brown to red-brown silty **clay** to silt beds, laminae and stringers; deformed; clay intraclasts, drop clasts and ice-rafted debris; gradational lower contact. Sample at 29.97-30.02 m.
30.5-32.0 m	Grey-brown silty very fine-textured **sand** with grey-brown to red-brown clay beds and laminae; clayey silt rhythmites at 30.6-30.65 m, and 31.03 m; drop clasts, ice-rafted debris, grits and granules; gradational lower contact. Sample at 31.0-31.05 m.
32.0-35.0 m	Grey-brown to dark grey to red-brown clayey **silt**, silty clay and minor silty very fine-textured sand; beds, laminae and stringers; some deformation; red and grey ice-rafted debris, clay intraclasts; minor grits; gradational lower contact. Sample at 32.45-32.5 m, 34.5-34.55 m.
35.0-35.85 m	Grey-brown to dark grey to red-brown silty **clay**, clayey silt and minor silt; silty clay rhythmites at 35.35-35.4 m, 35.45-35.47 m, 35.5-35.6 m, 35.75-35.77 m; sharp lower contact. Sample at 35.55-35.6 m.
35.85-36.00 m	Pale grey silt to sandy **silt**, minor clay stringers; bedding deformed; red shale, black and grey grits and granules, ice-rafted debris at 39.96-39.99 m; sharp lower contact.
36.00-37.05 m	Pale brown fine- to very fine-textured **sand**; some ripples, cross-bedding, heavy mineral streaking; minor clay ball intraclasts; organic material observed; sharp lower contact. Sample at 36.0-36.40 m, 36.75-36.8 m.
37.05-37.35 m	Grey to dark grey silty very fine-textured **sand**, silty clay and clayey silt; grits and granules, ice-rafted debris; weathered crystalline pebbles at 37.35 m; some reddish clay sections; some deformation of clayey silt beds and laminae; sharp lower contact.
37.35-42.5 m	Grey-brown medium- to medium-coarse-textured **sand**; minor bedding, dipping; minor silt stringers; minor grits and granules; gradational lower contact. Sample at 37.45-38.0 m, 38.0-39.5 m, 39.5-41.0 m, 41.0-41.5 m.
42.5-43.5 m	Brown medium-coarse-textured **sand**; minor clay balls; sharp lower contact. Sample at 42.75-43.0 m, 43.4-43.5 m.
43.5-44.0 m	Grey-brown with mauve hue silty very fine-textured **sand** to silt; some grey clay inclusions; minor red shale grits; minor silt stringers; minor heavy mineral streaking; gradational lower contact.
44.0-44.25 m	Pale grey silty very fine-textured **sand**; heavy mineral streaking; red and grey clay balls; sharp lower contact.
44.25-44.6 m	Grey-brown with mauve hue clayey **silt**; silt stringers; grey clay grits; minor pea gravel; deformed; sharp lower contact.
44.6-44.9 m	Grey-brown sandy **silt**; minor silt stringers; massive silt bed at 44.8 m; grits, granules up to 1 cm, limestone; red clay balls; sharp lower contact. Sample at 44.75-44.8 m.
44.9-45.25 m	Grey-brown with mauve hue silty **clay**; some horizontal banding; ~5% grits and granules; minor rip-up and drop clasts; bottom 0.5 cm silt laminae; gradational lower contact. Sample at 45.15-45.2 m.
45.25-45.95 m	Grey-brown with mauve hue clayey **silt**; ~5-10% grits to granule to pea gravel; silt stringers; clay balls; otherwise massive gradational lower contact. Sample at 45.5-45.6 m.

45.95-46.25 m	Grey-brown with mauve hue clayey **silt**, fining to silty clay; silt stringers; very minor grits and granules; sharp lower contact.
46.25-47.3 m	Grey-brown silty very fine-textured **sand,** coarsening to medium- and medium-coarse-textured sand; heavy mineral streaking; ripples and cross-bedding; very minor grits granules; at 47.0 m 1-2 cm clay ball inclusions; deformed lower contact. Sample at 46.5-46.9 m.
47.3-47.5 m	Grey-brown with mauve hue sandy **silt**; grits and granules; silt stringers; sharp lower contact. Sample at 47.45-47.5 m.
47.5-48.5 m	Pale grey-brown silty very fine- to fine-textured **sand**; silt beds and stringers; minor clay; coarsening to very fine-textured sand with minor heavy mineral streaking and rare grits and granules; gradational lower contact. Sample at 48.0-48.05 m.
48.5-48.7 m	Grey-brown with mauve hue clayey **silt**, silty clay to silt; clay laminae; silt stringers; faulted beds; sharp lower contact.
48.7-48.75 m	Grey-brown with mauve hue sandy silt **diamicton**; ~5% grits and granules; sharp lower contact.
48.75-49.15 m	Pale grey-brown with mauve hue silty very fine-textured **sand** fining to sandy silt; some horizontal but faulted strata; laminae up to 1 cm; very minor clay stringers; sharp lower contact. Sample at 49.0-49.05 m.
49.15-49.2 m	Grey-brown with mauve hue silty very fine-textured **sand** fining to sandy silt; massive; gradational lower contact.
49.2-49.4 m	Grey-brown with mauve hue sandy silt **diamicton**; ~5-10% grits and granules; massive till; becomes very stony at 49.4-49.45 m, pebbles subangular with some subrounded, limestone; sharp lower contact. Sample at 49.25-49.3 m.
49.4-51.25 m	Light grey limestone **bedrock**; striated surface; black bituminous seams; minor chert.

LP-MW-15-10

Location: 556215m E 4746240m N, NAD83, Zone 17
Screened Interval: 2.4-5.5 m, 13.4-14.9 m, 20.1-21.6 m

Depth	Description
0.0-0.1 m	Brown sandy **topsoil**; compact; gradational lower contact.
0.1-0.25 m	Pea to cobble gravel, some black and oily; **fill**.
0.25-1.5 m	Oxidized brown silty very fine-textured **sand** to clayey silt; horizontal bedding, ripples, cross-bedding; some black laminae, soil, organic material; gradational lower contact. Sample at 0.75-0.8 m, 1.35-1.4 m.
1.5-1.7 m	Pea to pebble **gravel**; subrounded to rounded and polished, limestone; silty medium-coarse-textured sand matrix; loose; gradational lower contact.
1.7-2.5 m	Brown, oxidized, deformed, silty very fine- to coarse-textured **sand**; clayey sections; gradational lower contact. Sample at 1.9-2.0 m.
2.5-10.0 m	Pea to 3 cm pebble **gravel**, subrounded to rounded and polished limestone; silty coarse-textured sand matrix; massive; sharp lower contact. Sample at 3.25-3.3 m, 5.0-5.1 m, 6.25-6.3 m, 8.15-8.4 m, 9.25-9.3 m.
10.0-10.9 m	Brown medium-coarse- to coarse-textured **sand**; sharp lower contact. Sample at 10.75-10.8 m.
10.9-11.05 m	Pea to 3 cm pebble **gravel**, subrounded to rounded and polished limestone; silty coarse-textured sand matrix; massive; sharp lower contact.
11.05-11.2 m	Brown medium-coarse- to coarse-textured **sand**; sharp lower contact.
11.2-11.75 m	Pea to 3 cm **gravel;** subrounded to rounded and polished limestone; sharp lower contact.
11.75-12.5 m	Brown medium-coarse- to coarse-textured **sand** and minor silt; sharp lower contact. Sample at 12.25-12.3 m.
12.5-12.6 m	Granule to pea **gravel**; sharp lower contact.
12.6-13.0 m	Brown medium-coarse- to coarse-textured **sand**, minor silt; gradational lower contact.
13.0-14.8 m	Brown medium-coarse to coarse-textured **sand**, minor pea to pebble gravel; sharp lower contact. Sample at 13.45-13.5 m.
14.8-14.85 m	Granite cobble; subangular with rounded edges.
14.85-15.00 m	Oxidized grey-brown clayey **silt** to silty clay; grits and pebbles at the base; sharp lower contact.
15.00-23.6 m	Pale grey silty very fine-textured **sand**; minor heavy mineral laminae; red and grey clay rip-up clasts; minor grits and granules; some ripples and cross-bedding; grey with mauve hue clayey silt to silty clay rhythmites at 15.0-15.01 m, 15.05-15.06 m, 15.10-15.12 m, 15.23-15.25 m, 15.3-15.32 m, 15.4-15.43 m, 15.5-15.53 m, 15.67-15.69 m, 15.95-15.97 m, 16.1-16.12 m, 16.55-16.57 m, 16.8-16.83 m, 17.2-17.23 m, 17.75-17.76 m, 17.83-17.85 m, 17.9-17.91 m, 18.0-18.1 m, 18.14-18.15 m, 18.18-18.19 m, 18.25-18.3 m, 18.3-18.31 m, 18.6-18.61 m, 18.65-18.66 m, 19.25-19.27 m, 19.85-19.86 m, 20.3-20.32 m, 20.95-20.97 m, 21.35-21.38 m, 21.8-21.83 m, 22.1-22.11 m, 22.3-22.33 m,

	22.65-22.67 m, 22.72-22.76 m, 23.0-23.02 m, 23.7-23.79 m, 23.2-23.21 m, 23.25-23.26 m, 23.4-23.42 m; some rhythmites are deformed, faulted, and exhibit dewatering structures; coarsens to silty fine-textured sand at 19.00 m; ice-rafted debris at 23.0-23.5 m; gradational lower contact. Sample at 15.75-15.8 m, 17.0-17.05 m, 18.5-18.55 m, 19.5-19.55 m, 21.55-21.6 m, 22.5-22.55 m.
23.6-23.75 m	Grey-brown with mauve hue silty **clay**, clayey silt and sandy silt; ice-rafted debris; minor bedding; clay and silt laminae; clay balls; grits and granules; gradational lower contact.
23.75-23.97 m	Grey-brown sandy silt **diamicton**; ~10% grits to pea gravel, limestone fragments; massive; minor silt stringers; minor red clay intraclasts; gradational lower contact.
23.97-24.05 m	Grey-brown with mauve hue silty **clay**, clayey silt and sandy silt; ice-rafted debris; minor bedding; clay and silt laminae; clay balls; grits and granules; gradational lower contact.
24.05-24.45 m	Grey-brown sandy silt **diamicton**; ~10% grits to pea gravel, limestone fragments; massive; minor silt stringers; minor red clay intraclasts; gradational lower contact. Sample at 24.25-24.3 m.
24.45-24.65 m	Grey-brown with mauve hue silty **clay**, clayey silt and sandy silt; ice-rafted debris; minor bedding; clay and silt laminae; clay balls; grits and granules; gradational lower contact.
24.65-24.75 m	Grey-brown silty very fine-textured **sand**; ~10% grits and granules; gradational lower contact.
24.75-25.00 m	Grey-brown sandy silt **diamicton**; ~10% grits to pea gravel, limestone fragments; massive; minor silt stringers; minor red clay intraclasts; subangular limestone pebble at 24.8 m; gradational lower contact.
25.00-26.5 m	Limestone bedrock fragments recovered; poor recovery; likely sandy silt **diamicton**.
26.5-26.6 m	Grey-brown sandy silt **diamicton**; ~10% grits to pea gravel, limestone fragments; massive; minor silt stringers; minor red clay intraclasts; gradational lower contact.
26.6-26.75 m	Grey-brown sandy **silt**; massive; minor grits; gradational lower contact.
26.75-27.1 m	Pale grey-brown massive sandy silt **diamicton**; compact; many grits and granules up to 1 cm; limestone clasts; subrounded pebbles at the base of this unit; sharp lower contact. Sample at 26.8-26.85 m.
27.1-29.5 m	Pale grey to pale blue limestone **bedrock**; surface is striated; chert inclusions; black bituminous seams.

LP-MW-16-10

Location: 550117m E 4744330m N, NAD83, Zone 17
Screened Interval: 2.4-5.5 m, 32.3-33.8 m

Depth	Description
0.0-0.2 m	Brown **topsoil**; sharp lower contact.
0.2-0.35 m	Mildly oxidized brown fine-textured **sand**; minor granule gravel; sharp lower contact.
0.35-0.8 m	Oxidized silty fine-textured **sand**; dark orange-brown silty very fine-textured sand at top of this unit; mottled, perhaps disturbed by tilling; gradational lower contact. Sample at 0.6-0.7 m.
0.8-1.0 m	Oxidized brown sandy **silt**; mostly massive; minor dark oxidized or organic inclusions; gradational lower contact.
1.0-1.1 m	Oxidized tan silty very fine-textured **sand**; minor bedding, faulting; sharp lower contact.
1.1-1.5 m	Oxidized brown sandy **silt**; massive, very minor heavy mineral streaking; gradational lower contact. Sample at 1.15-1.25 m.
1.5-2.2 m	Oxidized brown silt to sandy **silt**; minor silty sand laminae; rare pebbles, subangular to subrounded limestone; sharp lower contact. Sample at 1.95-2.0 m.
2.2-3.25 m	Oxidized tan-brown silty very fine- to fine-textured **sand**; ripples, cross-bedding, heaving mineral streaking; structures are deformed; organic material observed at 2.5-3.0 m; gradational lower contact. Sample at 2.6-2.7 m.
3.25-3.35 m	Oxidized brown sandy **silt**; minor granules to pebbles, limestone; deformed but sharp lower contact.
3.35-4.2 m	Oxidized brown silty fine-textured **sand**; ripples, cross-bedding, heavy mineral streaking; minor pebbles, limestone; minor sandy silt stringers; sharp but deformed lower contact. Sample at 3.6-3.7 m.
4.2-4.5 m	Oxidized brown sandy **silt**; mostly massive but silt clayey silt beds and laminae at base; gradational lower contact. Sample at 4.25-4.35 m.
4.5-4.7 m	Oxidized brown silty very fine-textured **sand** to sandy silt; ripples, cross-bedding and heavy mineral streaking; sharp lower contact. Sample at 4.55-4.6 m.
4.7-4.85 m	Massive oxidized brown medium-fine-textured **sand**, minor silt; gradational lower contact.
4.85-6.00 m	Tan brown fine-textured **sand**, minor silt; ripples, cross-bedding, heavy mineral streaking (very dark in places); gradational lower contact. Sample at 5.45-5.5 m.
6.0-7.25 m	Brown medium- to medium-coarse-textured **sand**; massive, minor silt stringers; minor heavy mineral streaking; deformed lower contact. Sample at 6.25-7.25 m.
7.25-7.75 m	Oxidized brown sandy silt to silty very fine-textured **sand**; deformed and horizontal silt beds; minor medium-coarse-textured sand inclusions; ripples, cross-bedding, heavy mineral streaking, clayey silt bed; minor granules; sharp lower contact. Sample at 7.65-7.75 m.
7.75-10.5 m	Grey-brown with reddish hue silty very fine-textured **sand** and sandy silt; beds are highly deformed, including dewatering structures; 3 cm limestone pebble at 8.45 m; some

	ripples, cross-bedding and heavy mineral streaking; horizontal beds between 8.9 and 9.0 m some ice-rafted debris; becomes more massive at 9.8 m; silt stringers; sharp lower contact. Sample at 8.65-8.75 m, 9.25-9.35 m.
10.5-10.75 m	Grey-brown with mauve hue sandy **silt**; silt stringers, minor grits, granules; drop clasts, grey silty clay balls; ice-rafted debris; deformed lower contact. Sample at 10.0-10.10 m, 10.6-10.7 m.
10.75-12.00 m	Grey-brown with reddish hue silty very fine-textured **sand** to silty fine-textured sand; reddish clay beds at 11.8 m; some highly deformed and faulted beds; clay intraclast and rip-up clasts; silt stringers; gradational lower contact. Sample at 11.5-11.6 m.
12.00-13.5 m	Grey-brown very fine-textured **sand** to silt; horizontal bedding; some deformation; reddish clayey silt bed at 12.25 m; ripples and cross-bedding, heavy mineral streaking; minor clay drop clasts and rip-up clasts; some clayey silt laminae; gradational lower contact. Sample at 12.25-12.3 m, 13.0-13.05 m.
13.5-14.0 m	Grey-brown silty medium-fine- to fine-textured **sand**; some ripples, cross-bedding and heavy mineral streaking; some minor silty sections; minor clay intraclasts; organic material observed; sharp lower contact. Sample at 13.75-13.8 m.
14.0-15.0 m	Pale grey-brown with mauve hue silty very fine-textured **sand** to sandy silt; clayey silt beds; rip-up clasts and drop clasts; silt stringers; horizontal bedding and some ripples, cross-bedding and heavy mineral streaking; some highly deformed sections; organic material observed; gradational lower contact. Sample at 14.7-14.75 m.
15.0-18.0 m	Grey-brown with mauve hue silty fine- to very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; massive silt beds at 15.02-15.10 m, 15.35-15.45 m, 16.15-16.2 m; some red clay intraclasts; some truncated sand beds, truncated by sandy silt; coarsens to medium-textured sand at 17.35 m; organic bed at 17.5 m (1 cm thick); gradational lower contact. Sample at 15.35-15.4, 15.95-16.0 m, 17.0-17.05 m, 17.7-17.75 m.
18.0-24.00 m	Brown medium-textured **sand**; heavy mineral streaking; some coarse-textured sand lenses; clay intraclasts; minor ripples, cross-bedding; disturbed ripples and cross-bedding between 22.5 and 23.1 m; gradational lower contact. Sample at 18.0-19.5 m, 19.5-21.0 m, 21.0-22.5 m.
24.0-24.7 m	Brown medium-textured **sand**; ripples, cross-bedding and heavy mineral streaking; becomes fine-textured sand at 24.5 m; gradational lower contact. Sample at 24.25-24.3 m.
24.7-25.5 m	Grey-brown with mauve hue silty very fine-textured **sand** and sandy silt; some mauve clay balls, drop clasts; rip-up clasts; ripples and cross-bedding; silty sand beds at 24.7-24.85 m, 24.9-24.95 m, 25.2-25.25 m; gradational lower contact. Sample at 24.75-24.8 m.
25.5-29.0 m	Brown with mauve hue silty fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; organic material observed at 28.5-29.0 m; sharp lower contact. Sample at 25.5-27.0 m, 27.0-28.5 m.
29.0-29.25 m	Brown with reddish hue silty fine-textured **sand**; ripples, cross-bedding; many clayey granules throughout; clayey silt bed at 29.25 m; organic material observed; gradational lower contact.
29.25-33.0 m	Brown with mauve hue silty fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; minor fine-textured sand beds at 31.25 m; disturbed, deformed and dewatered at 31.5-33.0 m; organic material observed; sharp lower contact. Sample at 29.3-29.35 m, 30.0-31.5 m, 31.5-33.0 m.

33.0-34.5 m	Brown with mauve hue silty fine-textured **sand**; some ripples and cross-bedding, heavy mineral streaking; organic material observed; gradational lower contact.
34.5-39.75 m	Brown with mauve hue silty very fine-textured **sand**; some heavy mineral streaking, ripples, cross-bedding; reddish clayey silt at 34.8 m; ~1 cm bed of ice-rafted debris at 34.85 m; some dewatered sections; minor clay intraclasts; at 36.1 m grey-brown silty clay bed 2 cm thick; coarsens to medium-fine- to fine-textured sand at 38.35 m; organic material observed; gradational lower contact. Sample at 35.7-35.75 m, 35.9-35.95 m, 36.0-37.5 m, 37.5-39.0 m, 39.25-39.35 m.
39.75-43.5 m	Brown with mauve hue silty very fine- to fine-textured **sand**; ripples, cross-bedding, heavy mineral streaking; at 40.10-10.12 m clayey silt bed; minor grey clay intraclasts, dropstones; organic material observed at 39.75-40.5 m, 42.0-43.5 m; gradational lower contact. Sample at 40.2-40.25 m, 40.5-42.0 m, 42.0-43.5 m.
43.5-46.5 m	Grey-brown with mauve hue silty very fine-textured **sand**; ripples, cross-bedding; heavy mineral streaking; grey-brown with red hue silty clay beds at 43.77-43.79 m, 45.2-45.24 m, 46.15-46.2 m; some deformation of clayey silt beds; gradational lower contact. Sample at 43.5-45.0 m, 45.5-45.55 m.
46.5-59.15 m	Grey-brown silty very fine-textured **sand**; clayey silt to silty clay rhythmites at 46.6-46.7 m, 46.75-46.8 m, 47.3-47.35 m, 47.75-47.8 m, 51.65-51.75 m, 52.73-52.78 m, 53.29-53.4 m, 54.75-54.95 m, 55.4 m, 55.7-55.95 m, 56.25-56.3 m, 57.05-57.2 m, 57.28-57.35 m, 57.65-57.7 m, 57.8-58.0 m, 58.85-59.0 m; angular grey clay rip-up and drop clasts; silt stringers; red clay rip-up and drop clasts; horizontal bedding; red shale grits and granules at 51.6-51.62 m; black grit bed (1 cm thick) at 51.45 m; black shale pebbles at 53.25 m, ~2 cm in diameter; medium-textured sand at 54.2-54.25 m and underlying silty very fine-textured sand is faulted; some silt stringers within rhythmite beds; sharp lower contact. Sample at 46.79-46.83 m, 47.5-47.6 m, 48.25-48.3 m, 50.0-50.05 m, 51.25-51.3 m, 51.73-51.75 m, 52.95-53.0 m, 53.35-53.4 m, 54.45-54.5 m, 54.75-54.8 m, 55.8-55.85 m, 56.5-56.55 m, 58.1-58.15 m.
59.15-59.65 m	Grey-brown with mauve hue clayey **silt**; silt stringers; rip-up clasts; many grits and granules; some limestone pebbles; grey clay intraclasts; deformed sections; ice-rafted debris; slumping; gradational lower contact. Sample at 59.5-59.55 m.
59.65-60.0 m	Grey-brown with mauve hue clayey **silt**; some grey horizontal banding; silt laminae at 59.95 m; black grits; rip-up clasts and ice-rafted debris; gradational lower contact.
60.0-60.2 m	Grey brown with red hue clayey **silt** to silty clay; gradational lower contact.
60.2-60.4 m	Reddish clayey **silt** rhythmites at 60.2-60.24 m, and 60.27-60.32 m underlying rhythmites is silt, many rip-up clasts and clay granules; grits to pea gravel shale clasts; at 60.35-60.37 m red shale grits, granule bed; gradational lower contact.
60.4-61.5 m	Grey-brown with mauve hue sandy silt **diamicton**; ~10% grits to pebbles; fractured limestone clasts, subangular to subrounded; at 61.0-61.04 m silt laminae, silt caps on clasts; faulted laminae; waterlain sections; gradational lower contact. Sample at 60.5-60.55 m.
61.5-62.25 m	No recovery.
62.25-63.65 m	Grey-brown mauve hue compact sandy silt **diamicton**; possible till; limestone clasts, grits to 4 cm, a boulder at base; bedrock fragments; sharp lower contact. Sample at 62.45-62.5 m, 63.1-63.15 m.
63.65-65.25 m	Grey limestone **bedrock**; upper surface is striated; bedrock is fractured, bituminous, some fossiliferous sections.

