HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC. (CANADA)
CODRINGTON PROPERTY
PART LOTS 32, 33, AND 34, CONCESSION 6
TOWNSHIP OF BRIGHTON
COUNTY OF NORTHUMBERLAND, ONTARIO

Prepared for:
St. Mary's Cement Inc. (Canada)

March 2009

File 051777.00

Distribution:
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March 30, 2009

St. Marys Cement Inc. (Canada)
55 Industrial Street
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Attention: Ms. Melanie Horton, MCIP, RPP
Property and Resource Manager

Dear Sirs:

Re: Hydrogeological Study
St. Marys Cement Inc. (Canada) Codrington Property
Part of Lots 32, 33 and 34, Concession 6
Township of Brighton
County of Northumberland, Ontario
File 051777.00

We are pleased to submit our final report for the above-noted project. The report provides the results of the Hydrogeological Study for the Codrington Property that is proposed to be operated as a sand and gravel pit above the groundwater table.

The results of the Hydrogeological Study, which include the data of the May 2008 monitoring event, indicates that the above water table pit development and operations will not impact local groundwater or surface water resources. Therefore, a Level 2 Hydrogeological Study is not required. A performance monitoring program is outlined in Section 4.0 of the report.

Thank you for the opportunity to complete the project. Please contact us if you have any questions.

Yours truly,
JAGGER HIMS LIMITED

Jason T. Balsdon, M.A.Sc., P.Eng.
Consulting EngineerJTB:nah

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MEMORANDUM

TO: Mr. Mike Le Breton, B.E.S.
Mr. Amarjit Sandhu

COPY: Ms. Melanie Horton, MCIP, RPP

FROM: Jason Balsdon, P.Eng.
Vyacheslav Magmedov, P.Geo.

DATE: May 15, 2009

SUBJECT: Hydrogeological Study
St. Marys Cement Inc. (Canada) Codrington Property
File 051777.00

Based on discussions between the MNR representative and CBM, which was held on May 8, 2009, it is understood that the groundwater performance monitoring program will be implemented as outlined in Section 4.0 of Jagger Hims Limited report during the Codrington Pit development.

This memorandum is an addendum to our report dated March 30, 2009 and does not affect the general summary/recommendations of the report. Please call if you have any questions.

VGM:lnc

EXECUTIVE SUMMARY

St. Marys Cement Inc. (Canada), known locally as CBM Aggregates, is proposing to submit a Category 3 application under the Aggregate Resources Act (ARA) and its associated Provincial Standards. Approval for the application will permit the establishment of an above water table pit on lands referred to as the "Codrington Property," located east of the Village of Codrington, approximately 12 km north of Brighton. The property includes the land south of the Ontario Hydro Powerlines in Parts of Lot 32, 33, and 34, Concession 6 of the Township of Brighton (site).

To confirm the location of the seasonal high water level and to evaluate that the above-water extraction would have no adverse effects on the local groundwater and surface water resources, a Hydrogeological Study was undertaken by Jagger Hims Limited to meet and exceed the Provincial requirements as established by the ARA Provincial Standards. In addition, this Hydrogeological Study also addressed the requirements of the Township of Brighton Official Plan with respect to hydrogeological (groundwater) and hydrological (surface water) issues.

A sand and gravel unit (Unit 2) occurs across the southern portion of the site and achieves a confirmed maximum thickness of about 25 m within the south-central portion of the site. Unit 2 was not detected within the northwestern portion of the site. A unit of sand with minor gravel (Unit 3) occurs below Unit 2 and also extends below the northwestern portion of the site. Silt to silty sand (Unit 1) occurs at surface within the northwestern portion of the site and was confirmed to increase in thickness toward the northwest to a depth of about 17 m. This Unit 1 was not detected within the southern and eastern portions of the site.

The site is located within a high area of land that forms a regional recharge area for dominantly confined aquifers in the surrounding lower lying areas. Most water wells are developed in the confined aquifers at a depth greater than 15 m below ground surface. The

quantity of water available for domestic water supply wells will not be negatively affected by the pit development as the recharge to the aquifer developed by the local water wells is predicted to increase. In addition, there will be no negative impact from pit development on groundwater quality owing to the nature of the development, the on-site environmental management processes, the available attenuation capacity within the water table aquifer around the site, and since most water wells around the site are developed within an aquifer that is confined by overlying fine-grained deposits such as clay or hardpan.