LP-MW-17-10

Location: 546561m E 4740782m N, NAD83, Zone 17
Screened Interval: 1.8-4.9 m, 13.7-15.8 m, 25.9-27.4 m, 50.3-51.8 m

Depth	Description
0.0-1.5 m	Brown to orange-brown silty fine- to medium-fine-textured sandy **topsoil**; stony at 0.2 m and 0.5 m; some silty sections; highly disturbed organic layers at 1.5 m. Sample at 0.25-0.3 m, 1.0-1.05 m.
1.5-1.75 m	Oxidized brown silty fine-textured **sand**; heavy mineral banding; ripples, cross-bedding; sharp lower contact.
1.75-1.9 m	Brown massive sandy **silt**; minor heavy mineral streaking; sharp lower contact. Sample at 1.8-1.85 m.
1.9-3.0 m	Brown silty medium-textured **sand**; ripples, heavy mineral streaking; gradational lower contact. Sample at 2.55-2.6 m.
3.0-4.0 m	Brown medium-textured **sand**; minor heavy mineral streaking, subhorizontal; clast free; very minor silt; gradational lower contact. Sample at 3.25-3.3 m.
4.0-4.7 m	Brown medium-fine-textured **sand**; ripples and cross-bedding; heavy mineral streaking; gradational lower contact. Sample at 4.05-4.1 m.
4.7-5.15 m	Brown medium-textured **sand**, minor silt; clast free; very minor heavy mineral streaking; gradational lower contact. Sample at 4.9-5.05 m.
5.15-5.45 m	Brown medium-fine-textured **sand**, minor silt; minor pebbles up to 2-3 cm in diameter, rounded, some polished, limestone; gradational lower contact. Sample at 5.25-5.35 m.
5.45-6.0 m	Brown coarse-textured **sand** to granule gravel; very minor silt; some rounded and polished limestone pebbles up to 2 cm; gradational lower contact. Sample at 5.75-5.95 m.
6.0-7.5 m	Brown fine- to coarse-textured **sand**; minor granule to pebble gravel, 1-2 cm in diameter; minor silt; clasts are rounded to subrounded, some polished, limestone; poor recovery, drill mud washing out waterlain sands; gradational lower contact. Sample at 6.0-7.5 m.
7.5-9.0 m	Brown medium- to coarse-textured **sand**; ~5% granule to 1-2 cm gravel, limestone, subrounded to rounded and some polished; clean; heavy mineral banding at 7.7 m ~1 cm thick, subhorizontal; red granules and grits throughout; at 8.75 m coarsens to coarse-textured sand to granule gravel matrix, minor sand; gradational lower contact. Sample at 7.5-9.0 m.
9.0-10.5 m	Brown coarse- to very coarse-textured sand to granule **gravel**; ~5% granule to 2 cm pebbles, subrounded, polished, limestone; red granules throughout; very minor silt; minor heavy mineral banding, beds at 9.25 m up to 1 cm thick; gradational lower contact. Sample at 9.0-10.5 m.
10.5-11.5 m	Interbedded brown medium-coarse-textured **sand** and coarse-textured sand; dipping beds, ~1-2 cm thick; some heavy mineral banding; some red granules observed; very minor silt; sharp lower contact.

11.5-12.0 m	Brown coarse-textured **sand**; minor heavy mineral banding; minor silt; black shale granules throughout, some weathered *in situ* to sand; gradational lower contact. Sample at 10.5-12.0 m.
12.0-12.45 m	Brown medium-textured **sand**, minor silt; gradational lower contact.
12.45-12.5 m	Pale tan silty fine-textured **sand**; silt laminae, deformed; gradational lower contact.
12.5-13.5 m	Brown medium-textured **sand**, minor silt; minor heavy mineral banding; silty inclusion at 12.55 m; gradational lower contact. Sample at 13.0-13.5 m.
13.5-13.95 m	Brown coarse-textured **sand**; <5% granule to 2 cm pebbles, limestone, subrounded to rounded and polished; some black shale granules; clay laminae at 13.85 m; sharp lower contact. Sample at 13.55-13.8 m.
13.95-15.00 m	Interbedded grey very fine-textured **sand**, pale grey silt and grey-brown with mauve hue clay; some ripples, cross-bedding and heavy mineral streaking in the very fine-textured sand; some horizontal bedding; some clay rip-up clasts with clay beds; some highly deformed beds; red clay laminae at the top of this unit; ice-rafted debris at 14.35 m; some minor red clay granular inclusions; gradational lower contact. Sample at 14.1-14.13 m, 14.55-14.7 m.
15.0-16.5 m	Tan **silt** with deformed beds, laminae and stringers of grey-brown clay; some silty very fine-textured sand with heavy mineral banding, ripples and cross-bedding, truncated ripples, faulted and deformed; many dewatering structures; minor clay granule inclusions; some dropstones in clay beds; gradational lower contact. Sample at 15.5-15.65 m, 16.05-16.15 m.
16.5-18.0 m	Pale grey silty very fine-textured **sand**; ripples, cross-bedding, heavy mineral streaking; interbedded with grey-brown to mauve clay, grey-brown silt; some sections highly deformed, faulted; some minor clay rip-up sand drop clasts between 16.8 and 17.2 m beds are dipping, remainder are horizontal to subhorizontal; some red clay beds; organic material observed; gradational lower contact. Sample at 17.0-17.05 m, 17.75-17.8 m.
18.0-19.5 m	Brown silty very fine-textured **sand**, with minor heavy mineral streaking, ripples and cross-bedding interbedded with grey-brown to red-grey-brown clay and silt; some red clay beds; clay laminae, and up to 5 cm thick; clay is highly deformed in sections, i.e., 18.78-19.5 m; dipping and becoming subvertical and deformed at 19.0 m; rip-up clasts; minor dropstones; gradational lower contact. Sample at 18.5-18.6 m, 19.0-19.1 m.
19.5-21.0 m	Silty very fine-textured **sand**, interbedded with clay and silt; some beds subhorizontal, others are highly deformed to almost subvertical; faulted and truncated beds; clay inclusions; some red-clay beds and red clay clasts; gradational lower contact. Sample at 19.95-20.0 m, 20.25-20.3 m.
21.0-27.0 m	Tan silty very fine-textured **sand** interbedded with grey-brown clay; some highly deformed and faulted silty clay inclusions and dropstones; some red clay rip-up clasts; at 23.3-23.45 m three beds of red granular debris, ~3 cm apart separated by interbedded silty very fine-textured sand and clay; organic material observed at 21.0-22.5 m; gradational lower contact. Sample at 21.5-21.55 m, 23.45-23.48 m, 23.7-23.75 m, 24.55-24.58 m, 25.0-25.05 m, 26.3-26.35 m.
27.0-28.5 m	Grey-brown to grey **silt** and sandy silt with interbeds of grey-brown with mauve hue clay; rhythmites at 27.0 m, 27.25 m, 27.6 m, 27.8 m, 28.1 m, 28.25 m, thin to 3-4 cm thick, commonly separated by a bed of sandy silt with minor heavy mineral banding; most beds are horizontal but some are highly deformed; rip-up clasts, grey clay; minor red clay intraclasts; gradational lower contact. Sample at 27.7-27.75 m.

28.5-30.0 m	Pale grey to grey-brown with slight mauve hue beds of silty very fine-textured **sand**, clay, clayey silt, and sandy silt; rip-up clasts, deformation, faulting and dewatering structures; clay intraclasts; some ice-rafted debris; red shale granules and clay granules; some subhorizontal beds; gradational lower contact. Sample at 28.85-28.95 m.
30.0-31.5 m	Pale grey-brown silty very fine-textured **sand** to sandy silt with grey-brown clay beds at 30.0 m, 30.25 m, 31.0 m; some ripples and cross-bedding in sands, minor heavy mineral streaking; clay drop clasts; some highly deformed sections; gradational lower contact. Sample at 30.85-30.95 m.
31.5-33.0 m	Grey-brown sandy **silt**; minor clay beds at 31.75 m, 32.6 m, 32.85 m; grey brown to dark grey rip-up clasts, drop clasts; minor ripples and cross-bedding; some deformation, dewatering structures; gradational lower contact. Sample at 32.25-32.3 m.
33.0-34.5 m	Pale grey silty very fine-textured **sand**; ripples and cross-bedding, heavy mineral banding; grey-brown clay beds at 33.0 m, 33.95 m, 34.45 m; some clay intraclasts and drop clasts; some deformed beds; gradational lower contact. Sample at 33.5-33.55 m.
34.5-36.0 m	Grey-brown silty very fine-textured **sand** to sandy silt; grey-brown to red-grey-brown clayey silt to silty clay rhythmites at 34.85 m, 35.2 m, 35.45 m, 35.75 m, separated by dark grey debris-rich silty clay; some bioturbation; drop clasts, clay inclusions; some ripples, cross-bedding and heavy mineral banding; gradational lower contact. Sample at 35.0-35.05 m, 35.4-35.45 m.
36.0-37.75 m	Pale grey **silt** and grey-brown to red-grey-brown silty clay rhythmites at 36.25 m, 36.45 m, 36.7 m, 36.8 m, 37.0 m, 37.2 m, 37.3 m, 37.55 m, 37.7 m, silts are laminated, minor heavy mineral streaking; clay rip-up clasts; some of the silt is highly deformed, containing large amounts of ice-rafted debris; gradational lower contact. Sample at 36.25-36.3 m, 37.1-37.15 m, 37.55-37.6 m.
37.75-39.0 m	Grey-brown clayey **silt** to silty clay; pale grey silt lenses and interbeds; deformed faulted, dewatering structures; ice-rafted debris band at 38.5-38.53 m; grits and granules and clay intraclasts located throughout the unit; gradational lower contact. Sample at 38.48-39.53 m.
39.0-40.0 m	Pale grey **silt** and grey-brown to red-grey-brown silty clay rhythmites; rhythmites are highly faulted and deformed silts are laminated, minor heavy mineral streaking; clay rip ups; some of the silt is highly deformed, containing large amounts of ice-rafted debris; gradational lower contact. Sample at 39.5-39.55 m.
40.0-40.5 m	Dark grey-brown clayey **silt** to silty clay; some red clay beds; silt stringers; folded, faulted, dewatering structures; some minor drop clasts; gradational lower contact. Sample at 40.25-40.3 m.
40.5-40.95 m	Grey-brown clayey **silt** to silty clay; some silt stringers; dipping beds; some reddish hue to clay; grey clay intraclasts with draped beds; deformed lower contact.
40.95-41.3 m	Grey-brown **silt**; some grey-brown clayey silt beds; 3 beds of dark grey clay deformed into clasts; at 41.0 m an “M”-shaped fold; at 41.1 m, and 41.2 m dipping and mildly folded beds; sharp but faulted lower contact. Sample at 41.0-41.05 m.
41.3-42.0 m	Grey-brown clayey **silt** to silty clay; some reddish beds; highly deformed silt stringers; some drop clasts; gradational lower contact. Sample at 41.6-41.65 m.
42.0-42.2 m	Grey-brown clayey **silt** to silty clay; some silt stringers; ~5% black shale limestone grits and granules scattered throughout; gradational lower contact. Sample at 42.02-42.07 m.
42.2-42.7 m	Grey-brown clayey **silt** to silty clay with silt stringers; minor dropstones; minor deformation of silt laminae, stringers; gradational lower contact. Sample at 42.6-42.7 m.

42.7-43.4 m	Grey-brown silty **clay** to clayey silt; silt lenses, stringers, laminae; becomes siltier between 43.2 and 43.4 m; some highly deformed sections, some subhorizontal; minor dropstones; some grey clayey silt beds; gradational lower contact.
43.4-43.5 m	Pale grey **silt** to silty very fine-textured sand; massive; gradational lower contact. Sample at 43.45-43.5 m.
43.5-43.75 m	Grey-brown **silt** and clayey silt interbeds, some highly faulted, deformed; minor grits and granules, drop clasts; some red clay intraclasts; sharp but deformed lower contact.
43.75-44.45 m	Three beds of 3-5 cm thick dark grey-brown clayey **silt**, base of this unit very stony with ice-rafted debris, between these is pale grey-brown silt; ~10% grits and granules, clay clasts, some black and red; at 44.10 m a 4 cm granite clast and another at base of this unit; some rip-up clasts of silty clay beds into silt; ice-rafted debris, large amounts of melt-out material; sharp lower contact. Sample at 43.85-43.9 m.
44.45-44.6 m	Brown silty very fine-textured **sand**; massive; dipping but sharp lower contact. Sample at 44.5-44.55 m.
44.6-45.0 m	Interbedded brown silty fine-textured **sand** and dark brown silt; beds are deformed; gradational lower contact. Sample at 44.75-44.8 m.
45.0-45.35 m	Interbeds of grey-brown clayey **silt**, silty clay, silt and silty very fine-textured sand to fine-textured sand; faulted, deformed; some laminae some very minor grey clay intraclasts; organic material observed; sharp lower contact. Sample at 45.1-45.15 m.
45.35-46.5 m	Grey-brown to grey silty very fine- to fine-textured **sand** and some clayey silt beds; minor heavy mineral streaking, ripples and cross-bedding; organic material observed; gradational lower contact. Sample at 45.5-45.55 m, 45.95-46.0 m.
46.5-48.0 m	Brown medium-fine-textured **sand** and minor silt; ripples, cross-bedding, heavy mineral streaking; very minor clay drop clasts ~1 cm in diameter at 46.75 m; gradational lower contact. Sample at 46.5-48.0 m.
48-49.5 m	Brown fine-textured **sand**, minor silt; ripples, cross-bedding and heavy mineral streaking; gradational lower contact. Sample at 48.0-49.5 m.
49.5-50.2 m	Brown fine- to medium-fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; brown silty very fine-textured sand beds at 49.85-49.9 m, and 50.0-50.05 m; gradational lower contact. Sample at 49.7-49.75 m.
50.2-50.6 m	Brown very fine- to fine-textured **sand**; minor red-brown silt beds at 50.50 m; ripples, cross-bedding and heavy mineral streaking; gradational lower contact. Sample at 50.4-50.45 m.
50.6-51.0 m	Brown fine- to very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; lens of black grits at 50.7 m; minor clay intraclasts; gradational lower contact.
51.0-52.5 m	Brown fine- to very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; at 51.0 m very fine-textured sand with ~5-10% clay intraclasts, grey pale and dark; gradational lower contact. Sample at 51.0-51.1 m, 51.1-52.5 m.
52.5-54.0 m	Brown fine-textured **sand**, minor silt; ripples, cross-bedding and heavy mineral streaking; very minor grits and granules and clay clasts; gradational lower contact. Sample at 52.5-54.0 m.
54.0-55.5 m	Brown to tan silty very fine-textured **sand** to sandy silt; between 54.75 and 55.1 m many clay clasts, drop clasts; some ripples, cross-bedding; very minor horizontal bedding; gradational lower contact. Sample at 54.9-55.0 m.

55.5-57.0 m	Brown silty fine- to very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; minor clay intraclasts; gradational lower contact. Sample at 55.5-57.0 m.
57.0-58.5 m	Brown silty fine- to very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; clay balls and granules randomly throughout; gradational lower contact. Sample at 57.0-58.5 m.
58.5-60.0 m	Brown silty fine- to very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; silt and clay intraclasts throughout; red-brown silt bed 3-4 cm thick at 58.7 m; gradational lower contact. Sample at 58.5-60.0 m.
60.0-61.5 m	Brown silty very fine-textured **sand** to sandy silt; black and red clay granules throughout; highly deformed and dewatered; gradational lower contact. Sample at 60.0-61.5 m.
61.5-63.2 m	Brown silty very fine-textured **sand** to sandy silt; clay and silt drop clasts throughout; deformed reddish-brown clayey silt bed at 61.7 m ~3 cm thick and capped with black grits and granules; reddish hue to the sediment between 62.5 and 63.0 m; gradational lower contact. Sample at 61.7-61.73 m, 62.6-62.65 m.
63.2-63.75 m	Grey-brown to red-brown **silt** and clayey silt; silt beds contain ice-rafted debris; deformed beds; silt dominates between 63.5 and 63.75 m; reddish hue, highly deformed; base of unit is silty clay to clayey silt bed with minor grits and granules; gradational lower contact. Sample at 63.2-63.25 m.
63.75-64.5 m	Brown silty very fine-textured sandy **diamicton**; stony, reddish hue; subangular to subrounded limestone; gradational lower contact. Sample at 63.75-63.8 m.
64.5-66.0 m	Pale grey **limestone**; bituminous; pale tan inclusions; irregular black laminae.

LP-MW-18-10

Location: 547644m E 4744614m N, NAD83, Zone 17
Screened Interval: 3.0-6.1 m, 10.7-12.2 m, 25.9-27.4 m

Depth	Description
0.0-0.25 m	Black **topsoil**; pea to pebble limestone gravel bed at 0.2 m, subrounded and some polished; sharp but deformed lower contact.
0.25-0.5 m	Massive, loose, brown medium-fine-textured **sand**; minor heavy mineral streaking; sharp and deformed lower contact. Sample at 0.4-0.45 m.
0.5-0.95 m	Oxidized brown silty medium-fine- to fine-textured **sand**, massive; deformed lower contact.
0.95-1.2 m	Oxidized brown **silt** to silty medium-fine-textured sand; minor heavy mineral streaking, ripples and cross-bedding; deformed; sharp lower contact. Sample at 1.0-1.05 m.
1.2-1.5 m	Pale brown silty fine- to medium-fine-textured **sand**; very loose and disturbed; blocks of sand with heavy mineral streaking; gradational lower contact.
1.5-1.75 m	Brown silty fine- to medium-fine-textured **sand**; silty very fine-textured sand beds at 1.55 m and 1.6 m; some heavy mineral streaking; lower contact is faulted and deformed.
1.75-2.0 m	Brown silty medium-fine-textured **sand**; heavy mineral streaking, deformed heavy mineral laminae; subhorizontal brown silt bed at base ~0.5 cm thick; deformed lower contact. Sample at 1.8-1.9 m.
2.0-2.25 m	Brown silty medium-textured **sand**; thick heavy mineral streaking; dipping subhorizontal beds; minor grits and granules; prominent heavy mineral bed at base; sharp but deformed lower contact.
2.25-2.9 m	Brown interbedded, clean medium- and medium-coarse-textured **sand**; very loose; clast free; gradational lower contact. Sample at 2.3-2.35 m.
2.9-3.05 m	Clean, brown medium-textured **sand**; very minor silt stringers; gradational lower contact.
3.05-3.25 m	Brown medium-fine-textured **sand**, minor silt; heavy mineral banding, highly deformed; some oxidized beds; gradational lower contact. Sample at 3.15-3.2 m.
3.25-3.4 m	Brown medium-fine-textured **sand**; minor silt; minor subhorizontal heavy mineral banding; gradational lower contact.
3.4-3.6 m	Brown medium-coarse-textured **sand**; highly deformed heavy mineral streaking; gradational lower contact.
3.6-4.0 m	Clean, brown medium-fine-textured **sand**; very minor heavy mineral streaking; gradational lower contact. Sample at 3.65-3.7 m.
4.0-8.0 m	Brown medium-textured **sand**, minor silt; minor granule gravel; gradational lower contact. Sample at 4.0-5.5 m, 5.5-6.25 m, 7.0-7.75 m.
8.0-8.05 m	Brown silty fine-textured **sand**; 1 cm red shale clast; gradational lower contact.
8.05-8.5 m	Brown silty fine-textured **sand**; heavy mineral streaking; gradational lower contact.