Development of the site as an above the water table operation under a Category 3 Application will provide from 20 m to 30 m of available material west of the road allowance between Lots 32 and 33 and about 5 m to 25 m of material east of the road allowance. Within the northwestern portion of the Western Parcel the thickness of sand and gravel resources will range from approximately 14 m to approximately 17 m due to the occurrence of surficial silty deposits (Unit 1). Most of these surficial silty deposits are located within the area not proposed for extraction.

The base of excavation will be 1.5 m above the May 2008 groundwater table, which had an elevation of ±175 m above sea level (asl) within the central portion of Lots 33 and 32, falling off to below ±150 m asl in the northwest, ±155 m asl in the northeast, ±165 m asl in the southeast, and ± 160 m asl in the southwest. No negative effects to groundwater quality or quantity are predicted.

It is calculated that between about 11 and 14 million cubic metres of suitable material (Units 2 and 3) are available for extraction for the proposed pit design.

There is no notable groundwater contribution to the wetland within the north-central portion of the western portion of the site. Water accumulates within the wetland area during the spring and fall months as a result of surface water runoff, and slowly infiltrates through the underlying silt. As a result, temporary perched groundwater conditions occur

in this area. Pit development will reduce the amount of runoff to the wetland, which will reduce the depth and duration of ponded water (refer to Natural Environment report prepared by AECOM (formerly Gartner Lee Limited((2008) for further details). However, the net infiltration to groundwater in this area will be maintained.

A reduction in surface water runoff on the site will occur, but no negative effects to off-site surface watercourses are predicted as a result of increased infiltration. The contribution of groundwater baseflow to the watercourses will continue.

Based on the findings of the Hydrogeological Study, the above water table pit development and operations will not affect groundwater or surface water resources. A performance monitoring program is outlined in Section 4.0 of the report.

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1.0 INTRODUCTION

1.1 BACKGROUND

St. Marys Cement Inc. (Canada), known locally as CBM Aggregates, is proposing to open a sand and gravel pit, to be operated above the water table, on lands referred to as the "Codrington Property", located east of the Village of Codrington, approximately 12 km north of the Town of Brighton as shown on Figure 1. The property encompasses lands to the south of Ontario Hydro power-lines in Parts of Lots 32, 33, and 34, Concession 6, Township of Brighton (site).

Applications under the Aggregate Resources Act (ARA) and its Provincial Standards, as well as the Municipality of Brighton Official Plan and Zoning By-law, are required to open the proposed pit. Jagger Hims Limited has completed this Hydrogeological Study to provide the necessary hydrogeological (groundwater), hydrological (surface water), and geological information as required by the Provincial ARA application and municipal planning applications. The study was prepared essentially in accordance with the guidelines for a Hydrogeological Level 1 Technical Report, in accordance with the Aggregate Resources of Ontario Provincial Standards (AROPS). A Level 1 Report is mandatory for ARA licence applications where extraction is proposed from below the level of the water table. In the case of the Codrington Property, the pit is to be operated above the water table. Accordingly, this study exceeds the normal information requirements necessary under Provincial and municipal approval processes.

As part of this investigation, a number of boreholes were drilled and five monitoring wells installed, designated as BH05-2, BH05-18, BH05-19, BH05-20, and BH06-1. The borehole investigation determined that granular aggregate materials of economically viable quality/quantity exist above the water table at the site, to a maximum depth of approximately 24 to 25 metres below ground surface at the southwest portion of the site,

and approximately 11 metres below ground surface at the southeast portion. The pit operation would remain above the water table at these depths.

1.2 OBJECTIVES AND SCOPE

The primary purpose of the study is to address hydrogeological/hydrological information requirements established by the Municipality and the Province. As such, the objectives are as follows.

- To determine the existing elevations of the groundwater table within the site and to provide the final depth of excavation such that excavation terminates at least 1.5 metres above the water table.

- To identify existing surface water on and surrounding the site, storage and drainage features on the site, points of discharge to surface water, and possible interconnections between surface water and groundwater.

- To assess potential effects of pit excavation activities on local water resources and groundwater use.

- To provide the necessary information to determine any impacts on the natural environment from a hydrogeological/hydrological perspective.

1.3 METHODOLOGY

To obtain site-specific hydrogeologic information regarding the groundwater and surface water systems, possible groundwater and surface water interaction, and input to the pit development, the following activities were undertaken.

- The available topographic and geological mapping for the site area was reviewed and analyzed to interpret the hydrogeological conditions at the site.

- A historic geological report for the site area was reviewed for preliminary subsurface conditions.

- The MOE water well records for the site and surrounding area were collected and analyzed to determine groundwater depths, geologic profiles, historic water levels, and well yields.

- Two reconnaissance on-site visits were completed to identify the locations for the new boreholes and monitoring wells, and to investigate for seeps, springs, and other components of groundwater and surface water systems.

- Five (5) additional monitoring wells designated as BH05-2, BH05-18, BH05-19, BH05-20, and BH06-1 were installed in five boreholes drilled on the site between May 2005 and March 2006 to permit the establishment of the depth and elevation of the groundwater table, and the direction of groundwater movement. Borehole BH06-2 was drilled and decommissioned after analyses of the geological conditions in the southeast corner of the eastern parcel of the site.

- A survey was undertaken to establish monitoring well elevations to an on-site benchmark of 189.00 metres above sea level (m asl) for the ground surface at BH05-18. In April 2007, the monitoring well elevations were updated using the geodetic information provided by the 43 Degrees North.

- Groundwater levels were measured at monitors BH05-2, BH05-18, BH05-19, and BH05-20 in October 2005, January, March, April, and December 2006, April 2007, and May 2008 during seven monitoring events. In monitor BH06-1 groundwater

levels were measured in March, April, and December 2006, April 2007, and May 2008 during five monitoring events.

- A subcatchment analysis and a water balance assessment were completed for the low lying area on the site.

2.0 HYDROGEOLOGIC SETTING

2.1 TOPOGRAPHY AND PHYSIOGRAPHY

The site is located on a hill, which is approximately 2.5 km wide in an east-west direction and slightly longer in the north-south direction. The hill has a flattened top and is approximately 50 m higher than the surrounding sand plain. Regional mapping by Chapman and Putnam (1972), surficial geological mapping (Leyland and Mihychuk, 1984), and the Aggregate Resources Inventory (Rowell, 1997) indicate the presence of lacustrine sand and gravel in the investigated area.

For the convenience of the site description, it is considered that the site consists of two parcels: the Western parcel and the Eastern parcel divided by the road allowance between Lots 32 and 33, as shown in Figure 1.

The maximum elevation on the site is about 204 m asl in the western part of the Western parcel and the minimum elevation is about 180 m asl in the southeastern portion of the Eastern parcel. A low-lying area at an elevation of about 181 m asl is located in the north-central portion of the Western parcel and is identified to be seasonal wetland/pond on the topographic mapping. The northern limit of the site along the Ontario Hydro Easement varies between 180 to 195 m asl, and the southern limit varies between 180 and 195 m asl.

The Codrington area was influenced by a number of glacial and post-glacial events, and the topography is irregular and varied. During the Pleistocene (glacial) Epoch, the area was covered by a succession of ice sheets, which exceeded one kilometre in thickness. During the retreat and melting of the ice sheets, the ice split into several ice lobes, which behaved semi-independently. A northern ice lobe stood in the Rice Lake – Sterling area, and the Lake Ontario lobe was centred in the Lake Ontario basin. The Oak Ridges Moraine was formed between these two lobes, and the moraine is a major glacial and physiographic feature to the west of the Brighton area toward Toronto. Brighton is near the eastern extremity of the Oak Ridges Moraine, although the feature is poorly developed in this area and was eroded into several disconnected fragments.

The Oak Ridges Moraine and the drumlinized till plains to the north and to the south of the moraine were subjected to a variety of pro-glacial and post-glacial influences. During the waning of the ice, a number of glacio-fluvial ice-contact features, such as eskers and kames were deposited. Meltwater that flowed generally southward from the ice front often eroded previously existing landforms and/or deposited surficial outwash sand with occasional gravel. The site itself is not in the Oak Ridges Moraine physiographic region or the Oak Ridges Moraine Conservation Plan Area (ORMCPA).