8.5-10.0 m	Brown massive medium- to medium-coarse-textured **sand**; heavy mineral streaking; gradational lower contact. Sample at 8.5-10.5 m.
10.0-11.5 m	Brown silty medium-textured **sand**; very minor clay inclusions; minor heavy mineral streaking; gradational lower contact. Sample at 10.0-11.5 m.
11.5-13.0 m	Brown silty fine- to medium-fine-textured **sand**; at 12.10 m and 12.3 m heavy mineral streaking 5-10 cm thick; gradational lower contact. Sample at 11.5-13.0 m.
13.0-13.7 m	Brown silty fine- to medium-textured **sand**; between 13.05 and 13.10 m interbedded with silty very fine-textured sand, ripples, cross-bedding, heavy mineral streaking; at 13.1 m two beds of grey sandy silt separated by a bed of dark grey gritty clayey silt; gradational lower contact. Sample at 13.3-13.65 m.
13.7-14.5 m	Grey-brown clayey **silt** to silty clay; some red beds; two pale grey silty very fine-textured sand beds at 14.1 m and 14.5 m ~1 cm thick; medium-textured sand laminae at 14.25 m, 14.3 m, 14.4 m, 14.42 m a few grains thick; beds are faulted and deformed; dewatering structures present; ice-rafted debris in red bed below grey fine-textured sand at 14.15 m; gradational lower contact. Sample at 13.8-13.9 m.
14.5-15.2 m	Grey-brown to pale grey silty **clay**, clayey silt and silty very fine-textured sand beds; deformed red clay bed at 14.8 m; ice-rafted debris; pale grey silty sand interbedded with reddish clayey silt and highly deformed; 3 cm pebble at base; gradational lower contact. Sample at 14.85-14.9 m.
15.2-16.0 m	Pale grey **silt** to silty very fine-textured sand; ripples and cross-bedding; ice-rafted debris bed at 15.4 m and 15.45 m; highly variable, beds of silt are deformed, some grits and granules and clay intraclasts; beds dipping into underlying sediment; gradational lower contact. Sample at 15.4-15.45 m.
16.0-16.05 m	Grey-brown **silt** to clayey silt; red bed ~2 cm thick separated by grey silty very fine-textured sand; organic material observed; gradational lower contact.
16.05-16.2 m	Massive pale grey-brown sandy **silt**; ripples, cross-bedding, heavy mineral streaking; organic material observed; sharp lower contact.
16.2-16.35 m	Massive pale grey-brown sandy **silt**; minor silt laminae; organic material observed; sharp lower contact. Sample at 16.25-16.3 m.
16.35-16.8 m	Massive pale grey-brown sandy **silt**; ripples, cross-bedding heavy mineral streaking; organic material observed; sharp lower contact. Sample at 16.6-16.65 m.
16.8-17.05 m	Pale grey clean fine-textured **sand**; organic material observed; gradational lower contact. Sample at 16.95-17.04 m.
17.05-17.5 m	Pale grey-brown **silt** to silty very fine-textured sand; some ripples and cross-bedding; lower 20 cm is highly deformed; some medium-textured sand, highly deformed; organic material observed; gradational lower contact.
17.5-19.0 m	Grey-brown silty very fine-textured **sand** to fine-textured sand; at 17.75 m highly deformed silty medium-textured sand; at 17.7 m red silty clay to clayey silt horizontal bed; deformed heavy mineral streaking at 18.1 m, 18.4 m, 18.75 m; some silt laminae and stringers, also highly deformed; dewatering structures present; organic material observed; gradational lower contact. Sample at 17.75-17.8 m, 18.6-18.65 m.
19.0-20.5 m	Grey-brown with red hue medium-fine- to fine-textured **sand** to sandy silt; some ripples, cross-bedding, all highly deformed; minor clay inclusions; gradational lower contact. Sample at 19.0-20.5 m.

20.5-23.5 m	Grey-brown silty very fine-textured **sand**; minor bedding; minor heavy mineral streaking; minor ripples and cross-bedding; minor clay intraclasts; organic material observed; gradational lower contact. Sample at 20.5-22.0 m, 22.0-23.5 m.
23.5-23.8 m	Grey-brown with red hue silty very fine-textured **sand** to sandy silt; some medium- and coarse-textured sand; minor heavy mineral streaking, ripples and cross-bedding; at 23.77 m a bed of dark grey-brown clayey silt; sharp lower contact.
23.8-24.25 m	Grey-brown silty medium- to medium-coarse **sand**; heavy mineral streaking throughout; ripples and cross-bedding; minor clay inclusions; gradational lower contact. Sample at 23.9-24.2 m.
24.25-25.0 m	Grey-brown silty medium-fine-textured **sand**, minor sandy silt beds; minor grits; gradational lower contact. Sample at 24.35-24.45 m.
25.0-26.5 m	Grey-brown silty fine- to medium-textured **sand**; some heavy mineral streaking, minor ripples and cross-bedding; coarsens to medium-coarse-textured sand at 26.0 m; gradational lower contact. Sample at 25.0-26.5 m.
26.5-28.55 m	Grey-brown medium- to coarse-textured **sand**, massive; fines to medium-fine-textured sand at 27.9 m; gradational lower contact. Sample at 26.5-28.0 m.
28.55-31.0 m	Grey-brown silty medium-textured **sand**, minor coarse-textured sand; pebbles at top of this unit, rounded white limestone; gradational lower contact. Sample at 28.55-29.5 m, 29.5-30.5 m.
31.0-32.75 m	Grey-brown silty medium-fine-textured **sand**, minor silty very fine-textured sand; heavy mineral streaking; some ripples and cross-bedding; gradational lower contact. Sample at 31.0-31.6 m.
32.75-33.2 m	Grey-brown silty medium-fine-textured **sand**; heavy mineral streaking; ripples and cross-bedding; dipping but sharp lower contact. Sample at 32.75-33.2 m.
33.2-33.45 m	Grey-brown with red hue silty very fine-textured **sand** to sandy silt; coarse-textured sand bed at top and bottom of this unit; sharp lower contact. Sample at 33.2-33.4 m.
33.45-33.75 m	Grey-brown with red hue silty very fine-textured sand; minor heavy mineral streaking; minor medium-coarse-textured sand beds, disturbed; minor grits; gradational lower contact. Sample at 34.0-35.5 m.
33.75-35.5 m	Grey-brown with red hue medium-fine-textured **sand** coarsening to medium-coarse-textured sand; coarse-textured sand at 34.5 m; silty very fine-textured sand at 34.7 m, ~1 cm thick; heavy mineral streaking; ripples and cross-bedding; gradational lower contact.
35.5-36.6 m	Grey-brown with reddish hue silty fine- to medium-fine-textured **sand**; ripples and cross-bedding; heavy mineral streaking, highly deformed; some deformed and truncated coarse-textured sand beds; at 36.00 m a 4 cm thick bed of grey-brown silty clay, dipping; at 36.1 m deformed silty clay bed; streaking of clay at 36.25 m; coarse-textured sand at base of this unit; organic material observed; sharp lower contact. Sample at 35.5-35.8 m, 35.9-36.0 m.
36.6-37.0 m	Grey-brown silty very fine-textured **sand**; minor red clay laminae, heavy mineral streaking; reddish hue at base; organic material observed; gradational lower contact. Sample at 36.6-36.7 m.
37.0-37.45 m	Grey-brown silty fine- to very fine-textured **sand**; heavy mineral streaking, ripples and cross-bedding; some reddish clayey silt at top of this unit; organic material observed; gradational lower contact. Sample at 37.15-37.45 m.

37.45-37.55 m	Reddish grey clayey **silt** and grey-brown silty very fine-textured sand; clayey silt beds are deformed and truncated; organic material in sands; sharp lower contact.
37.55-37.7 m	Reddish grey-brown silty very fine-textured **sand**, minor clayey silt; minor coarse-textured sand; highly disturbed; organic material observed; gradational lower contact.
37.7-38.5 m	Grey-brown silty very fine-textured **sand** interrupted by beds of red-grey clayey silt at 37.8 m, 37.9 m, and 38.2 m; some dark grey clayey silt beds, subhorizontal; organic material observed; gradational lower contact. Sample at 38.0-38.03 m.
38.5-40.0 m	Grey-brown with reddish hue clayey **silt** to silty clay; dark grey beds at 38.75 m; many grits and granules, some red shale granules; horizontal bedding marked by variation in sediment colour; ice-rafted debris at 39.0 m, 39.35 m, 39.4 m, 39.5 m, 39.8 m; some clay inclusions; red clay clast at 38.75 m ~2 cm diameter; highly weathered; gradational lower contact. Sample at 39.1-39.15 m, 39.5-39.55 m.
40.0-41.5 m	Grey-brown with red hue clayey **silt**; much ice-rafted debris, grits and granules ~5%; grey clay inclusions and minor limestone pebbles; silt stringers; some massive beds and laminae; >2 cm thick highly deformed silt beds at 41.0 m, 41.1 m, 41.25 m, gradational lower contact. Sample at 40.5-40.15 m.
41.5-45.7 m	Grey-brown with red hue **silt** to silty very fine-textured sand and clayey silt; ice-rafted debris, red clay, grey clay and red shale grits and granules; silt stringers; massive reddish clayey silt bed at 42.15-42.25 m; some deformed, truncated and faulted beds; fine silt and silty very fine-textured sand laminae; rare limestone pebbles; massive silt bed at 43.5-43.75 m; ice-rafted debris at 44.75 m and 45.0 m; highly deformed, disturbed; gradational lower contact. Sample at 41.85-41.95 m, 42.2-42.25 m, 43.6-43.7 m, 44.25-44.29 m, 45.15-45.2 m.
45.7-46.0 m	Grey-brown to red-grey-brown clayey silt **diamicton**; many grits and granules ~5-10%; red clay and red shale clasts; massive; gradational lower contact. Sample at 45.75-45.8 m.
46.0-51.75 m	Grey very compact clayey silt **diamicton**; limestone cobbles at 43.25 m, and 46.25 m, polished and striated; ~10% grits to cobble, most 1-2 cm in diameter, subangular to subrounded; sharp lower contact. Sample at 46.75-46.8 m, 48.0-48.05 m, 50.0-50.05 m, 561.0-51.1 m.
51.75-52.0 m	Grey-brown to mauve clayey **silt**; silt stringers; gradational lower contact.
52.0-53.5 m	Grey-brown to mauve clayey **silt** to silty clay; minor clasts, silt stringers; some faulting and deformation; gradational lower contact. Sample at 52.95-53.0 m, 53.2-53.25 m.
53.5-54.7 m	Grey-brown with red hue clayey **silt**; much ice-rafted debris; very red shale debris at 54.35 m; minor silt stringers; sharp lower contact. Sample at 54.0-54.05 m.
54.7-54.95 m	Pale grey-brown **silt**; minor grey silty clay; horizontal and deformed beds; sharp lower contact.
54.95-56.5 m	Pale grey limestone **bedrock**; bituminous.

LP-MW-19-10

Location: 545291m E 4744186m N, NAD83, Zone 17
Screened Interval: 2.1-5.2 m

Depth	Description
0-0.6 m	Black **topsoil**, silty medium-fine-textured sand; disturbed lower contact.
0.6-1.0 m	Brown medium-textured **sand**, disturbed with some oxidized sections, minor grits and granules; gradational lower contact. Sample at 0.8-0.85 m.
1.0-1.05 m	Brown silty very fine-textured **sand**, heavy mineral accumulations; sharp lower contact.
1.05-1.08 m	Upper 0.5 cm grey-brown clay bed underlain by grey **silt**; sharp lower contact.
1.08-1.5 m	Grey-brown medium-textured sand to granule **gravel** and pebble gravel; limestone clasts are subrounded to rounded and polished; minor silt. Sample at 1.1-1.5 m.
1.5-3.25 m	Brown medium-textured **sand** to granule gravel, approximately 5-10% pebble gravel, limestone, subrounded to rounded, polished. Sample at 1.5-1.85 m, 1.85-3.25 m.
3.25-5.65 m	Brown, clean medium- to coarse-textured **sand**, approximately 5% pebble gravel, up to 2 cm in diameter, limestone, subrounded to rounded and polished. Sample at 3.25-4.75 m, 5.15-5.55 m.
5.65-5.85 m	Brown silty medium-textured **sand**; sharp lower contact. Sample at 5.75-5.85 m.
5.85-6.0 m	Compact grey-brown silty medium-fine-textured **sand**.
6.0-6.25 m	Pea **gravel**, limestone, rounded and polished.
6.25-6.8 m	Brown very coarse-textured **sand** to pea gravel, rounded clasts, some red shale clasts, mostly limestone; gradational lower contact. Sample at 6.25-6.8 m.
6.8-7.1 m	Brown very coarse-textured **sand**, minor pea to pebble gravel, limestone clasts are subrounded to rounded and polished; gradational lower contact. Sample at 6.8-7.1 m.
7.1-7.4 m	Brown medium- to very coarse-textured **sand** and approximately 10% pea to pebble gravel; limestone clasts are subrounded to rounded and polished, up to 4 cm diameter, minor red shale clasts; gradational lower contact.
7.4-7.75 m	Brown silty medium- to coarse-textured **sand**, approximately 5% pea to pebble gravel, limestone subrounded to rounded and polished, minor red shale clasts. Sample at 7.4-7.75 m.
7.75-8.1 m	Pea gravel and silty fine-textured **sand**, clasts are rounded to subrounded and polished limestone, some red and black shale clasts; gradational lower contact.
8.1-8.4 m	Brown silty medium-textured **sand**, minor pea gravel; gradational lower contact. Sample at 8.2-8.25 m.
8.4-9.25 m	Poor recovery; medium-fine- to fine-textured **sand;** gradational lower contact.
9.25-9.4 m	Brown medium-textured **sand**, massive, sharp lower contact. Sample at 9.25-9.4 m.
9.4-9.75 m	Silty fine-textured **sand**, heavy mineral streaking, ripples and cross-bedding. Sample at 9.6-9.7 m.

9.75-10.35 m	Brown silty very fine-textured **sand** to sandy silt; minor heavy mineral streaking; at 10.1 m three 3 to 5 cm beds of clay interbedded with silty very fine-textured sand; minor silt stringers; at base of this unit approximately 10% grits and granules, dropstones; sharp lower contact. Sample at 10.25-10.3 m.
10.35-10.75 m	Brown medium-fine-textured **sand**, minor heavy mineral streaking. Sample at 10.55-10.65 m.
10.75-11.05 m	Brown medium-textured **sand**, minor silt; sharp lower contact. Sample at 10.75-11.0 m.
11.05-11.35 m	Brown silty medium-fine- to fine-textured **sand**; sharp lower contact.
11.35-11.53 m	Brown medium-textured **sand**, minor silt, minor heavy mineral streaking; sharp lower contact.
11.53-11.70 m	Brown to red-brown **silt**; between 11.53 and 11.55 m silt is deformed, then brown sandy silt, massive; gradational lower contact.
11.7-12.25 m	Brown silty medium-textured **sand**, heavy mineral streaking, minor ripples and cross-bedding. Sample at 11.75-12.25 m.
12.25-13.75 m	Brown silty medium-textured **sand**, minor silt, some ripples and cross-bedding, heavy mineral streaking, minor grits and granules. Sample at 12.5-13.25 m.
13.75-14.10 m	Pale grey medium-fine- to fine-textured **sand**, minor silt; minor ripples, cross-bedding and heavy mineral streaking; red granules throughout; sharp lower contact. Sample at 13.85-13.95 m.
14.10-14.25 m	Pale grey silty very fine-textured **sand** to sandy silt; minor medium-fine-textured sand lenses; subrounded limestone pebble at 14.10 m (1 cm in diameter); sharp lower contact.
14.25-14.7 m	Red-brown sandy silt to clayey **silt**, minor silt laminae; dark grey silty clay bed at 14.50-14.51 m, deformed with minor black grits; gradational lower contact. Sample at 14.35-14.4 m.
14.7-16.75 m	Poor recovery; pale grey, with reddish hue, silty very fine-textured **sand** to sandy silt; highly deformed. Sample at 15.25-16.75 m.
16.75-17.10 m	Brown with reddish hue, silty very fine-textured **sand**, reddish clay intraclasts; deformed clayey silt and silt bed at 17.05 m, rip-up and drop clasts; sharp lower contact. Sample at 16.8-17.0 m.
17.10-17.15 m	Brown with reddish hue silty fine- to medium-fine-textured **sand**, minor beds of medium-fine sand; sharp lower contact.
17.15-17.35 m	Brown with reddish hue medium-fine-textured **sand**, ripples and cross-bedding, minor heavy mineral streaking; sharp lower contact.
17.35-17.6 m	Brown with reddish hue sandy **silt** to silty very fine-textured sand, ripples and cross-bedding, minor heavy mineral streaking, many grey and red clay granules and clast dropstones, rip-up clasts and ice-rafted debris; sharp lower contact. Sample at 17.4-17.5 m.
17.6-18.25 m	Brown with reddish hue very fine-textured **sand**, minor silt, ripples and cross-bedding, minor heavy mineral streaking; gradational lower contact.
18.25-18.45 m	Brown with reddish hue silty very fine-textured **sand**; sharp but deformed lower contact.
18.45-22.75 m	Interbeds of silty very fine-textured **sand**, with heavy mineral streaking and ripples, cross-bedding, and reddish brown clayey silt; beds are deformed, clayey silt is pulled into sand beds and vice versa; at 18.75 m many grits and granules up to pea gravel in size, ice-rafted debris; red shale granules observed; syndepositional deformation; clayey silt beds

	at 21.25 m, 21.3 m, 24.4 m, 21.5 m, 21.7 m, 22.0 m; debris-rich (red and grey clay intraclasts) silty very fine-textured sand at 21.35 m; fines at 22.25 m to silty very fine-textured sand; grey clay intraclasts; gradational lower contact. Sample at 18.72-18.8 m, 20.6-20.7 m, 21.0-21.05 m, 22.0-22.05 m, 22.35-22.45 m.
22.75-23.2 m	Grey-brown silty very fine-textured **sand**; deformed ripples and cross-bedding; heavy mineral streaking; red-brown and grey clay inclusions; sharp but faulted lower contact. Sample at 23.3-23.35 m.
23.2-23.25 m	Brown clayey **silt** interbedded with grey silty very fine-textured sand; deformed; minor grits in silty sand; sharp lower contact.
23.25-23.5 m	Brown with reddish hue silty to clayey **silt**; silt and grits at 23.45 m dipping and deformed; grey clay grits throughout; gradational lower contact.
23.5-23.8 m	Brown with red hue silty very fine-textured **sand**; ripples and cross-bedding; heavy mineral streaking; some red-brown silt laminae; grey and red-brown clay granules throughout and concentrations increase between 23.75 and 23.8 m; sharp lower contact. Sample at 23.7-23.75 m.
23.8-23.95 m	Red-brown to grey-brown clayey **silt** to silty clay; minor silt stringers, granules and pea gravel; gradational lower contact. Sample at 23.85-23.9 m.
23.95-24.25 m	Grey-brown silt, clayey **silt** and silty very fine-textured sand; deformed bedding; grits and granules throughout and red and grey clay granules throughout; gradational lower contact.
24.25-25.2 m	Grey-brown to brown with mauve hue clayey silt to silty very fine-textured sandy **diamicton**; compact; ~5-10% grits to 4 cm clasts, subangular to subrounded limestone; minor silt stringers; sharp lower contact. Sample at 24.25-24.7 m.
25.2-25.4 m	Grey-brown with reddish hue clayey **silt**; at 25.25 m pale grey silt with much grits and granules; pea gravel at the base of this unit; grey clay balls, inclusions; some horizontal silt stringers; sharp lower contact. Sample at 25.25-25.3 m.
25.4-25.7 m	Pale grey sandy **silt**; some deformed silty clay beds; minor black grits; grey and red clay inclusions; some deformation; sharp lower contact. Sample at 25.45-25.5 m.
25.7-25.75 m	Grey brown with reddish hue clayey **silt**; pale grey silt stringers, deformed; grey and red clay grits and inclusions; gradational lower contact.
25.75-26.0 m	Grey-brown with reddish hue silty very fine-textured **sand** to sandy silt diamicton; ~5-10% grits to pea gravel, subangular to subrounded limestone; silt stringers; compact; debris flow; gradational lower contact. Sample at 25.8-25.9 m.
26.0-26.5 m	Grey-brown with reddish hue massive sandy **silt**; minor grits; possible diamicton; gradational lower contact.
26.5-26.95 m	Grey-brown to tan sandy silt to clayey **silt** to silt; silt and silty clay interbeds are deformed; silt stringers; very minor grits and granules; sharp lower contact. Sample at 26.5-26.55 m.
26.95-27.25 m	Grey-brown **silt** and minor clayey silt beds; clast free; highly deformed; gradational lower contact.
27.25-28.0 m	Grey silt to sandy **silt**; medium-fine-textured sand beds at 27.6 m; minor grits and granules; gradational lower contact. Sample at 27.5-27.6 m.
28.0-29.0 m	Grey-brown sandy silt **diamicton**; very compact; ~10% grits to 5 cm clasts, subangular to subrounded limestone; possible debris flow; sharp lower contact. Sample at 28.0-28.25 m.