A series of high level pro-glacial lakes existed in the area after the deposition of the major glacial landforms. The lakes formed adjacent to the ice lobes and numerous shorelines and sand plains were deposited at that time in the Brighton area. The lake deposits commonly were developed on, and overlie, previously existing deposits.

Lands within the study area are primarily undeveloped and consist of bush, sand/gravel highlands, and some farmlands.

2.2 GEOLOGY

2.2.1 Regional Geology

The available geological information for the Codrington area indicates that the surficial materials are lacustrine origin. These materials are several metres in thickness and they overlie some type of older deposits. Leyland and Mihychuk (1984) noted the presence of silt to sand till over much of the southern portion of the deposit, and this suggests that the Codrington hill is one of several flat-topped till mounds in the area.

The actual soil stratification was interpreted from the data obtained from MOE water well records and Jagger Hims Limited boreholes, which are shown on Figure 2. The regional cross sections A-A' and B-B', presented on Figures 3 and 4, reflect the regional geology. The site is located on a high area of land with near surface deposits of silt, sand, and gravel. Deeper units of fine-grained soil (clay, silt, and hardpan) are present and also occur near surface within the surrounding lower lying area. Surficial sand deposits also occur in the lower lying area. Bedrock was detected north of the site at a depth of about 12 m below ground surface, which corresponds to an elevation of about 115 m asl.

2.2.2 Local Geology

Thirty-seven test pits and seventeen boreholes were completed on the site in early 2005. Three additional boreholes were completed in late 2005 and two more in early 2006 (for total of 22 boreholes) to investigate local geological conditions. The interpretation of local geology suggests that the Codrington hill is an ice-contact or kame feature whose surface was modified by the later lacustrine events in the area. The 2005 and 2006 drilling results support the interpretation that Codrington hill is an ice-contact glaciofluvial deposit of significant thickness. The locations of the boreholes advanced during both drilling programs are shown on the Site Plan, Figure 5. The results of the drilling are detailed in the appended borehole logs of Appendix A and are summarized on Figures 6, 7, and 8.

The main finding of the drilling is that there are substantial amounts of sand and gravelly sand in the subsurface beneath the Codrington Property and that a large amount of this material is above the water table. A detailed analysis of the borehole results allows for the grouping of the material encountered into three major units.

Unit 1

Unit 1 includes silt till and silty fine sand that are generally in the order of about 5 m to 8 m thick, but were detected to be at least 11.9 m deep at BH05-15 and 16.8 m deep at BH05-16. This unit is prominent near surface in boreholes BH05-6, BH05-8, BH05-9, BH05-10, BH05-12, BH05-13, BH05-15, BH05-16, BH05-19, and BH05-20. A surficial 1.5 m thick portion of Unit 1 is located at BH05-4.

Unit 2

Unit 2 is the main sand and gravel unit present on the site. The unit is prominent at surface or below Unit 1 in the southern and eastern portions of the site. The material of Unit 2 is variable in texture and commonly ranges from fine to medium sand with some (20%) gravel to sand and gravel in approximately equal proportions. The gravel-rich areas appear as lenses or beds within the sand, and the gravel content is variable. The unit reaches a confirmed maximum thickness of 25 m in the south-central and eastern portion of the site near boreholes BH05-4, BH05-5, BH05-6, BH05-7, BH06-1, and BH06-2. There are several small inclusions of till and silt within Unit 2, which support the idea that much of this unit is ice-contact in origin. However, the upper few metres of material were likely wave-washed during the existence of Lake Iroquois in the area.

Unit 3

Unit 3 is generally fine to medium sand with an occasional lens (e.g. BH05-13) of coarser material. The unit is present at depth beneath much of the site and is generally regarded as marginal for use as aggregate due to its fine-grained texture and lack of gravel. Unit 3 is transitional with Unit 2 and essentially represents the gravel-poor phase of the combined unit.

Many of the boreholes encountered difficult drilling at the 25 m to 35 m depth. Boulders and/or a possible cemented layer were identified in several boreholes at the depth of approximately 30 m, and saturated sand was also encountered at a similar depth.