29.0-29.7 m	Grey-brown to red-grey-brown **silt** to clayey silt to silty very fine-textured sand beds; minor clay beds; highly deformed; minor grits and granules; silt stringers; sharp lower contact. Sample at 29.2-29.5 m.
29.7-30.25 m	Silty sandy **gravel**; limestone subrounded to rounded; gradational lower contact. Sample at 30.0-30.1 m.
30.25-31.75 m	Grey-brown with reddish hue to pale tan clayey **silt**, silty very fine-textured sand and silty fine-textured sand and silt; bedding is faulted and dipping; between 30.3 and 30.55 m many clay intraclasts, ice-rafted debris or rip-up clasts; at 31.0 m inclusion of interbedded clayey silt with many clay intraclasts, beds are faulted, completely different than remainder of the unit; silt beds, stringers; truncated beds; debris flow; post-depositional deformation; minor red clay clasts; becomes massive silt at 31.5 m; gradational lower contact. Sample at 30.6-30.7 m, 31.05-31.1 m.
31.75- 32.4 m	Grey-brown compact silty sand **diamicton**; ~5% grits and granules, limestone clasts; sharp lower contact.
32.4-32.7 m	Grey-brown **silt** to clayey silt; silt stringers; grits and granules; minor bedding; gradational lower contact.
32.7-33.9 m	Grey-brown silty sand **diamicton**; ~5% grits to pea gravel, limestone; compact; sharp lower contact. Sample at 32.8-32.85 m, 33.55-33.6 m.
33.9-34.0 m	Pale grey, massive sandy **silt**; very minor grits and granules; sharp but deformed lower contact.
34.0-34.45 m	Pale grey-brown compact sandy silt **diamicton**; ~10% grits to 5 cm clasts, subangular to subrounded limestone; gradational lower contact. Sample at 34.25-34.35 m.
34.45-34.75 m	Pea to 5 cm **gravel**; subangular to subrounded, most subangular, limestone with silty fine-textured sand matrix; gradational lower contact.
34.75-36.45 m	Grey-brown sandy silt to silty sand **diamicton**; ~5-10% grits to >10 cm clasts, most 1-2 cm, limestone; very compact, some siltier sections; possibly Catfish Creek Till; gradational lower contact. Sample at 35.25-35.35 m.
36.45-36.9 m	Grey-brown to red-brown to buff brown interbedded **silt**, clayey silt, and minor silty very fine-textured sand; deformed beds; 2 cm red shale clast at 36.55 m; silt stringers; faulted; sharp lower contact. Sample at 36.55-36.6 m.
36.9-37.15 m	Grey-brown clayey sandy silt **diamicton**; ~5-10% grits to 5 cm clasts, subangular to subrounded, limestone; silt and silty clay beds deformed at base of this unit; sharp lower contact. Sample at 37.0-37.05 m.
37.15-37.75 m	Grey-brown with reddish hue clayey **silt** to silt; interbedded with ice-rafted debris; silt stringers; red silty clay at 37.2 m; deformed beds; sharp but dipping lower contact. Sample at 37.25-37.3 m.
37.75-38.3 m	Pale grey-brown silt to silty very fine-textured **sand** to clayey silt; at 38.0 m and 38.1 m massive silt and clay beds; remainder has many grits to cobbles; red clay inclusions; drop clasts and ice-rafted debris; some granule beds at 38.25 m; sharp lower contact. Sample at 38.0-38.05 m.
38.3-40.0 m	Grey limestone **bedrock**; bituminous smell; striated at surface.

LP-MW-20-10

Location: 530274m E 4745570m N, NAD83, Zone 17
Screened Interval: 2.4-5.5 m, 13.7-15.2 m, 20.3-21.8 m

Depth	Description
0-0.25 m	Black **topsoil**; disturbed; deformed lower contact.
0.25-1.25 m	Brown medium- to coarse-textured **sand**; horizontal beds; minor silt laminae; minor organic soil inclusions between 0.25 and 0.5 m; some heavy mineral streaking; oxidized between 0.25 and 0.55 m; fines slightly at 1.05 m; gradational lower contact. Sample at 0.5-1.25 m.
1.25-2.0 m	Brown medium- to coarse-textured **sand**; highly deformed beds; soil laminae at 1.3 m and deformed inclusions of organic material between 1.25 and 1.75 m; gradational lower contact. Sample at 1.5-1.75 m.
2.0-3.2 m	Brown medium- to coarse-textured **sand**, much deformation, dewatering structures; some oxidized sections; inclusions of organic material between 2.2 and 2.55 m; very sharp lower contact; perhaps a discontinuity. Sample at 2.5-2.75 m.
3.2-3.5 m	Grey-brown clayey **silt** and silty very fine-textured sand beds and laminae; dewatering structures; some deformation; gradational lower contact. Sample at 3.25-3.5 m.
3.5-6.5 m	Grey-brown to tan with minor mauve hue silty **clay**, silt, silty very fine-textured sand, beds, laminae, stringers; some heavy mineral streaking; dewatering structures present in some sections; red clay drop clasts, rip-up clasts; minor dark grey clay laminae; sharp lower contact. Sample at 3.9-3.94 m, 5.75-5.8 m.
6.5-8.0 m	Brown medium-coarse- to coarse-textured **sand**; minor clay balls; minor pea gravel; gradational lower contact. Sample at 6.5-8.0 m.
8.0-9.5 m	Grey-brown medium-coarse-textured **sand**; limestone pebble at 8.05 m, subrounded and polished; gradational lower contact. Sample at 8.0-9.5 m.
9.5-11.0 m	Massive grey-brown medium- to medium-coarse-textured **sand**; some reddish sections; gradational lower contact. Sample at 9.5-11.0 m.
11.0-12.5 m	Grey-brown medium-textured **sand**; silty very fine-textured at 11.75-11.79 m and 11.95-12.0 m; many clay balls; limestone pebble at 11.8 m, subangular, overlain with very fine-textured sand; gradational lower contact. Sample at 11.2-11.5 m.
12.5-13.25 m	Grey-brown medium-textured **sand**; very minor horizontal laminae; fines to silt at base; sharp lower contact; unconformable lower contact. Sample at 12.75-12.8 m.
13.25-14.0 m	Brown medium-textured **sand**; ripples, cross-bedding, heavy mineral streaking; much deformation; gradational lower contact. Sample at 13.5-13.55 m.
14.0-15.5 m	Massive grey-brown silty very fine-textured **sand**; deformed grey clay ball at 14.6 m, ~2 cm in diameter; gradational lower contact. Sample at 14.75-14.8 m.
15.5-21.5 m	Grey-brown with mauve hue medium- to fine-textured **sand**; dewatering structures; deformed beds and laminae; heavy mineral streaking; minor coarse-textured sand beds; gradational lower contact. Sample at 15.5-17.0 m, 17.0-18.5 m, 18.5-20.0 m, 20.0-21.25 m.

21.5-23.0 m	Grey-brown with mauve hue silty very fine-textured **sand**; heavy mineral streaking, ripples, cross-bedding; clay laminae at 21.9-21.91 m; deformed coarse-textured sand beds at 22.35-22.36 m and 22.75 m; minor clay drop clasts; between 22.6 and 23.0 m, sediments are highly deformed; gradational lower contact. Sample at 22.45-22.5 m.
23.0-23.8 m	Grey-brown with mauve hue silty very fine-textured **sand** and sandy silt beds; deformed; medium-coarse-textured sand bed at 23.5 m 1-2 cm thick and subvertical; sharp but deformed lower contact. Sample at 23.3-23.35 m.
23.8-24.5 m	Grey-brown with mauve hue silty fine- to very fine-textured **sand** with deformed subvertical silt beds; dewatering structures; deformation; gradational lower contact.
24.5-26.00 m	Grey-brown with mauve hue silty very fine-textured **sand**; ripples cross-bedding and heavy mineral streaking at 24.5-24.6 m; minor silt stringers; minor dark grey clay stringers; 1 cm thick silty very fine-textured sand and clayey silt beds at 25.6-25.8 m; becomes massive clay at 25.9 m; gradational lower contact. Sample at 24.95-25.0 m.
26.0-27.5 m	Dark grey to grey-brown with mauve hue to pale grey-brown silty very fine-textured **sand**, sandy silt, clayey silt and silty clay; bands of silty clay and ice-rafted debris; ice-rafted debris scattered throughout; grits and granules; red clay balls; some deformation; some heavy mineral streaking; draping beds; gradational lower contact. Sample at 26.3-26.35 m.
27.5-29.0 m	Grey-brown with mauve hue very fine-textured **sand**, sandy silt, clayey silt and silty clay fining to sandy silt; red clay beds; dark grey clay beds; ice-rafted debris, red, dark grey and pale grey clay balls; some deformation; silt ball inclusions; some grits and granules; some horizontal beds; gradational lower contact. Sample at 28.5-28.53 m.
29.0-30.5 m	Grey-brown with mauve hue silty **clay**; some reddish laminae; silt stringers; minor silt drop clasts; some reddish clay balls; gradational lower contact. Sample at 29.5-29.55 m.
30.5-32.2 m	Grey-brown to dark grey **silt** to sandy silt to clayey silt to granular gravel; some horizontal silt and clay beds; red grit beds, ice-rafted debris; silt and clay stringers; limestone pebble at 31.25 m; some deformation; sharp lower contact. Sample at 31.3-31.35 m.
32.2-33.5 m	Grey-brown with mauve hue massive clayey silt **diamicton**; ~5% grits and granules, minor limestone pebbles; soft; gradational lower contact. Sample at 32.75-32.8 m.
33.5-34.5 m	Grey-brown with mauve hue silty **clay**; grits and granules; silt stringers and silt balls; silt laminae; deformed sections; sharp lower contact. Sample at 34.0-34.05 m.
34.5-36.9 m	Compact grey-brown with mauve hue sandy silt **diamicton**; ~5% grits and granules to cobbles, limestone; coarse-textured sand at 34.75 m; silt stringers; becomes very silty at 36.25 m; sharp lower contact. Sample at 34.55-34.6 m, 35.5-35.55 m, 36.7-36.75 m.
36.9-37.3 m	Grey-brown with mauve hue **silt**, sandy silt, and silty clay; red ice-rafted debris; clay grits and granules; silty clay laminae; sediment is deformed; some pebbles; gradational lower contact.
37.3-38.0 m	Grey-brown clayey **silt**; soft; ~5% grits and granules; silt stringers; clayey sections; gradational lower contact. Sample at 37.75-37.8 m.
38.0-38.5 m	Grey-brown sandy **silt**; grits to cobbles; remnants of diamicton.
38.5-40.0 m	Grey-brown with slight mauve hue compact sandy silt **diamicton**; ~5% grits, pebbles, subangular to subrounded limestone; gradational lower contact. Sample at 38.95-39.0 m, 39.75-39.8 m.
40.0-41.25 m	Dark grey to tan **clay**, silt, sandy silt, silty clay beds and stringers; some very gritty sections, ice-rafted debris; dipping slip faults; highly deformed sections; syndepositional

	deformation; red shale and clay intraclasts, drop clasts; gradational lower contact. Sample at 40.6-40.65 m.
41.25-44.5 m	Grey-brown with mauve hue sandy silt **diamicton**; till; ~10% grits to cobble, subangular to rounded, some polished, limestone; gradational lower contact. Sample at 43.25-43.3 m.
44.5-44.75 m	Grey-blue limestone and chert **bedrock** fragments; sharp lower contact. Sample at 44.2-44.25 m.
44.75-46.15 m	Grey-blue limestone **bedrock**; chert inclusions; black bituminous laminae.

LP-MW-21-10

Location: 535154m E 4741098m N, NAD83, Zone 17
Screened Interval: 2.4-6.1 m, 14.6-16.2 m

Depth	Description
0-0.2 m	Black **topsoil**; gradational lower contact.
0.2-0.35 m	Oxidized brown very fine-textured **sand**; some soil inclusions; gradational lower contact.
0.35-0.7 m	Oxidized brown silty fine- to very fine-textured **sand**; some unoxidized sections; some heavy mineral banding; gradational lower contact. Sample at 0.35-0.4 m, 0.55-0.6 m.
0.7-0.75 m	Black **soil** horizon; silty fine- to medium-fine-textured sand; undulating but sharp lower contact.
0.75-1.5 m	Oxidized brown silty fine- to medium-fine-textured **sand**, fining downward to sandy silt; organic fragments intermittently throughout; at base of this unit, evidence of an additional soil horizon; gradational lower contact. Sample at 0.9-1.0 m.
1.5-3.0 m	Pale reddish-brown silty very fine-textured **sand**, some greyish sections; dewatering structures, and irregular beds between 1.5 and 2.0 m; minor medium-fine-textured sand inclusions, ~1 cm in diameter; sediments grades into pale grey brown at 2.25-2.3 m; minor grits and granules throughout; gradational lower contact. Sample at 1.5-2.0 m, 1.95-2.25 m.
3.0-4.5 m	Brown silty fine- to very fine-textured **sand**; between 3.0 and 3.25 m dark grey to pale grey; oxidized clast at 3.10 m; heavy mineral streaking at 3.25-3.3 m; deformed beds, and silt balls throughout at 3.3-3.6 m; red shale clast at 3.4 m ~2 cm in diameter; grits and granules scatted throughout; at 3.75 ~3 cm inclusion of silty fine- to medium-fine-textured sand with grits and granules; gradational lower contact. Sample at 3.0-3.25 m, 3.25-4.1 m.
4.5-5.0 m	Pale brown silty very fine-textured **sand**; at 4.6 m, 4.75 m, and 4.9 m beds of silty fine-textured sand, minor silt, two lowermost beds are dipping; minor heavy mineral streaking; grits and granules throughout; at the base of the silty fine-textured sand bed at 4.9 m ~0.5 cm bed of clayey silt, deformed and dipping but conforming to overlying sand bed; silt stringers intermittent throughout, and deformed; dewatering structures; sharp lower contact. Sample at 4.5-5.0 m.
5.0-6.0 m	Pale grey medium-fine-textured **sand**, minor silt; heavy mineral banding, some cross-bedding; some oxidized beds; very minor granules; some red grits; gradational lower contact. Sample at 5.0-5.9 m.
6.0-6.75 m	Pale brown medium fine-textured **sand**, minor silt; some horizontal heavy mineral streaking; minor pale brown medium-fine-textured sand beds; some horizontal and deformed beds; sands become structureless between 6.5 and 6.75 m; gradational lower contact. Sample at 6.0-6.75 m.
6.75-7.5 m	Grey-brown silt, minor very fine-textured **sand**; deformed bedding; some mildly oxidized sections; coarsens to pale grey silty very fine-textured sand between 6.95 and 7.0 m; some heavy mineral streaking, minor oxidization; deformed lower contact. Sample at 6.75-7.0 m.
7.5-9.0 m	Brown medium-textured **sand**, minor fine-textured sand and silt; discontinuous grey silt bed at 7.75 m; minor silt stringers; otherwise massive; gradational lower contact. Sample at 7.5-8.75 m.

9.0-10.5 m	Brown medium-textured **sand**, minor fine-textured sand and silt; minor heavy mineral streaking; limestone pebble at 9.15 m ~2 cm diameter; gradational lower contact. Sample at 9.0-9.3 m, 9.3-9.5 m.
10.5-10.6 m	Pale grey medium-fine-textured **sand**, minor silty sand; heavy mineral streaking; red sand grains; sharp lower contact. Sample at 10.5-10.6 m.
10.6-10.7 m	Pale brown medium-fine-textured **sand**; at 10.6 m discontinuous dark grey silty clay bed, 0.5 cm thick; this unit denser than that above or below it; gradational lower contact. Sample at 10.6-10.7 m.
10.7-12.0 m	Pale grey medium-fine-textured **sand**; minor heavy mineral streaking; minor clasts, less than 1 cm diameter, dark grey rounded and polished limestone; gradational lower contact. Sample at 10.7-11.2 m.
12.0-13.5 m	Pale brown medium-fine-textured **sand**; minor heavy mineral streaking; very minor grey silt stringers; at 12.6 m reddish brown silt bed, ~2 cm thick, overlying 1 cm pale grey silt bed with undulating lower contact; sands become siltier below this; deformed heavy mineral banding; oxidized bed at 12.8 m; reddish brown streak observed at 12.75 m; minor silt stringers; gradational lower contact. Sample at 12.0-12.25 m, 12.6-12.63 m.
13.5-14.3 m	Pale brown medium-fine-textured **sand**, minor silt; heavy mineral streaking at 14.0 m; blocks of very fine-textured sand within heavy mineral bands; gradational lower contact. Sample at 13.95-14.05, 14.1-14.2 m.
14.3-15.0 m	Pale brown silty very fine-textured **sand**; heavy mineral banding; some deformed pale grey silt beds and inclusions; some red granules; minor medium-textured sand; inclusions surrounded by pale grey silt; deformation between 14.5 and 14.75 m; gradational lower contact. Sample at 14.45-14.75 m.
15.0-16.75 m	Pale grey fine- to very fine-textured **sand**; minor silt stringers at base; massive; gradational lower contact. Sample at 15.0-16.25 m, 16.25-16.5 m.
16.75-18.0 m	Massive brown silty medium-fine-textured **sand**; minor silt stringers; heavy mineral streaking; pale grey silt bed at 17.3 m; gradational lower contact. Sample at 16.8-17.25 m, 17.25-17.4 m.
18.0-18.25 m	Pale grey silty fine-textured **sand**; minor silt beds; some heavy mineral banding; some deformation; minor oxidized granules; some red sand grains; sharp lower contact. Sample at 18.0-18.1 m.
18.25-18.35 m	Oxidized brown very fine-textured **sand**; some beds of medium-fine-textured sand; red and black sand grains; deformed lower contact.
18.35-18.5 m	Pale grey deformed beds of medium-fine- and very fine-textured **sand**; some red sand grains; fines to silty very fine-textured sand at base; deformed irregular lower contact. Sample at 18.3-18.5 m.
18.5-18.75 m	Pale grey silty very fine-textured **sand**; minor grey silt beds, deformed; minor medium-fine-textured sand inclusions; sharp lower contact. Sample at 18.55-18.7 m.
18.75-18.95 m	Grey **silt**; minor pale grey and dark grey streaks; sharp lower contact. Sample at 18.8-18.95 m.
18.95-19.10 m	Deformed beds of dark grey clayey **silt**, pale grey very fine-textured silty sand; heavy mineral banding; dark grey granules; sharp lower contact.
19.10-19.5 m	Pale grey **silt** with minor very fine-textured sand; at 19.3 m ~3 cm thick bed of deformed dark grey silty clay; clay inclusions in silt; potential drop clasts less than 0.5 cm diameter; gradational lower contact. Sample at 19.15-19.3 m.

19.5-21.0 m	Pale grey silty very fine-textured **sand**; dewatering structures; dark grey silt beds, deformed and discontinuous; at 20.20 m deformed dark grey clay bed; some minor silt stringers; some very fine-textured sand stringers, mildly oxidized; appears clast free; gradational lower contact. Sample at 19.5-20.15 m, 20.15-20.20 m.
21.0-21.15 m	Dark grey beds of silty **clay** and pale grey very fine-textured silty sand; at 21.0-21.15 m clay bed; sharp lower contact. Sample at 21.0-21.15 m.
21.15-21.2 m	Grey **silt** and silty clay beds, 1-2 cm thick and deformed; sharp lower contact.
21.2-21.35 m	Reddish grey **clay** with minor silt; rip-up clasts of silty very fine-textured sand; deformed lower contact.
21.35-21.5 m	Grey silty very fine-textured **sand**; minor clay inclusions; sharp lower contact. Sample at 21.35-21.45 m.
21.5-21.6 m	Reddish grey **clay** deformed with dark grey clay beds, ~1 cm thick; deformed lower contact. Sample at 21.55-21.65 m.
21.6-22.5 m	Grey silty very fine-textured **sand** with pale grey silt stringers; gradational lower contact.
22.5-22.75 m	Grey silty very fine-textured **sand**; deformed silt and clay stringers; at 22.7 m deformed bed of dark grey clay with granules; deformed lower contact. Sample at 22.5-22.75 m.
22.75-23.0 m	Pale grey to grey silty very fine-textured **sand**; deformed beds; gradational lower contact.
23.0-24.0 m	Pale grey silty very fine-textured **sand**; minor heavy mineral banding; mottled; deformed; dewatering structures; gradational lower contact. Sample at 23.25-23.5 m.
24.0-24.6 m	Pale brown silty very fine-textured **sand**; silt and minor clay beds, several millimetres to 1 cm; highly deformed; dewatering structures; some minor dark grey clay balls, ~0.5 cm diameter; at 24.5 m horizontal dark grey clay bed ~1 cm thick; sharp lower contact. Sample at 22.4.0-24.6 m.
24.6-26.4 m	Grey-brown with mauve hue silty **diamicton**; interbeds of tan silt laminae, some horizontal, some faulted and deformed; some minor red silt laminae; rip-up clasts and drop granules especially between 25.0 and 25.25 m; ice-rafted debris; deformed but sharp lower contact. Sample at 24.6-25.5 m, 25.5-26.4 m.
26.4-27.0 m	Pale grey-brown massive silty very fine-textured **sand**; minor silt stringers; gradational lower contact. Sample at 26.4-26.55 m.
27.0-27.25 m	Pale grey-brown clayey silt **diamicton**; some pale brown silt stringers; grits throughout; some fracture and deformed silt stringers; lowermost 50 cm appears dewatered; many silt stringers, deformation; and ice-rafted debris; sharp but faulted lower contact. Sample at 27.0-27.25 m.
27.25-28.5 m	Pale grey-brown silty very fine-textured **sand**; 5 cm deformed clay bed at 27.9 m; deformed silt and clay laminae; rip-up clasts; highly waterlogged environment; silt stringers, ice-rafted debris; minor red sandstone granules; minor pebbles up to 2 cm diameter, rounded and polished limestone; becomes more massive, fine- to medium-fine-textured sand at 28.2-28.4 m; gradational lower contact. Sample at 27.25-28.5 m.
28.5-29.15 m	Grey-brown silty very fine-textured **sand**; pale brown silt laminae; minor clay clasts; faulted and deformed; pebble at 29.0 m 2.5 cm diameter limestone; some rip-up clasts; minor faulted clayey silt beds; between 29.1 and 29.15 m silts and clayey silt bed; deformed; dewatering structures; sharp but deformed lower contact. Sample at 28.55-28.65 m.

29.15-29.65 m	Grey-brown clayey silt **diamicton**; minor red granules; grits and granules up to pebble 1-2 cm diameter, limestone; clayey silt at base; compact, dense; sharp lower contact. Sample at 29.25-29.35 m.
29.65-29.7 m	Pale grey-brown **silt** beds; minor clay stringers and laminae; dewatering structures; sharp lower contact.
29.7-30.0 m	Pale grey-brown silty medium-fine- to very fine-textured **sand**; gradational lower contact. Sample at 29.85-29.95 m.
30.0-31.5 m	Pale grey silty very fine-textured **sand**; minor horizontal silt laminae; At 30.3 m, 30.55 m, 30.85 m, 31.25 m, ~5 cm thick beds of dark grey clayey silt to clay rhythmites, faulted and deformed, sharp upper and lower contacts; matrix coarsens slightly at 31.0 m, decreased silt content; gradational lower contact. Sample at 30.25-30.35 m, 30.7-30.75 m, 31.35-31.4 m.
31.5-32.75 m	Pale grey-brown silty very fine-textured **sand** with very fine-textured sand laminae, deformed; clast free; faulted; reddish grey-brown clayey silt to silty clay rhythmites at 31.6 m, 31.8 m, 31.95 m, 32.2 m, 32.35 m, 32.45 m, some containing rip-up clasts, some faulting; grey clay clasts up to 1 cm diameter; rip-up clasts of underlying silty medium-fine-textured sand; deformed lower contact. Sample at 32.0-32.5 m, 32.35-32.4 m, 32.55-32.6 m.
32.75-33.0 m	Pale grey medium-fine-textured **sand**; minor silt; minor heavy mineral banding; gradational lower contact. Sample at 32.85-32.95 m.
33.0-35.0 m	Pale grey with reddish hue fine-textured **sand**; heavy mineral banding; ripples, cross-bedding; minor grits and granules; at 34.1 m red clay clast ~1 cm diameter; sharp lower contact. Sample at 33.0-34.5 m, 34.5-35.0 m.
35.0-39.0 m	Grey-brown with mauve hue clayey silt **diamicton**; ~10-20% grits to 3 cm clasts, limestone; very compact; minor red grits; minor silt stringers; gradational lower contact. Sample at 35.4-35.5 m, 36.6-36.7 m, 38.0-38.1 m.
39.0-39.4 m	Grey-brown with mauve hue clayey silt to **silt**; compact; minor grits and granules; silt stringers, faulted and deformed; clayey silt rip-up clasts; dewatering structures; gradational lower contact. Sample at 39.1-39.2 m, 39.35-39.45 m.
39.4-40.1 m	Grey-brown with mauve hue clayey silt **diamicton**; compact; grits and granules to 3 cm pebble limestone; minor silt stringers; minor clayey silt; gradational lower contact. Sample at 39.6-39.7 m, 40.0-40.05 m.
40.1-40.45 m	Grey-brown with mauve hue clayey silt to **silt**; compact; minor grits and granules; silt stringers, faulted and deformed; clayey silt rip-up clasts; dewatering structures; sharp lower contact. Sample at 40.1-40.2 m.
40.45-40.5 m	Grey **silt** to clayey silt; grits and granules; rip-up clasts; gradational lower contact. Sample at 40.45-40.5 m.
40.5-41.0 m	Grey-brown mauve hue clayey silt **diamicton**; very minor grits and granules; some silt stringers; sharp lower contact. Sample at 40.75-40.8 m.
41.0-42.0 m	Pale grey **silt**; some clay beds and stringers; highly faulted and deformed; very minor grits clay beds increase at 41.8 m; gradational lower contact. Sample at 41.25-41.3 m, 41.8-41.9 m.
42.0-43.25 m	Massive pale brown silty very fine-textured **sand**; silty clay to clayey silt rhythmites with silt beds and silt stringers at 42.2-42.3 m, 42.6-42.7 m, 42.9-42.95 m, 43.05-43.1 m; rip-up clasts, some grits and granules; silts are faulted; red shale clast at 42.9 m; minor

	heavy mineral streaking and ripples; gradational lower contact. Sample at 42.2-42.25 m, 42.45-42.5 m.
43.25-45.0 m	Grey-brown **silt** with minor very fine-textured sand; clayey silt to silty clay beds with grits, granules, red clay beds, deformed, rip-up clasts and silt stringers (rhythmites) at; 43.6-43.7 m, 44.0-44.35 m, 44.45-44.47 ml gradational lower contact. Sample at 43.25-43.35 m, 43.75-13.85 m, 44.1-44.15 m, 44.65-44.7 m, 44.85-44.9 m.
45.0-45.5 m	Pale brown silty very fine-textured **sand**; minor clay grits; faulted, rippled and deformed; minor red shale granules; clay between 45.2 m and 45.35 m, at the top, red clay bed interbedded with silt; highly faulted and deformed, grey and red granules; sharp lower contact.
45.5-46.5 m	Red grey **clay**; silt interbeds and laminae; highly deformed; rip-up clasts; dewatering structures; some red shale pebbles ~1 cm diameter; red clay beds throughout; gradational lower contact. Sample at 45.5-45.55 m, 45.95-45.6 m.
46.5-49.5 m	Mauve grey to pale grey **clay**, silt silty clay and silty very fine-textured sand beds, laminae and stringers; highly deformed in some areas; subhorizontal but faulted in other parts; rip-up clasts; dewatering structures; inverted beds; grits and granules throughout; some red sandstone granules and small pebbles; at 47.05-47.10 m grit and granule-rich clayey silt; red clay granules and rip-up clasts; lowermost 1 m is rhythmically bedded clay spaced ~5 cm apart; gradational lower contact. Sample at 46.6-46.65 m, 47.05-47.1 m, 48.3-48.35 m, 49.15-49.2 m.
49.5-49.55 m	Grey silty very fine-textured **sand**; dewatering structures; some drop clasts; deformed lower contact.
49.55-49.6 m	Grey-brown silty very fine- to fine-textured **sand**; >10% grits to 1 cm clasts; deformed lower contact. Sample at 49.55-49.6 m.
49.6-49.9 m	Grey-brown with mauve hue silty **clay**, silt; some horizontal bedding and laminae; beds are deformed; grits and granules; some drop clasts; at 49.75 m, granite clast 2-3 cm subangular; sharp but faulted lower contact.
49.9-50.5 m	Grey-brown with mauve hue compact clayey **silt**; ~5% grits and granules; minor silt stringers and massive clayey silt beds; deformed; dewatering structures; gradational lower contact. Sample at 49.95-50.05 m, 50.45-50.55 m.
50.5-50.55 m	Grey-brown to red-brown **clay**; grey clay intraclasts; very minor grit and granules; deformed lower contact.
50.55-50.95 m	Grey-brown silty **clay** to clayey silt; silt and clay beds, stringers; deformed; ~5% grits and granules; at 50.70 m grits and granules content increases and matrix coarsens to very fine- to medium-fine-textured sand; sharp lower contact.
50.95-51.0 m	Grey brown **silt**, clay, and very fine-textured sand; ~10% grits and granules; gradational lower contact.
51.0-51.75 m	Grey-brown with mauve hue; clayey **silt**; minor silt stringers and laminae; very minor grits and granules, some red granules observed; gradational lower contact. Sample at 51.2-51.25 m, 51.75-51.85 m.
51.75-51.9 m	Compact grey-brown silty clay **diamicton**; ~5-10% grits to 2 cm pebbles, limestone; gradational lower contact.
51.9-51.95 m	Grey-brown clayey **silt**; sharp lower contact.
51.95-52.0 m	Compact grey-brown silty clay **diamicton**; ~5-10% grits to 2 cm pebbles, limestone; gradational lower contact.

52.0-52.5 m	Grey-brown silt to clayey **silt**; 1 cm thick clay beds observed; minor silt beds; clast free; some deformed beds, dewatering structures; gradational lower contact. Sample at 52.15-52.25 m.
52.5-55.0 m	Grey-brown clayey **silt**; minor grits and granules; silt beds; silt stringers; faulting and deformation; fines slightly at 53.75 m to grey clay and fewer grits and granules; gradational lower contact. Sample at 52.9-53.0 m, 53.75-53.85 m, 54.35-54.45 m.
55.0-55.7 m	Grey-brown with mauve hue silty **clay**; ~5% grits and granules; gradational lower contact. Sample at 55.1-55.2 m, 55.55-55.6 m.
55.7-55.75 m	Grey-brown with mauve hue sandy silty **clay**; ~5-10% grits and granules; sharp lower contact. Sample at 55.7-55.75 m.
55.75-55.8 m	Grey-brown with mauve hue silty **clay**; sharp but deformed lower contact.
55.8-56.0 m	Grey-brown with mauve hue sandy silty **clay** to clayey silt; rip-up clasts at base; sharp but deformed lower contact.
56.0-56.25 m	Grey-brown with mauve hue silty **clay**; deformed lower contact.
56.25-56.5 m	Grey to dark grey to pale grey to red-grey-brown beds of clayey **silt** to silty clay to sandy clay silt; ice-rafted debris, rip-up clasts; deformation, dewatering structures; gradational lower contact. Sample at 56.35-56.45 m.
56.5-57.0 m	Grey-brown with mauve hue silty **clay**; minor silt stringers and lenses; sediment is deformed; sharp lower contact. Sample at 56.75-56.85 m.
57.0-57.2 m	Pebble **gravel**, silty sandy, silty clayey to clayey silt matrix; clasts are up to 4 cm in diameter, subrounded to rounded and polished limestone; sharp lower contact.
57.2-58.5 m	Grey-brown with mauve hue clayey silt **diamicton**; up to 10% grits and granules; minor pebbles; massive; sandier section at 57.7 -57.75 m; limestone clasts; polished and striated; red clay grits; gradational lower contact. Sample at 57.3-57.35 m, 58.1-58.2 m.
58.5-61.5 m	Compact pale grey brown to tan clayey silt **diamicton**; ~10% grits and granules; gradational lower contact. Sample at 58.6-58.7 m, 59.1-59.2 m, 60.35-60.45 m.
61.5-61.6 m	Grey-brown with mauve hue silty **clay**; minor grits and granules; sharp lower contact. Sample at 61.6-62.85 m.
61.6-62.85 m	Massive grey-brown with mauve hue medium- to medium-fine-textured **sand**, minor silt; gradational lower contact.
62.85-63.0 m	Massive grey-brown with mauve hue silty **clay**; minor grits and granules; gradational lower contact. Sample at 62.9-63.0 m.
63.0-64.55 m	Grey-brown with mauve hue clayey silt to sandy clayey silt **diamicton**; ~10-15% grits to cobble gravel, subrounded to rounded and polished; sharp lower contact. Sample at 63.0-63.75 m.
64.55-66.0 m	Pale grey to grey limestone **bedrock**; some chert inclusions.

LP-MW-22-10

Location: 548077m E 4747497m N, NAD83, Zone 17
Screened Interval: 2.1-5.2 m, 13.0-14.5 m, 48.5-50.0 m

Depth	Description
0-0.25 m	Brown sandy pebbly **topsoil**; gradational lower contact.
0.25-1.15 m	Loose grey-brown medium-textured **sand**; ~5-10% gravel, 2 -5 cm diameter; subrounded to rounded limestone; sharp lower contact. Sample at 0.5-0.55 m.
1.15-1.19 m	Disturbed black **topsoil**; mollusc shells observed; sharp lower contact.
1.19-1.25 m	Grey sandy **silt**; minor clay, minor grits; deformed lower contact.
1.25-1.3 m,	Clean grey medium-textured **sand**; deformed lower contact.
1.3-2.0 m	Grey silty fine- to very fine-textured **sand**; minor oxidized sections; heavy mineral streaking; organic material observed; gradational lower contact. Sample at1.5-1.55 m.
2.0-2.35 m	Grey-brown fine- to very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; at 2.1 and 2.15 m highly deformed soil horizons; sharp lower contact.
2.35-2.5 m	Grey-brown medium-fine- to fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; sharp lower contact. Sample at 2.45-2.5 m.
2.5-5.75 m	Grey-brown medium- to medium-coarse-textured **sand**; ripples, cross-bedding and heavy mineral streaking; some fine- to very fine-textured sand beds and laminae; gradational lower contact.
5.75-7.25 m	Brown medium- to medium-fine-textured **sand**, minor silt; ~5% gravel 2-5 cm diameter, subrounded to rounded and polished, limestone; some silt balls; gradational lower contact. Sample at 6.5-6.55 m.
7.25-7.55 m	Massive grey-brown coarse-textured **sand**; grey clay ball at 7.55 m, 1-2 cm diameter; sharp lower contact. Sample at 7.45-7.5 m.
7.55-22.6 m	Grey-brown silty very fine-textured **sand** to sandy silt; reddish silt laminae and beds; some very fine-textured sand laminae; dark grey brown and red clay rhythmites at 7.5 m, 8.0 m, 8.2 m, 8.4 m, 8.97 m, 9.4 m, 9.65 m, 9.8 m, 9.95 m, 10.05 m, 10.3 m, 10.65 m, 10.85 m, 11.05 m, 11.2 m, 11.5 m, 12.0 m, 12.6 m, 12.7 m, 13.3 m, 13.7 m, 14.6 m, 16.05 m, 16.25 m, 17.1 m, 18.45 m, 19.2 m, 19.5 m, 20.25 m, 20.4 m, 21.3 m, 21.5 m, 21.75 m, 22.25 m, 1-4 cm thick; some heavy mineral streaking, ripples and cross-bedding; minor drop clast beds; red shale at 9.5 m; minor rip-up clasts; highly deformed at 11.75 m; coarsening to fine-textured sand at 14.35 m; limestone pebble subrounded and polished at 19.55 m, and 20.35 m; red silt ball at 21.55 m, gradational lower contact. Sample at 7.75-7.8 m, 9.25-9.3 m, 10.75-10.8 m, 12.25-12.3 m, 14.0-14.05 m, 15.25-15.3 m, 17.0-17.05 m, 18.75-18.8 m, 19.75-19.8 m, 21.45-21.5 m.
22.6-23.75 m	Grey-brown with mauve hue **silt**, clayey silt, and silty very fine-textured sand beds; rip-up and drop clasts; gradational lower contact. Sample at 22.75-22.8 m.
23.75-24.9 m	Grey-brown with mauve hue clayey **silt** to silty clay; grey clay intraclasts; silt laminae; sediment is highly deformed; red clay drop clasts; deformed lower contact. Sample at 24.15-24.2 m.

24.9-25.25 m	Pale grey with mauve hue silty very fine-textured **sand** and clayey silt beds; ice-rafted debris; red clay intraclasts; gradational lower contact. Sample at 25.0-25.05 m.
25.25-26.75 m	Grey-brown with mauve hue silty **clay**; some red beds and laminae; subvertical silt beds faulted between 25.85 and 26.35 m; becomes silty at 26.35 with clayey silt beds; folded and faulted; gradational lower contact. Sample at 26.0-26.05 m.
26.75-27.0 m	Grey-brown with mauve hue silty **clay**; silt laminae; ice-rafted debris; dark brown clay bed; at base of this unit red and grey clay balls, rip-up and drop clasts; gradational lower contact.
27.0-27.55 m	Pale grey-brown with mauve hue silty very fine-textured **sand**; minor heavy mineral streaking; reddish clay laminae and bedding; red shale clasts; minor rip-up clasts; highly faulted and deformed; sharp lower contact. Sample at 27.15-27.2 m.
27.55-28.25 m	Grey-brown with mauve hue clayey **silt** to silty clay; horizontal silt laminae and beds; some deformed silt beds; some normal faulting; some beds drawn into underlying beds; gradational lower contact.
28.25-31.25 m	Grey-brown with mauve hue silty **clay**; silt laminae; minor red clay beds and laminae; some deformation; silty clay is massive; minor laminae of silt and clay rip-up and drop clasts; at 30.15-30.2 highly deformed silt beds; at 31.0 m red, pale and dark grey clay balls, ice-rafted debris, red shale granules to 1 cm diameter; gradational lower contact. Sample at 28.75-28.8 m, 30.5-30.55 m.
31.25-33.25 m	Grey-brown with mauve hue silty **clay**; horizontal silt and dark grey clay laminae at 31.4-31.5 m, 31.7-31.75 m, with drop clasts and clay inclusions; silty clay is massive; massive debris-rich bands, containing red shale, grits and silt inclusions at 31.85-32.0 m, 32.05-32.1 m, 32.17-32.3 m, and 32.45-32.75 m; sharp lower contact. Sample at 32.25-32.3 m, 33.0-33.05 m.
33.25-34.25 m	Grey-brown silty **clay**; debris-rich beds at 33.5-33.53 m, and 33.95-34.0 m; silt and clay stringers; gradational lower contact. Sample at 34.05-34.08 m.
34.25-35.75 m	Grey-brown with mauve hue silty **clay**; some pale grey clay balls; rip-up clasts; some grits and granules, red shale grits; minor dipping and horizontal colour banding; silt stringers; gradational lower contact. Sample at 34.75-34.8 m.
35.75-36.25 m	Grey-brown with mauve hue silty **clay** to clayey silt to silt beds, stringers and laminae; highly deformed at 36.2-36.25 m; minor grits and granules; gradational lower contact. Sample at 35.95-36.0 m.
36.25-36.35 m	Pale grey clayey **silt**; many grits to pebbles; minor silt laminae; remnant of a diamicton block; gradational lower contact.
36.35-36.45 m	Grey to pale tan **silt**, clayey silt and silty clay beds and laminae; sharp lower contact.
36.45-39.25 m	Tan compact and massive sandy silt **diamicton**; till; ~5% grits to 5 cm pebbles; subangular to subrounded limestone; some polished and striated; gradational lower contact. Sample at 36.5-36.6 m, 37.7-37.75 m.
39.25-40.25 m	Pebble to cobble **gravel**; subangular to subrounded limestone; clayey silt and silty clay caps on clasts; some silt clay beds but highly deformed; diamicton at 39.5-39.6 m; gradational lower contact. Sample at 39.6-39.7 m.
40.25-41.75 m	Grey-brown to pale grey with mauve hue clayey **silt**, silty clay, silt laminae beds and stringers, some deformation; gradational lower contact. Sample at 40.75-40.8 m.

41.75-44.75 m	Grey-brown with mauve hue to tan clayey **silt**, silty clay and silt beds, laminae and stringers; some horizontal beds, some highly faulted and folded; limestone pebble at 43.8 m; gradational lower contact. Sample at 42.0-42.05 m, 43.95-44.0 m.
44.75-45.0 m	Grey-brown with mauve hue silty **clay**; grits and granule to pebbles; many red shale clasts; sharp lower contact. Sample at 44.85-44.9 m.
45.0-45.1 m	Dark grey-brown silty **clay**; minor silt stringers; pale grey rip-up clasts; sharp lower contact.
45.1-45.25 m	Tan **silt** and clayey silt beds, laminae; highly deformed; sharp lower contact.
45.25-48.0 m	Pebble to cobble **gravel**; subangular to subrounded, polished and striated limestone; silty clay and sandy silt matrix; possible **diamicton**; sharp lower contact.
48.0-49.0 m	Pale grey-blue limestone **bedrock**; some fossiliferous sections; black speleothems; some chert sections.