Two boreholes were advanced near the low-lying area in the north-central portion of the Western parcel of the site. BH05-19 was advanced to a depth of 29.6 m and intersected a shallow silt unit (Unit 1) from 0.6 to 8.2 m below ground surface. Owing to the potential for the silt unit to contain a perched water table, a second borehole BH05-20 was advanced within the southern portion of the low-lying area to a depth of 5.1 m and was completed as a standpipe monitoring well.

2.3 GROUNDWATER SETTING

2.3.1 Regional Groundwater Setting

Most of the water wells are located around the high area of land at a distance of more than 1 km from the site. The Ministry of the Environment (MOE) water well record locations are shown in Figure 2 and listed in Tables A-1 and A-2, Appendix A. A well record for the recently drilled water well located west of the site boundary is also presented in Appendix A. Two regional hydrogeological cross-sections A-A' and B-B' are presented in Figure 3 and Figure 4.

Based on the MOE water well records, most water wells are drilled wells that are developed within deep sand and/or gravel deposits greater than 15 m below ground surface. Some shallower water wells and dug wells are present. Around the high area of land, most water wells are developed within an aquifer that is confined by overlying fine-grained material such as clay or hardpan. It is anticipated that the clay identified in the well records is dominantly silt with different proportions of clay, and may be a fine-grained till.

The two well records for water supply wells in the high area of land (272 and A027288) indicate deep wells to about 40 m below ground surface. A027288 indicates confining layers of fine-grained material, with a perched water table at about 32 m below ground surface.

Groundwater levels in the water wells indicate higher groundwater elevations within the high land, with lower groundwater levels in water wells in the surrounding lower lying areas. Therefore, as expected, regional groundwater is inferred to move in a radial pattern from the high land toward the surrounding lower lying areas. Thus, the high land represents a regional groundwater recharge area.

Based on available data, local groundwater uses are for domestic purposes and some limited uses for livestock watering.

2.3.2 Site Hydrogeology

Groundwater levels were measured in the on-site monitoring wells BH05-2, BH05-18, BH05-19, and BH05-20 in October 2005, in January, March, April, and December 2006, in April 2007, and in May 2008. In monitor BH06-1, groundwater levels were measured in March, April, December 2006, in April 2007, and in May 2008. Monitors locations are shown on Figure 5. Monitor construction details are presented in Table B-1 and groundwater elevations are presented in Table B-2, Appendix B.

Groundwater levels within the deep monitoring wells in average fluctuated less than 0.75 m from October 4, 2005 to May 9, 2008. Considering that infiltration to the water table will naturally vary between the fall, winter, and spring, it is interpreted that the permeable soil permits the rapid dissipation of infiltration. Thus, the late spring water table conditions observed in May 2008 may be considered to represent the maximum water table elevation for the site at most locations. At BH05-18, the maximum water table elevation occurred in April 2007.

Figure 9 presents the maximum water table configuration observed for May 2008. As presented, the groundwater table is inferred to be highest in elevation with the central portion of the site below the area of high surface topography and where sand occurs near surface. Within the northwestern portion of the site, the fine-grained surficial material (silt and silty fine sand) prevents the rapid infiltration of water to the water table and thus prevents the establishment of high water table levels. The direction of groundwater movement is outward from the groundwater high toward the north, south, east, and west. As expected, no groundwater seeps or springs were identified on the site.

A seasonal perched groundwater table was detected near the wetland/pond area within the north-central portion of the Western parcel of the site at BH05-20. In October 2005, a water table was not detected, but from January 2006 through May 2008 the perched water table was within 0.5 m of ground surface. It is interpreted that the perched water table is formed as a result of the slow downward movement of groundwater through the underlying clayey silt. As shown in Figure 6, the clayey silt (Unit 1) is underdrained by the deeper unconfined water table.

Based on the water table configuration and the surrounding low areas, it is inferred that vertical hydraulic gradients are downward and the site is located in a groundwater recharge area.

2.4 SURFACE WATER

On a regional basis, there are few surface watercourses located within two kilometres of the site. One watercourse is Cold Creek, which is about 1 km south of the site and flows in an easterly direction. A tributary of Marsh Creek is located about 1 km west of the site and flows in a northerly direction toward Murray Marsh, which is located about 2 km northeast of the site. Tributaries of Marsh Creek and Murray Marsh are located within about 500 m east of the site. A permanent watercourse was identified about 50 m south from the southeast corner of the site, which slopes in an easterly direction. Based on the water table

elevation in this area as presented in Figure 9, there is a groundwater baseflow component to this watercourse. The groundwater also contributes to baseflow in watercourses located further removed from the site, such as Cold Creek and Marsh Creek.