LP-MW-23-10

Location: 516038m E 4749508m N, NAD83, Zone 17
Screened Interval: 3.0-6.1 m

Depth	Description
0-0.2 m	Black sandy **topsoil**; gradational lower contact.
0.2-0.5 m	Oxidized orange-brown silty very fine-textured sandy **topsoil**; grits and granules; sharp lower contact.
0.5-0.75 m	Tan brown loose fine- to very fine-textured **sand**; clean, minor silty laminae at 0.75 m; gradational lower contact. Sample at 0.5-0.6 m.
0.75-0.8 m	Oxidized brown silty very fine-textured **sand**; sharp lower contact.
0.8-1.1 m	Mildly oxidized brown silty fine-textured **sand**; some mottling; minor silt stringers; sharp lower contact. Sample at 0.9-1.0 m.
1.1-1.45 m	Oxidized brown **silt** and silty very fine-textured sand beds, stringers and laminae; deformed; sharp lower contact. Sample at 1.25-1.35 m.
1.45-2.5 m	Grey-brown silty very fine-textured **sand** to sandy silt; massive; gradational lower contact.
2.5-2.75 m	Grey-brown sandy silt **diamicton**; grits and granules; silt stringers; sharp lower contact. Sample at 2.7-2.75 m.
2.75-3.25 m	Grey-brown silty very fine-textured sand; sharp lower contact.
3.25-4.75 m	Grey-brown with mauve hue beds of sandy **silt**, silty very fine-textured sand and very fine-textured sand; faulting, rip-up blocks of ripple and cross-bedded very fine-textured sands; silty clay balls, rip-up clasts and blocky inclusions; silty clay bed at 4.27-4.3 m; normal faults; some deformation of underling beds; loading structures; gradational lower contact. Sample at 3.9-4.0 m.
4.75-5.15 m	Grey-brown with mauve hue silty very fine-textured **sand**; highly disturbed ripples and cross-bedding; some heavy mineral streaking; mauve tint strengthens at 5.0 m; sharp lower contact. Sample at 5.0-5.05 m.
5.15-5.2 m	Grey-brown silty **clay**; rip-up sections of underlying sands; grits to pebbles, subrounded limestone; deformed and faulted lower contact.
5.2-6.0 m	Grey-brown with mauve hue fine- to very fine-textured **sand**; some horizontal heavy mineral streaking, many are faulted; at 5.7-5.72 m dark grey-brown with mauve hue silty clay bed, dipping; sharp but dipping lower contact.
6.0-6.25 m	Massive dark grey-brown with mauve hue silty clayey **diamicton**; ~5% grits and granules, limestone; gradational lower contact. Sample at 6.05-6.1 m.
6.25-7.15 m	Grey-brown with mauve hue fine-textured **sand**; between 6.35 and 6.55 m thick heavy mineral beds, normal faulting; slumping and deformation; at 6.9-6.95 m heavy mineral streaking with grits and granules; gradational lower contact. Sample at 6.5-6.55 m.
7.15-7.45 m	Massive grey-brown with mauve hue very fine-textured **sand**; deformed lower contact, underlying silts and clays pulled up into this unit; gradational lower contact. Sample at 7.2-7.25 m.

7.45-7.75 m	Dark grey-brown with mauve hue silty **clay**; grits and granules; silt caps on granules; gradational lower contact.
7.75-8.55 m	Massive grey-brown with mauve hue silty clay **diamicton**; ~5% grits and granules; silt stringers; red shale granules; at 8.25 m sand silty clay and pebble bed; deformed lower contact including rip ups of underlying sand. Sample at 8.0-8.05 m.
8.55-8.75 m	Grey-brown medium-fine-textured **sand**; some silt stringers; oxidized laminae; gradational lower contact. Sample at 8.65-8.7 m.
8.75-9.25 m	Massive grey-brown with mauve hue sandy silt to silty very fine-textured sandy **diamicton**; soft; silt stringers; gradational lower contact.
9.25-15.95 m	Massive grey-brown with mauve hue silty clay **diamicton**; ~5% grits to pebble gravel; subangular to subrounded limestone; red grits; Port Stanley Till; sharp lower contact along a shear plane. Sample at 10.0-10.05 m, 11.0-11.05 m, 13.25-13.3 m, 14.5-14.55 m, 15.45-15.5 m.
15.95-19.75 m	Pale grey to dark grey with mauve hue **silt**, clayey silt and silty clay beds; sheared, faulted, ripped up and deformed; very minor grits and granules; deformed clayey silt to silty clay beds at 18.00 m; gradational lower contact. Sample at 16.5-16.55 m, 17.45-17.5 m, 19.05-19.15 m.
19.75-20.8 m	Grey-brown to tan-brown silty **clay**, clayey silt and silt beds; sheared, faulted, and deformed; between 20.5 and 20.8 m silty clay and silt rhythmites, beds are faulted, at least 7 sets; limestone cobble at 20.75 m; gradational lower contact. Sample at 20.5-20.55 m.
20.8-21.25 m	Grey-brown clayey silt to sandy silt **diamicton**; 10-15% grits to pebble gravel, subangular to subrounded, limestone; at 20.95-20.99 m siltier clast-free bed capped with red ice-rafted debris (perhaps flow till); very minor red clasts, fewer than overlying till unit. Sample at 21.05-21.55 m.
21.25-21.6 m	Grey-brown with mauve hue clayey **silt**, silt and silty clay beds and laminae; ice-rafted debris; gradational lower contact. Sample at 21.45-21.5 m.
21.6-22.75 m	Massive grey-brown sandy silt **diamicton**; 10-15% grits to pebble, subangular to subrounded, limestone; silt beds at 21.8-21.85 m and 22.0-22.4 m; rare red granules; limestone cobbles at the base of this run; Catfish Creek Till; gradational lower contact. Sample at 22.25-22.3 m.
22.75-24.25 m	Grey-brown sandy silt **diamicton**; limestone, angular to subangular; some black limestone; bituminous smell; much of the matrix removed through drilling. Sample at 23.3-23.35 m.
24.25-24.75 m	Grey-brown with reddish hue compact sandy silt **diamicton**; grits to pebbles, limestone; Catfish Creek Till, flow till; gradational lower contact. Sample at 24.45-24.5 m.
24.75-24.85 m	Dark grey-brown sandy **silt**; minor grits and granules; sharp lower contact.
24.85-25.2 m	Grey-brown disturbed beds of sandy **silt** and silty very fine-textured sand; minor clay; minor grits and granules; sharp lower contact.
25.2-25.75 m	Grey-brown **silt**; massive; minor grits; some deformed dark grey pale grey silt to clayey silt laminae; faulted; gradational lower contact. Sample at 25.45-25.5 m.
25.75-26.7 m	Grey-brown to dark grey to pale grey interbedded **silt**, silty very fine-textured sand and clayey silt laminae; faulted, deformed; sharp but deformed lower contact. Sample at 26.2-26.25 m.

26.7-27.0 m	Compact grey-brown sandy silt **diamicton**; silt bed at 26.8 m; grits to 3 cm, limestone; till; gradational lower contact. Sample at 26.9-26.95 m.
27.0-43.9 m	Massive and compact grey-brown sandy silt **diamicton**; ~5-10% grits to 5 cm, subangular to subrounded limestone; becomes siltier and clast content decreases at 27.5 m; red shale grits throughout; clast content decreases and silt clay content increases between 39.25 and 40.25 m; matrix coarsens slightly at 40.75 m; gradational lower contact. Sample at 27.95-28.0 m, 29.45-29.5 m, 31.0-31.05 m, 32.5-32.55 m, 33.95-34.0 m, 35.5-35.6 m, 36.75-36.8 m, 38.7-38.75 m, 39.5-39.55 m, 41.25-41.3 m, 42.0-42.05 m, 43.0-43.05 m, 43.85-43.9 m.
43.9-44.3 m	Grey-brown with mauve hue clayey **silt**; gradational lower contact.
44.3-44.9 m	Grey-brown with mauve hue clayey **silt** and sandy silt beds; beds are dipping and deformed; sharp lower contact.
44.9-45.25 m	Grey-brown with mauve hue massive **silt**; gradational lower contact. Sample at 45.0-45.05 m.
45.25-45.75 m	Grey-brown with mauve hue clayey **silt**; silt laminae; sharp lower contact.
45.75-46.05 m	Massive grey-brown **silt** with mauve hue; gradational lower contact. Sample at 45.8-45.85 m.
46.05-46.75 m	Grey-brown with mauve hue clayey **silt**; silt laminae; gradational lower contact. Sample at 43.35-46.45 m.
46.75-48.8 m	Dark grey-brown clayey **silt**; pale grey-brown silt stringers, subhorizontal to dipping and faulted; some red shale grits; grits and granules randomly throughout; clay rip-up clasts and inclusions; sharp lower contact. Sample at 47.5-47.55 m, 48.5-48.55 m.
48.8-49.75 m	Grey-brown **silt**; highly deformed laminae and silt stringer; minor clay laminae; grits and granules throughout; gradational lower contact. Sample at 49.5-49.55 m.
49.75-50.5 m	Dark grey-brown clayey **silt**, silt laminae; deformed; sharp lower contact. Sample at 50.0-50.05 m.
50.5-51.25 m	Grey-brown **silt** to clayey silt; deformed silt stringers and laminae; some subhorizontal laminae between 50.75 and 51.0 m; grey rip-up clasts; possible deformed rhythmites; gradational lower contact. Sample at 50.85-50.9 m.
51.25-53.5 m	Dark grey-brown to brown clayey **silt** to silt; some laminae and silt stringers; dome dipping, subhorizontal, normal faulting, some grits and granules; some red shale grits; rip-up clasts and dropstones; limestone pebble at 53.5 m; gradational lower contact. Sample at 51.85-51.9 m, 53.05-53.1 m.
53.5-54.25 m	Massive dark grey-brown clayey **silt**; some grits and granules; gradational lower contact. Sample at 53.75-53.8 m, 53.9-53.95 m.
54.25-58.75 m	Grey-brown clayey **silt** to silty clay; silt laminae and stringers; dipping faulted; red grits and granules; between 58.25 and 58.55 m coarsens to mostly silt; gradational lower contact. Sample at 56.25-56.3 m, 57.75-57.8 m, 58.4-58.45 m.
58.75-60.25 m	Dark grey-brown to pale brown with some red sections silty **clay**, clayey silt and silt; some massive sections; silt stringers and laminae; red shale grits and granules; ice-rafted debris bands at 59.2-59.23 m, 59.45-59.55 m, 59.7-59.73 m, and 60.0-60.04 m; many grits and granules, dark grey and red clay; subangular limestone pebble at 59.73 m; at 59.2 m large concentration of red debris. Sample at 59.2-59.25 m.

60.25-61.0 m	Grey-brown clayey **silt**; many clay and silt intraclasts, drop clasts, grits and granules, and red clay; subangular limestone pebble at 60.75 m; silt stringers and laminae are deformed; ice-rafted debris; sharp but faulted lower contact. Sample at 60.8-60.85 m.
61.0-61.25 m	Grey-brown clayey **silt** to silty clay; silt stringers; very minor grits, granules; gradational lower contact.
61.25-61.45 m	Horizontal bedding of reddish grey brown clayey **silt**; grey silty clay; many intraclasts, drop clasts, grits and granules; gradational lower contact.
61.45-61.6 m	Pale grey compact clayey silt **diamicton**; limestone pebbles subangular to subrounded; sharp lower contact. Sample at 61.5-61.6 m.
61.6-64.75 m	Pale grey limestone **bedrock**; striated surface; some fractured and fragmented sections; fossiliferous section; bituminous odour; chert sections; black laminae.

LP-MW-24-10

Location: 543511m E 4743760m N, NAD83, Zone 17
Screened Interval: 3.0-6.1 m, 25.9-27.4 m, 41.1-42.7 m

Depth	Description
0-1.5 m	Oxidized sandy silty **topsoil**; highly disturbed oxidized grey-brown silty clay beds at 0.65 m and 1.05 m; clay content increases at base; gradational lower contact. Sample at 0.65-0.7 m, 1.45-1.5 m.
1.5-1.8 m	Grey-brown to dark brown silty very fine-textured **sand** to silty clay; rip-up clasts; sharp but deformed lower contact.
1.8-3.0 m	Rounded and polished limestone pebbles at top of this unit; grey-brown massive compact clayey silt **diamicton**; becomes grey with mauve hue at 1.8-1.9 m; gradational lower contact. Sample at 1.8-1.85 m, 2.75-2.8 m.
3.0-10.5 m	Massive brown to grey-brown silty clay **diamicton**; minor grits and granules; ~5% grits and granules; minor mauve hue to the matrix; minor silt laminae; at 8.0-8.15 m coarsens to sandy silt, deformed; some silt and clay interbeds 0.5-1.0 cm thick; Port Stanley Till; gradational lower contact. Sample at 3.2-3.25 m, 3.6-3.7 m, 5.0-5.05 m, 6.75-6.85 m, 8.0-8.05 m, 8.5-8.6 m, 10.0-10.1 m.
10.5-12.0 m	Grey-brown sandy **silt**; minor clay; at 11.1-11.2 m, 11.35-11.4 m, 11.55-11.7 m beds of silty clay diamicton ~5% grits and granules, debris flow; some silt stringers and beds, deformed, dewatering structures; gradational lower contact. Sample at 10.5-11.1 m, 11.6-11.65 m.
12.0-12.65 m	Grey-brown silty very fine-textured **sand**; minor silt laminae and stringers; laminae are highly deformed; sharp lower contact. Sample at 12.25-12.3 m.
12.65-12.75 m	Grey-brown silt and silty very fine-textured sand; minor grits and granules; ice-rafted debris; sediment is deformed; deformed lower contact.
12.75-13.5 m	Massive grey-brown with mauve hue silty clay **diamicton**; minor grits and granules; minor deformed silt stringers; gradational lower contact. Sample at 13.25-13.3 m.
13.5-15.0 m	Grey-brown to dark grey **silt**, clay, silty clay and silty very fine-textured sand beds; deformed, faulted, folded; dewatering structures; rip-up clasts; minor grits and granules; gradational lower contact. Sample at 13.75-13.8 m, 14.25-14.3 m.
15.0-15.25 m	Grey-brown silty very fine-textured **sand**; silty clay bed at 15.10 m; lower contact is sharp but faulted. Sample at 15.15-15.2 m.
15.25-16.5 m	Grey-brown clayey **silt** to silty clay; at 15.65-15.7 m silty very fine-textured sand bed; minor silt beds; at 16.25-16.5 m faulted beds and laminae of silt and very fine-textured sand; gradational lower contact. Sample at 16.0-16.05 m.
16.5-17.75 m	Grey-brown with mauve hue **silt**; silt stringers; ice-rafted debris and clay beds between 16.85 and 17.75 m; grits and granules; clay rip-up clasts; sharp lower contact. Sample at 16.7-16.75 m.
17.75-18.25 m	Massive grey-brown with mauve hue silty clay **diamicton**; <5% grits and granules; gradational lower contact. Sample at 17.75-17.8 m, 18.1-18.2 m.

18.25-19.5 m	Grey-brown with mauve hue **silt** with grey-brown silty clay bed at 18.55-18.95 m, sharp lower contact; clayey silt diamicton at 19.05-19.5 m; gradational lower contact. Sample at 18.95-19.0 m.
19.5-19.9 m	Grey-brown with mauve hue silty clay **diamicton**; <5% grits and pebbles, subrounded and polished; deformed lower contact. Sample at 19.6-19.7 m.
19.9-21.0 m	Grey-brown **silt** to silty clay and minor silt beds; gradational lower contact. Sample at 20.25-20.3 m.
21.0-22.5 m	Grey-brown with mauve hue silty **clay** to clayey silt; minor grits and granules; thin beds of ice-rafted debris; minor silt stringers; gradational lower contact. Sample at 21.05-21.1 m, 21.85-21.95 m.
22.5-24.20 m	Grey-brown with mauve hue silty **clay**; massive; minor bedding and laminae; coarsens to clayey silt with clay laminae and silt stringers at depth; highly deformed; dewatering structures; deformed lower contact. Sample at 22.95-23.0 m, 23.75-23.8 m, 24.0-24.05 m.
24.2-24.25 m	Grey-brown silty **clay**, minor fine-textured sand beds, ~1 cm thick; sharp subhorizontal lower contact.
24.25-24.3 m	Silty very fine- to fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; truncated beds; minor clay laminae at the base of this unit; gradational lower contact.
24.3-24.35 m	Massive grey-brown silty **clay**; deformed lower contact.
24.35-24.70 m	Grey-brown silty fine- to very fine-textured **sand**; some clay laminae; ripples, cross-bedding and heavy mineral streaking; truncated beds; sharp lower contact. Sample at 24.5-24.55 m.
24.7-24.8 m	Pebble up to 4 cm **gravel**; grey-brown silty fine- to very fine-textured sand matrix; limestone dominates, subrounded to rounded; loosely packed; gradational lower contact.
24.8-25.0 m	Pebble **gravel**; subrounded to rounded, some polished, limestone; gradational lower contact
25.0-28.0 m	Pea to 5 cm **gravel**, subrounded to rounded and polished; predominantly limestone, minor quartz and granodiorite; gradational lower contact.
28.0-28.25 m	Massive grey-brown coarse-textured **sand**; sharp lower contact.
28.25-30.10 m	Grey-brown silty sandy pea to 5 cm pebble **gravel**; limestone, subrounded and polished; very loose; silty very fine-textured sand at 29.95 m; gradational lower contact.
30.1-30.4 m	Grey-brown silty medium-textured **sand**; minor silt stringers; gradational lower contact. Sample at 30.25-30.3 m.
30.4-34.0 m	Pea to 5 cm pebble **gravel**; minor silty fine- to medium-textured sand; very loose; gravel is subrounded to rounded and polished limestone; gradational lower contact. Sample at 30.7-30.75 m.
34.0-35.1 m	Grey-brown silty fine- to very fine-textured **sand** and silt beds; highly disturbed; siltier at 34.65 m; minor pebble gravel; dewatering structures; deformed lower contact. Sample at 34.25-34.3 m.
35.1-35.5 m	Grey-brown with mauve hue silty very fine-textured **sand**, silty clay and clayey silt beds; highly deformed; dewatering structures, faults; gradational lower contact. Sample at 35.25-35.3 m.
35.5-37.0 m	Grey-brown silty very fine-textured **sand**; grits and granules at 35.75 m; grey-brown to red-brown silty clay between 36.25 and 36.5 m; some subhorizontal bedding in sands;

	minor silt and clay stringers; gradational lower contact. Sample at 35.75-35.8 m, 36.35-36.45 m.
37.0-38.5 m	Grey-brown silty fine- to very fine-textured **sand**; some rip-up clasts of silty clay; some silt and clay stringers and laminae; highly deformed, dewatering structures; gradational lower contact. Sample at 37.65-37.75 m, 38.0-38.05 m.
38.5-40.0 m	Grey-brown silty fine- to very fine-textured **sand**; coarsens to medium-textured sand at 39.1 m; mostly massive, minor grits; some heavy mineral streaking; deformed silt beds at 39.6-39.7 m, dewatering structures; at 39.75-39.8 m grey-brown silt and reddish brown clay bed; organic material observed between 39.25-39.3 m and 39.97-40.02 m; sharp lower contact. Sample at 39.25-39.3 m, 39.75-39.8 m, 39.97-40.02 m.
40.0-41.5 m	Grey-brown silty fine-textured **sand**; clayey silt to clay, deformed bed at 40.75-40.8 m; red clay clast ~1 cm diameter; limestone cobble at 41.2 m polished and striated; gradational lower contact.
41.5-44.5 m	No recovery, likely pea to cobble **gravel**; subrounded to rounded; pale grey limestone; matrix washed away.
44.5-47.5 m	Pea to 4 cm **gravel**; silty fine- to very fine-textured sand matrix; limestone clasts dominate, greenish pale tan to dark grey; subrounded to rounded; gradational lower contact. Sample at 44.5-46.0 m, 46.0-47.5 m.
47.5-49.0 m	Grey-brown silty very fine-textured **sand**; at 47.0 m grey-brown silty clay, red silty very fine-textured sand beds; rip-up clasts; silt stringers; silt beds at 48.1 m, 48.2 m, and 48.35 m, 1-2 cm thick; gradational lower contact. Sample at 47.7-47.75 m, 48.35-48.4 m.
49.0-50.5 m	Grey-brown to grey silty very fine-textured **sand** to clay; some horizontal beds, mostly deformed; rip-up clasts, dewatering structures; red clay clasts scattered throughout; red clay beds; silty clay **diamicton** with grits, granules, silt stringers, clay intraclasts and ice-rafted debris at 49.25-49.3 m, 49.55-49.1 m, 49.85-49.9 m, 50.2-50.25 m; massive clay beds with minor red grits at 49.75-49.8 m, 50.15-50.2 m, 50.3-50.5 m; gradational lower contact. Sample at 49.6-49.7 m, 50.4-50.5 m.
50.5-52.0 m	Grey-brown to tan **silt** and clayey silt to silty clay; highly deformed; some faulting; pale grey rip-up clasts; some red clasts granule to 1 cm limestone clasts; at 51.25-51.3 m grey-brown silty clay diamicton, with grits and granules overlying 5 cm bed of gravel with silty clay to silty fine-textured sand matrix, clasts are subangular to rounded; gradational lower contact. Sample at 51.25-51.3 m, 51.7-51.75 m.
52.0-52.85 m	Grey-brown clayey **silt** to silty clay beds; deformed, faulted, and some are subvertical; clay has reddish hue; rip-up clasts and silt stringers; gradational lower contact.
52.85-53.0 m	Reddish grey-**brown**, grey-brown and grey silty clay; grey clay inclusions; silt stringers and laminae; rip-up clasts and ice-rafted debris; gradational lower contact. Sample at 52.9-53.0 m.
53.0-53.5 m	Horizontal beds of dark grey to pale grey with mauve hue silty **clay**, clayey silt and silt; highly deformed at 53.4 m; some ripples; some faulting; gradational lower contact. Sample at 53.25-53.3 m.
53.5-53.75 m	Dark grey-brown **clay** interbedded with silt; possible rhythmites; deformed lower contact.
53.75-54.0 m	Grey-brown clayey **silt** to silty clay; minor silt stringers and rip-up clasts; red intraclasts; gradational lower contact.
54.0-54.6 m	Grey-brown silty clay **diamicton**; grits and granules throughout; gradational lower contact. Sample at 54.0-54.05 m.

54.6-55.0 m	Grey-brown silty **clay**; silt laminae; deformed silt stringers; grits and granules; minor limestone cobbles; gradational lower contact. Sample at 54.8-54.85 m.
55.0-57.4 m	Rhythmically laminated silty **clay** beds and clayey silt, silty very fine-textured sand; ripples and cross-bedding; some sections are distinctly reddish; clay beds are spaced 5-10 cm apart and are 2-5 cm thick, but are thinner in the upper 0.5 m of the unit; silty very fine-textured sand has heavy mineral streaking, truncated ripples and cross-bedding; sharp lower contact. Sample at 55.35-55.4 m, 56.75-56.8 m, 57.0-57.03 m.
57.4-57.6 m	Grey-brown silty **clay**; upper 10 cm has ~10% clay rip-up clasts and inclusions, lower 10 cm is massive; some red clay clasts; sharp lower contact.
57.6-58.0 m	Grey-brown clayey silt, minor sand, **diamicton**; ~5-10% grits to 5 cm clasts, subangular limestone; some red grains; till; gradational lower contact. Sample at 57.75-57.8 m.
58.0-58.25 m	Grey-brown reddish hue compact silty clay to silt very fine-textured sandy **diamicton**; 5-10% clasts, limestone; minor red shale clasts; sharp lower contact. Sample at 58.1-58.2 m.
58.25-59.5 m	Light to dark grey limestone **bedrock**; some black laminae; chert inclusions.

LP-MW-25-10

Location: 557556m E 4744623m N, NAD83, Zone 17
Screened Interval: 1.5-4.6 m, 12.2-13.7 m, 31.4-34.4 m

Depth	Description
0-7.5 m	Gravel **fill**; railway gravel; gradational lower contact.
7.5-9.85 m	Poor recovery oxidized brown silty medium-textured **sand**; minor pebble gravel; gradational lower contact.
9.85-10.15 m	Oxidized brown silty fine- to very fine-textured sand; minor pebble to 5 cm gravel, subangular to subrounded, limestone; sharp lower contact.
10.15-10.5 m	Brown medium-fine-textured **sand**, minor silt; some heavy mineral streaking, ripples and cross-bedding; sediment is disturbed; gradational lower contact. Sample at 10.2-10.25 m.
10.5-10.95 m	Brown fine- to very fine-textured **sand**; sharp lower contact.
10.95-11.2 m	Oxidized brown interbedded **silt** and silty very fine-textured sand; minor gravel; highly deformed beds; sharp lower contact. Sample at 11.0-11.05 m.
11.2-11.5 m	Brown very fine-textured **sand**; minor silt; dark brown silt laminae; deformed; gradational lower contact.
11.5-11.75 m	Brown very fine-textured **sand**; minor heavy mineral streaking; faulted and deformed; sharp lower contact. Sample at 11.6-11.7 m.
11.75-12.0 m	Brown silty very fine-textured **sand**; ice-rafted or rip-up silt balls at 11.75 m; at 11.9 m grey-brown faulted clayey silt; very fine-textured sand at the base of this unit; gradational lower contact.
12.0-12.75 m	Brown silty very fine to medium-fine-textured **sand**; silty sand laminae; highly deformed in sections; minor pebble gravel; minor heavy mineral streaking; sharp but deformed lower contact. Sample at 12.4-12.5 m.
12.75-12.8 m	Brown medium- to coarse-textured **sand**; pea gravel at base; sharp lower contact.
12.8-12.95 m	Brown with reddish hue sandy **silt**; grits and granules; massive; black shale granules; sharp lower contact.
12.95-13.5 m	Brown interbedded **silt**, silty very fine-textured sand, grits, granules and pebbles; deformed; silt stringers; gradational lower contact. Sample at 13.1-13.2 m.
13.5-13.85 m	Brown to oxidized irregular beds of **silt**, silty very fine- and medium-coarse-textured sand; grits and granules; some pebbles; silt content increases with depth; gradational lower contact.
13.85-14.5 m	Brown with mildly oxidized sections medium-coarse **sand** with minor silt to silty very fine- to fine-textured sand; minor coarse-textured sand; grits and granules; minor bedding; sharp lower contact. Sample at 13.9-14.0 m.
14.5-16.50 m	Brown to grey-brown **silt**, silty very fine-textured sand; some very gritty sections; gradational lower contact. Sample at 14.7-14.75 m, 15.9-16.0 m.
16.5-16.65 m	Brown silty very fine- to medium-textured **sand**; some medium-coarse-textured sand; grits and granules; minor pea gravel; minor bedding; sharp lower contact.

16.65-17.5 m	Brown mildly oxidized silty fine-textured **sand**; very minor horizontal banding and heavy mineral streaking; massive; sharp lower contact. Sample at 17.1-17.2 m.
17.5-17.6 m	Brown to orange-brown sandy **silt**; sharp lower contact.
17.6-18.0 m	Brown medium-fine-textured **sand**; some heavy mineral streaking; ripples and cross-bedding; silt beds; gradational lower contact.
18.0-18.75 m	Brown silty medium-fine-textured **sand**; oxidized between 18.2 and 18.4 m; some heavy mineral streaking and ripples, cross-bedding; organic material observed; deformed lower contact. Sample at 181.5-18.6 m.
18.75-18.8 m	Grey-brown clayey **silt** and medium-coarse-textured sand; dipping beds; silty clay balls, rip-up clasts; truncated beds; organic material observed; gradational lower contact.
18.8-19.5 m	Grey-brown with reddish hue silty very fine-textured **sand**; heavy mineral streaking, ripples and cross-bedding; clayey silt bed at 19.0 m; normal faults; organic material observed; gradational lower contact. Sample at 18.95-19.0 m.
19.5-21.0 m	Pale grey-brown very fine- to fine-textured **sand**; minor silt; grey-brown with reddish hue clayey silt bed at 20.8 m; heavy mineral streaking; ripples and cross-bedding; organic material observed; gradational lower contact. Sample at 149.5-21.0 m.
21.0-24.0 m	Pale grey-brown with reddish hue fine- to very fine-textured **sand** rhythmites interbedded with grey-brown with reddish hue silt and silty very fine-textured sand to clayey silt to clay; sands have heavy mineral streaking, ripples and cross-bedding; some highly deformed sections; clayey silt rhythmites at 22.5-22.55 m, 22.9-23.0 m, 23.3-23.35 m, 23.75-23.8 m; gradational lower contact. Sample at 21.25-21.3 m, 21.9-21.95 m, 22.75-22.8 m, 22.9-23.0 m.
24.0-25.5 m	Poor recovery; grey-brown silty very fine-textured **sand**; gradational lower contact.
25.5-27.0 m	Pale grey-brown silty very fine- to medium-fine-textured **sand** and clayey silt; some bedding; rip-up clast of clayey silt at 25.75 m; clayey silt bed at 26.75 m; possible rhythmites but highly deformed; organic material observed; gradational lower contact.
27.0-27.25 m	Grey-brown silty very fine-textured **sand** and sandy silt; subhorizontal and deformed beds; minor silty clay drop clasts or rip-up clasts; minor red shale granules; organic material observed; sharp lower contact. Sample at 27.3-27.35 m.
27.25-27.45 m	Grey-brown clayey **silt** interbedded with silt; beds are folded, faulted, dipping and some are subhorizontal; silty clay rip-up clasts; organic material observed; gradational lower contact.
27.45-27.55 m	Dark grey **clay** and silt overlying reddish grey-brown clayey silt; possible rhythmites; horizontally bedded silts; silt laminae; mildly deformed at base; organic material observed; gradational lower contact.
27.55-28.0 m	Grey-brown silty very fine-textured **sand**; minor clayey silt laminae; inclusions of clean very fine-textured sand; very minor ripples and cross-bedding, and heavy mineral streaking; lower 5 cm deformed laminated silts and very fine-textured sand; at 27.9 m ~2 cm horizontal bed of grits and red clay clasts, ice-rafted debris; organic material observed; sharp lower contact. Sample at 27.85-27.9 m.
28.0-28.1 m	Grey-brown to red-brown silty **clay**; sharp but faulted lower contact.
28.1-28.5 m	Grey-brown silt and silty very fine-textured **sand**; silt laminae; coarsening to very fine-textured sand at 28.2 m; ripples, cross-bedding and heavy mineral streaking; very minor grey clay intraclasts; deformation at the top of this unit; organic material observed; gradational lower contact.

28.5-28.85 m	Pale grey-brown very fine-textured **sand**, minor silt; minor silt stringers; massive sand; organic material observed; sharp lower contact.
28.85-29.1 m	Grey-brown silty very fine-textured **sand**; ripples, cross-bedding, heavy mineral streaking; at 28.9 grey-brown clayey silt inclusion 5 cm long; minor grey clay granule inclusions; organic material observed; sharp lower contact. Sample at 29.0-29.05 m.
29.1-29.45 m	Grey-brown very fine-textured **sand**, minor silt; ripples and cross-bedding; minor heavy mineral streaking; between 29.4 and 29.45 m many grits, granules, clay intraclasts; deformed silt stringers; organic material observed; sharp lower contact.
29.45-29.5 m	Dark grey-brown silty **clay** to red-brown clayey silt; 2 cm bed of silty very fine-textured sand and silt laminae between the silty clay and clayey silt beds; organic material observed; sharp but faulted lower contact.
29.5-29.75 m	Grey-brown silty very fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; some deformation; grey clay intraclasts; organic material observed; sharp and faulted lower contact.
29.75-29.9 m	Grey-brown silty very fine-textured **sand** to silty fine-textured sand; some clayey silt stringers, rip-up clasts; grey clay grits; deformed, dewatering structures; sharp horizontal lower contact. Sample at 29.75-29.8 m.
29.9-30.0 m	Dark grey to grey with reddish hue silty **clay** beds and silt laminae; possible rhythmite; organic material observed; gradational lower contact.
30.0-30.2 m	Grey-brown silty very fine-textured **sand** and silt laminae, minor fine-textured sand; minor heavy mineral streaking; coarsens to fine-textured sand at 30.18 m; subhorizontal laminae, some normal faulting; loaded but sharp lower contact.
30.2-30.25 m	Dark grey-brown silty clay; minor dark and lighter coloured laminae; sharp lower contact.
30.25-30.3 m	Grey-brown silty very fine- to fine-textured **sand**; minor medium-textured sand; mostly massive, some dewatering structures; sharp lower contact.
30.3-30.4 m	Grey-brown clayey **silt** to silty clay; some pale and dark grey clay laminae; pale grey silt lenses; red clay lens at 32.38 ~1 cm thick; black limestone pebble underlying red clay lens; some black clay drop clasts; sharp lower contact.
30.4-30.53 m	Pale grey medium-fine-textured **sand**, minor silt; faint ripples and cross-bedding; minor heavy mineral streaking; sharp lower contact. Sample at 30.5-30.55 m.
30.53-30.75 m	Dark grey brown **clay** to clayey silt; some dark clay laminae; lower contact is disturbed with blocks of clay intermixed with underlying sand; faulting and loading structures.
30.75-30.8 m	Grey-brown silty fine-textured **sand**; massive; gradational lower contact.
30.8-31.35 m	Grey-brown silty fine- to medium-textured **sand**; ripples, cross-bedding and heavy mineral streaking; minor silt laminae; minor medium-coarse-textured sand beds; sharp lower contact. Sample at 31.25-31.3 m.
31.35-31.5 m	Massive pale grey fine-textured **sand**; gradational lower contact.
31.5-31.8 m	Grey-brown very fine-textured **sand**; heavy mineral streaking, ripples and cross-bedding; 4 cm bed of silty very fine-textured sand at 31.7 m; gradational lower contact.
31.8-32.25 m	Grey-brown medium-fine-textured **sand**; ripples, cross-bedding and heavy mineral streaking; some medium-coarse-textured sand; sharp lower contact. Sample at 31.98-32.03 m.

32.25-32.5 m	Pale grey-brown fine-textured **sand**; minor silt; mostly massive, minor heavy mineral streaking; at 32.35 m deformed silt and very fine-textured sand bed ~1-3 cm thick; at 32.45 m fines to sandy silt; gradational lower contact.
32.5-32.6 m	Dark grey-brown clayey **silt**; highly deformed and includes blocks of overlying sand; silt stringers; red clay intraclasts; minor grits and granules; sharp but deformed lower contact.
32.6-32.7 m	Pale grey-brown silty very fine-textured **sand**; large concentration of rip-up clasts, drop clasts and grey and red intraclasts; sharp but deformed lower contact. Sample at 32.65-32.7 m.
32.7-33.0 m	Grey-brown clayey **silt** to silty clay; silt laminae and stringers; drop clasts, clay intraclasts and rip-up clasts; some highly deformed sections; red clay sections; gradational lower contact.
33.0-34.2 m	Pale grey-brown silty fine- to very fine-textured **sand**; grits, granules, rip-up clay clasts, throughout; some horizontal silt laminae; pebble at 33.25 m; at 33.45-33.6 m and 33.8-33.84 m beds of silty very fine-textured sand with greater concentration of silty clay balls, grits and granules than surrounding material, lower of these two beds is dipping; lots of intermixing of sediments; many red and orange grits; at 33.45-33.6 m dark clayey silt bed highly deformed; some heavy mineral streaking; silt stringers; faint ripples and cross-bedding; gradational lower contact. Sample at 33.5-33.55 m, 34.15-34.2 m.
34.2-34.5 m	Massive grey-brown fine- to very fine-textured **sand**, minor silt; some silty clay; gradational lower contact.
34.5-35.3 m	Grey-brown silty fine- to medium-coarse-textured **sand**; much ice-rafted debris, grits and granules to pea gravel, angular limestone; dipping bed of pebble gravel at 35.0 m; black clay, ice-rafted debris; silt bed at 35.5 m; dipping beds; sharp but loaded lower contact. Sample at 34.8-34.85 m.
35.3-36.0 m	Grey-brown clayey **silt**; pale grey silt laminae; bands of ice-rafted debris, black clay and some red shale; subhorizontal silt laminae; ice-rafted debris throughout; gradational lower contact. Sample at 35.65-35.7 m.
36.0-37.5 m	Grey-brown with reddish hue clayey **silt**, silt and silty very fine-textured sand; many silt laminae; between 36.1 and 36.15 m beds of ice-rafted debris, silt and clayey silt laminae; at 36.1-36.25 m clayey silt and silt laminae are highly faulted overlying massive silt; between 36.25 and 36.85 m silt beds, silt stringers, clayey silt, ice-rafted debris; folding and faulting; gradational lower contact. Sample at 36.3-36.35 m, 37.2-37.25 m.
37.5-38.45 m	Grey-brown silty **clay** and silt and silty very fine-textured sand laminae; some highly faulted laminae; some very finely laminated sections; minor drop clasts; some truncated beds; some deformed sections, dewatering structures; sharp lower contact. Sample at 37.95-38.0 m.
38.45-38.5 m	Grey-brown clayey **silt**; massive; capped with 1 cm of silty clay; gradational lower contact.
38.5-38.8 m	Grey-brown **silt**; some pale grey silt laminae; deformed but sharp lower contact. Sample at 38.5-38.55 m.
38.8-39.75 m	Grey brown clayey **silt**; silt beds and laminae; faulted and truncated beds; gradational lower contact. Sample at 39.45-39.5 m.
39.75-40.25 m	Grey-brown with reddish hue **silt** to clayey silt; silt stringers; grits, granules and some pebbles; possible flow till; capped with silt; sharp lower contact. Sample at 40.0-40.05 m.
40.25-40.5 m	Grey-brown massive clayey **silt**; minor grits and pea gravel; gradational lower contact.

40.5-41.3 m	Grey-brown with red hue sandy silt **diamicton**; grits and granules to pebble gravel; gradational lower contact. Sample at 40.75-40.8 m.
41.3-42.5 m	Grey-brown to tan with reddish hue **silt**, clayey silt and silty clay; silty clay beds are highly deformed and truncated; rip-up clasts; reddish clay clasts; gradational lower contact. Sample at 41.75-41.8 m, 42.15-42.2 m.
42.5-44.1 m	Grey-brown with reddish hue sandy silt **diamicton**; grits to pebbles, mostly limestone; some siltier sections; large bedrock fragment at 43.9-44.0 m separated from the bedrock surface from compact sandy silt diamicton; sharp lower contact. Sample at 43.0-43.05 m, 43.7-43.75 m.
44.1-45.0 m	Pale grey with bluish hue limestone **bedrock**; fossiliferous (corral); bituminous.

LP-MW-26-10

Location: 524291m E 4745915m N, NAD83, Zone 17
Screened Interval: 3.7-6.7 m

Depth	Description
0-0.2 m	Dark brown **topsoil**; sharp lower contact.
0.2-0.9 m	Oxidized medium-textured **sand**; gradational lower contact.
0.9-1.75 m	Brown medium-textured **sand**; some oxidized sections; organic material observed at 1.5-1.75 m; gradational lower contact. Sample at 1.25-1.3 m.
1.75-2.1 m	Brown medium-fine-textured **sand**; minor very fine-textured sand laminae; some heavy mineral streaking; massive; organic material observed; sharp lower contact.
2.1-2.25 m	Brown to oxidized brown **silt** and silty very fine-textured sand; mottled, disturbed silt bedding; organic material observed; sharp lower contact. Sample at 2.15-2.2 m.
2.25-2.45 m	Brown **silt** and silty very fine-textured sand laminae; heavy mineral banding; organic material observed; sharp lower contact.
2.45-3.0 m	Brown laminated very fine-, fine- and medium-fine-textured **sand**; slightly dipping laminae; organic material observed; heavy mineral streaking; gradational lower contact. Sample at 2.7-2.75 m.
3.0-3.75 m	Brown medium-coarse-textured **sand**; massive; minor clayey silt balls; sharp lower contact. Sample at 3.25-3.3 m.
3.75-4.5 m	Brown medium-textured **sand**; multiple clayey silt balls at 3.75-3.8 m; massive; gradational lower contact. Sample at 4.0-4.05 m.
4.5-6.0 m	Brown medium- to medium-coarse-textured **sand**; massive with minor heavy mineral streaking; minor oxidized bands; gradational lower contact. Sample at 4.5-6.0 m.
6.0-6.75 m	Brown medium-coarse-textured **sand**; oxidized-brown between 6.0 and 6.25 m; heavily oxidized beds at 6.05-6.09 m, and 6.2-6.25 m; grey-brown with mauve hue at 6.25-6.75 m; deformed in lowest 10 cm; sharp lower contact. Sample at 6.4-6.5 m.
6.75-6.8 m	Grey-brown with mauve hue medium-textured **sand**; minor horizontal heavy mineral banding; sharp lower contact.
6.8-6.82 m	Brown coarse- to very coarse-textured sand; minor granule gravel; gradational lower contact.
6.82-6.9 m	Grey-brown with mauve hue medium-textured **sand**; minor slightly dipping heavy mineral banding; sharp lower contact.
6.9-7.2 m	Brown coarse-textured **sand** to granule gravel; gravel is rounded; minor medium-textured sand; limestone pebble at base of unit; sharp lower contact. Sample at 7.0-7.05 m.
7.2-7.5 m	Grey with mauve hue silty **clay**; minor silt laminae; gradational lower contact. Sample at 7.25-7.3 m.
7.5-8.8 m	Pale grey with mauve hue silty very fine-textured **sand**; deformed; ripples, cross-bedding and heavy mineral streaking; at 7.85-7.9 m grey-brown with mauve hue silty clay bed with sharp upper and lower contacts; gradational lower contact. Sample at 8.25-8.5 m.

8.8-9.0 m	Grey-brown with mauve hue horizontal laminae of **silt**, silty clay and clayey silt; minor drop clasts; gradational lower contact.
9.0-10.5 m	Grey-brown with mauve hue clayey **silt** to silty clay; massive; grey and reddish clay intraclasts up to 2 cm diameter; gradational lower contact. Sample at 9.75-9.8 m.
10.5-12.5 m	Grey-brown with mauve hue to pale grey silty **clay** to clayey silt; many clay rip-up and drop clasts; some red clay inclusions; some deformed and faulted silt laminae; sharp lower contact. Sample at 11.25-11.3 m.
12.5-12.65 m	Grey-brown with mauve hue sandy **silt**; soft; grits to pebbles, limestone; sharp lower contact.
12.65-13.2 m	Grey-brown with mauve hue compact massive sandy silt **diamicton**; ~10% grits to pebbles; subangular to subrounded limestone; gradational lower contact. Sample at 12.95-13.0 m.
13.2-16.5 m	Grey-brown with mauve hue massive clayey silt **diamicton**; ~5% grits to rare pebbles; gradational lower contact. Sample at 13.3-13.35 m, 14.5-14.6 m, 15.75-15.8 m.
16.5-17.0 m	Grey-brown clayey **silt**; silt stringers and laminae; limestone cobble at 16.6-16.65 m; minor clay laminae; highly deformed; gradational lower contact.
17.0-18.0 m	Grey-brown **silt**, clay and reddish clay laminae; deformed; ice-rafted debris; gradational lower contact. Sample at 17.2-17.25 m.
18.0-18.15 m	Grey-brown silty **clay** and silt beds up to 1 cm thick; highly deformed; minor grits and granules sheared sharp lower contact.
18.15-19.5 m	Grey-brown with mauve hue **silt** coarsening to very fine-textured sand; massive silt, some silt stringers; within the sand, ripples, cross-bedding and silt and clay stringers; silty clay bed at 18.65-18.7 m; cobble at 19.0 m; grits and granules throughout; much faulting and deformation; gradational lower contact. Sample at 18.45-18.5 m, 18.7-18.75 m.
19.5-25.5 m	Grey-brown with mauve hue silty very fine-textured **sand**; heavy mineral streaking, ripples and cross-bedding; highly deformed; grey-brown silty clay rhythmites at 19.8-19.84 m, 20.02-20.1 m, 20.3-20.35 m, 21.5-21.53 m, 21.9-21.91 m, 22.5-22.55 m, 23.0-23.3 m, 23.5-23.53 m, 23.55-23.58 m, 24.45-24.47 m, 24.6-24.7 m, 25.35-25.38 m, highly deformed and include silt stringers and red shale and clay grits; limestone cobble at 24.1 m; gradational lower contact. Sample at 20.2-20.25 m, 21.75-21.8 m, 23.25-23.3 m, 23.55-23.58 m, 24.25-24.3 m.
25.5-29.6 m	Grey-brown with mauve hue silt to clayey **silt** to silty clay; clay rhythmites at 25.75-25.77 m, and 26.0-26.05 m; ice-rafted debris; clay laminae within massive silt; some grits and granules; rare pebbles at 26.3-26.6 m; some deformed beds; some silt stringers; cobble at 27.25 m; minor red shale clasts 1-2 cm in diameter; gradational lower contact. Sample at 25.65-25.7 m, 26.7-26.75 m, 27.75-27.8 m, 29.25-29.3 m.
29.6-30.3 m	Grey-brown sandy silt **diamicton**; grits to pebbles, subangular to subrounded, limestone; massive; Catfish Creek Till; gradational lower contact. Sample at 29.7-29.75 m, 30.15-30.2 m.
30.3-30.35 m	Grey brown clayey silt **diamicton**; sharp lower contact.
30.35-32.5 m	Pale grey limestone **bedrock**; bituminous odour; fossiliferous sections; black speleothems.

Appendix 3

Particle Size Analyses

(digital file)

Note: The data is available in this digital data release as a separate digital file and is not included in this report.

Appendix 4

Carbonate Analyses

(digital file)

Note: The data is available in this digital data release as a separate digital file and is not included in this report.

Appendix 5

Pebble Lithologies

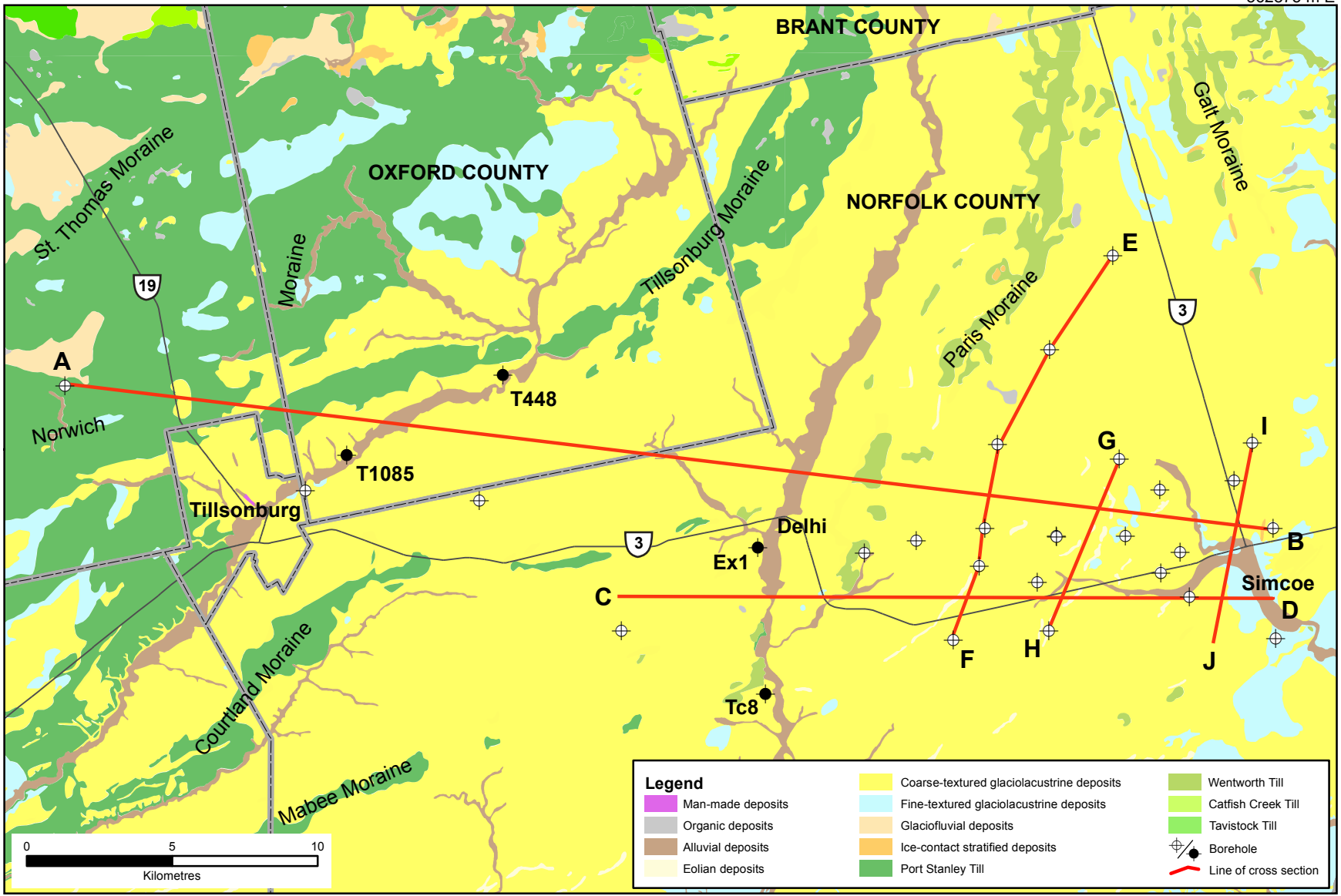
(digital file)

Note: The data is available in this digital data release as a separate digital file and is not included in this report.

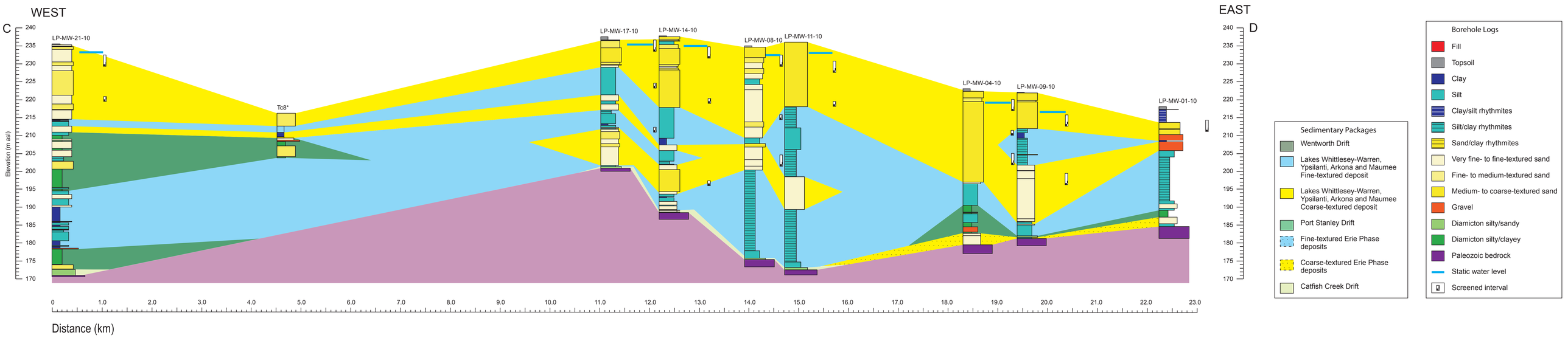
Appendix 6

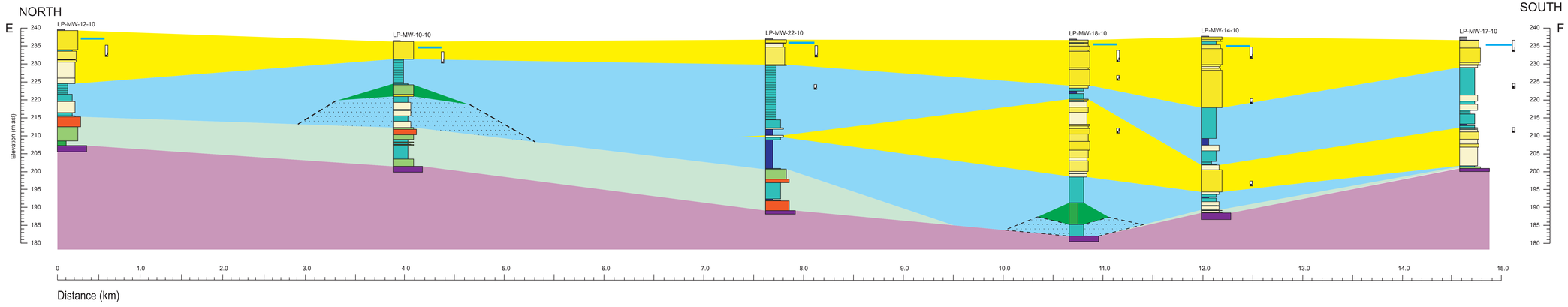
Cross Sections

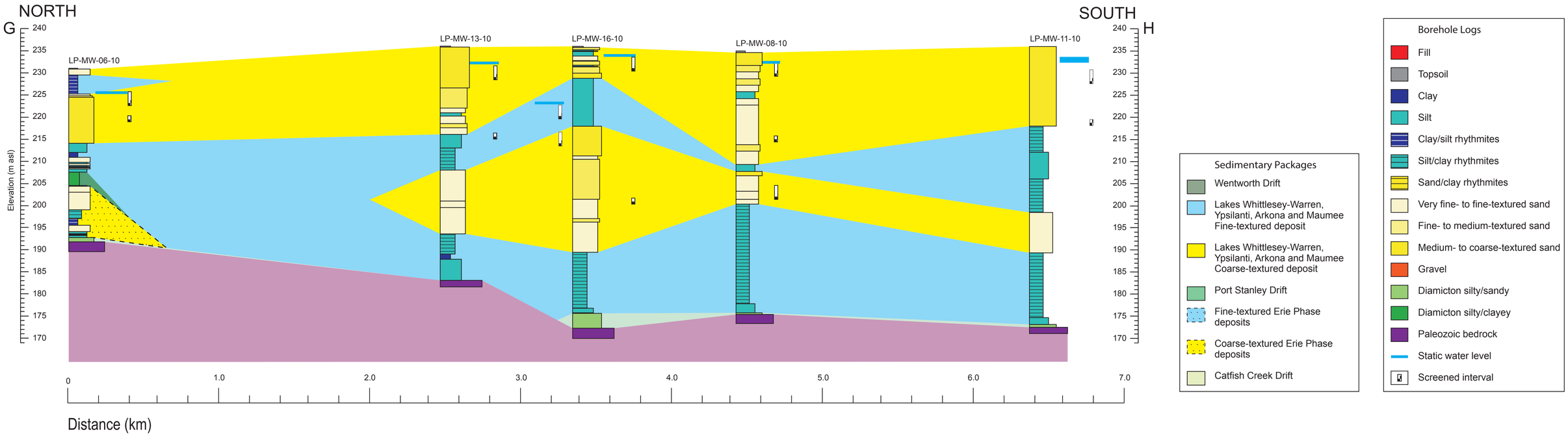
Note: These pages are formatted for larger than letter-size paper.

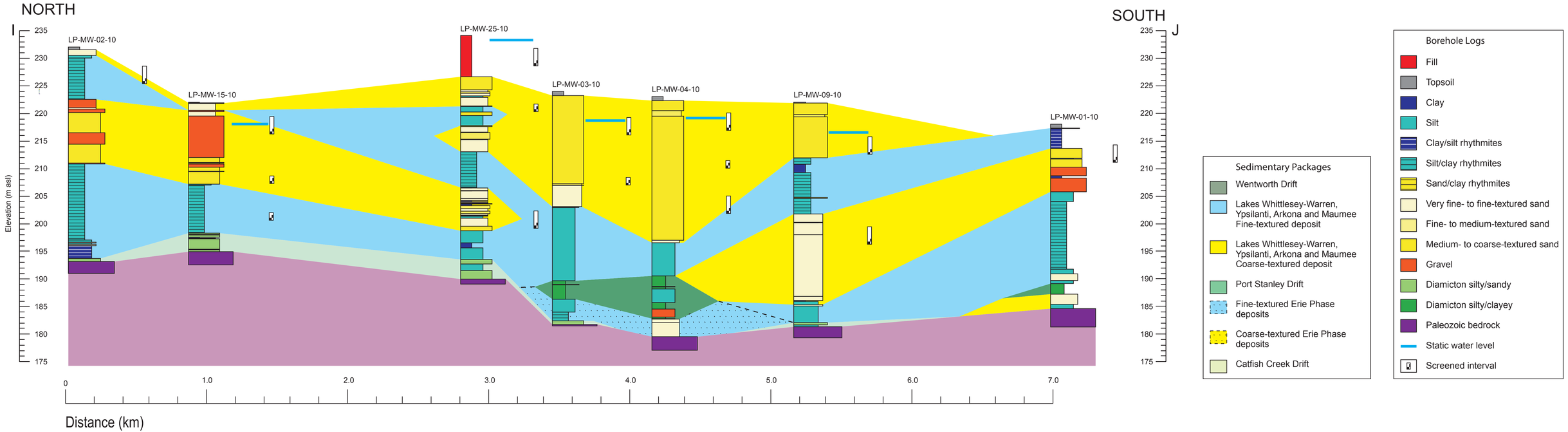

562875 m E
4765075 m N
4733000 m N
514750 m E
BRANT COUNTY
OXFORD COUNTY
NORFOLK COUNTY
St. Thomas Moraine
Moraine
Tillsonburg Moraine
Galt Moraine
Paris Moraine
Courtland Moraine
Mabee Moraine
19
3
A
B
C
D
E
F
G
H
I
J
T448
T1085
Tc8
Ex1
Norwich
Tillsonburg
Delhi
Simcoe
0
5
10
Kilometres
Legend
Man-made deposits
Organic deposits
Alluvial deposits
Eolian deposits
Coarse-textured glaciolacustrine deposits
Fine-textured glaciolacustrine deposits
Glaciofluvial deposits
Ice-contact stratified deposits
Port Stanley Till
Wentworth Till
Catfish Creek Till
Tavistock Till
Borehole
Line of cross section


WEST
EAST
A
B
Elevation (m asl)
Distance (km)
Sedimentary Packages
Wentworth Drift
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Fine-textured deposit
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Coarse-textured deposit
Port Stanley Drift
Fine-textured Erie Phase deposits
Coarse-textured Erie Phase deposits
Catfish Creek Drift
Borehole Logs
Fill
Topsoil
Clay
Silt
Clay/silt rhythmites
Silt/clay rhythmites
Sand/clay rhythmites
Very fine- to fine-textured sand
Fine- to medium-textured sand
Medium- to coarse-textured sand
Gravel
Diamicton silty/sandy
Diamicton silty/clayey
Paleozoic bedrock
Static water level
Screened interval
LP-MW-25-10


WEST
EAST
C
D
LP-MW-21-10
Tc8*
LP-MW-17-10
LP-MW-14-10
LP-MW-08-10
LP-MW-11-10
LP-MW-04-10
LP-MW-09-10
LP-MW-01-10
Elevation (m asl)
240
235
230
225
220
215
210
205
200
195
190
185
180
175
170
0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
19.0
20.0
21.0
22.0
23.0
Distance (km)
Sedimentary Packages
Wentworth Drift
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Fine-textured deposit
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Coarse-textured deposit
Port Stanley Drift
Fine-textured Erie Phase deposits
Coarse-textured Erie Phase deposits
Catfish Creek Drift
Borehole Logs
Fill
Topsoil
Clay
Silt
Clay/silt rhythmites
Silt/clay rhythmites
Sand/clay rhythmites
Very fine- to fine-textured sand
Fine- to medium-textured sand
Medium- to coarse-textured sand
Gravel
Diamicton silty/sandy
Diamicton silty/clayey
Paleozoic bedrock
Static water level
Screened interval


NORTH
SOUTH
E
F
LP-MW-12-10
LP-MW-10-10
LP-MW-22-10
LP-MW-18-10
LP-MW-14-10
LP-MW-17-10
Elevation (m asl)
240
235
230
225
220
215
210
205
200
195
190
185
180
0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
Distance (km)
Sedimentary Packages
Wentworth Drift
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Fine-textured deposit
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Coarse-textured deposit
Port Stanley Drift
Fine-textured Erie Phase deposits
Coarse-textured Erie Phase deposits
Catfish Creek Drift
Borehole Logs
Fill
Topsoil
Clay
Silt
Clay/silt rhythmites
Silt/clay rhythmites
Sand/clay rhythmites
Very fine- to fine-textured sand
Fine- to medium-textured sand
Medium- to coarse-textured sand
Gravel
Diamicton silty/sandy
Diamicton silty/clayey
Paleozoic bedrock
Static water level
Screened interval


NORTH
SOUTH
G
H
LP-MW-06-10
LP-MW-13-10
LP-MW-16-10
LP-MW-08-10
LP-MW-11-10
Elevation (m asl)
240
235
230
225
220
215
210
205
200
195
190
185
180
175
170
0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Distance (km)
Sedimentary Packages
Wentworth Drift
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Fine-textured deposit
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Coarse-textured deposit
Port Stanley Drift
Fine-textured Erie Phase deposits
Coarse-textured Erie Phase deposits
Catfish Creek Drift
Borehole Logs
Fill
Topsoil
Clay
Silt
Clay/silt rhythmites
Silt/clay rhythmites
Sand/clay rhythmites
Very fine- to fine-textured sand
Fine- to medium-textured sand
Medium- to coarse-textured sand
Gravel
Diamicton silty/sandy
Diamicton silty/clayey
Paleozoic bedrock
Static water level
Screened interval


NORTH
I
SOUTH
J
LP-MW-02-10
LP-MW-15-10
LP-MW-25-10
LP-MW-03-10
LP-MW-04-10
LP-MW-09-10
LP-MW-01-10
Elevation (m asl)
235
230
225
220
215
210
205
200
195
190
185
180
175
0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Distance (km)
Sedimentary Packages
Wentworth Drift
Lakes Whittlesey-Warren, Ypsilanti, Arkona and Maumee Fine-textured deposit
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