There was no evidence of surface water on the site during September to November 2005, and from March 2006 to May 2008, except within the wetland area within the north-central portion of the Western parcel. The low-lying area contained some seasonal water accumulation of about 0.2 m depth in March 2006 and about 0.5 m in December 2006, April 2007, and May 2008 as a result of snowmelt and overland surface water runoff from the surrounding areas of higher topography as well as poor downward drainage due to the underlying lower permeability silt. From January 2006 through May 2008 the monitoring well at BH05-20 detected a perched water table within about half a metre below the ground surface. The highest level of perched water was detected at BH05-20 in May 2008, when the water table was within about 0.1 m from the ground surface.

2.5 CLIMATIC WATER BUDGET

The water balance for the study area was estimated using available climatic data from the on-line resources provided by Environmental Canada and the Ministry of the Environment (MOE) infiltration guidelines. The climatic water budget data from the local climatic station at Belleville are summarized in Tables C-1 and C-2, Appendix C. Based on the normal data for 1971 to 2000, the annual precipitation averages about 891.8 mm (mm/a). Considering available evapotranspiration of about 533.2 mm/a, the precipitation available for runoff or infiltration is about 358.6 mm/a.

As expected, a calculated water surplus occurs during the winter, spring, and fall months, with a water deficit during the summer months. It should be noted that the majority of water surplus in the winter accumulates as snow. Snowmelt during the spring results in the runoff or infiltration of precipitation that is effectively equivalent to the winter and spring water surplus.

2.6 SUBCATCHMENT ANALYSIS

To assess the contribution of precipitation to groundwater and surface water, and to obtain the data required for an environmental impact assessment of the proposed pit development, a subcatchment analysis was performed for the site.

The site was partitioned into three catchment areas for: 1) the on-site wetland, 2) Cold Creek, and 3) Marsh Creek. Each catchment area was then subdivided into subcatchment areas based on the proposed pit excavation boundaries and buffers as shown in Figure 10. The infiltration and runoff rates were calculated for each of these subcatchments. A summary of the water balance for subcatchments under pre-development and post-development conditions is provided in Table 1.

The proposed site development will shift portions of the surface water flow divides for local subcatchments. The following subcatchments will change drainage areas to which they contribute; unlisted areas will not change.

SUBCATCHMENT AREA	PRE-DEVELOPMENT DRAINAGE	POST-DEVELOPMENT DRAINAGE DIRECTION
1A	Wetland/Pond	Groundwater
1B	Wetland/Pond	Groundwater*
1C	Wetland/Pond	Groundwater*
1D	Wetland/Pond	Groundwater*
1E	Wetland/Pond	Groundwater
1G	Wetland/Pond	Groundwater*
2A	Cold Creek	Groundwater
3A	Marsh Creek	Groundwater
3E	Marsh Creek	Groundwater
3G	Marsh Creek	Groundwater

NOTE: * indicates that the runoff component will be toward the excavation and will infiltrate as groundwater within the excavation.

Infiltration and runoff for each subcatchment was calculated using the method of Table 2 in the Hydrogeologic Information Requirements (MOE, 1995), with some adjustments for site conditions. Runoff was calculated as the difference between moisture surplus and infiltration.

The following are detailed comments on the infiltration calculations that were completed for the site.

- Input values for Table 1 subfactors are based on available information for soil and groundwater conditions. For subcatchments without direct subsurface information, conditions were inferred from the nearest borehole/monitoring well.

- The subcatchment areas were calculated based on the indicated boundaries shown in Figure 10. Water balance calculations were completed for above groundwater table extraction on the area of development.

- The moisture surplus used in the calculations was derived from the long-term climatic average conditions, based on records between 1971 and 2000. Monthly evapotranspiration values were calculated using the Thornthwaite and Mather method (1957) that included a daylight correction for latitude.

- For the wetland/pond an infiltration factor of 1 was considered for direct precipitation and runoff as water will accumulate and eventually infiltrate into the subsurface and contribute to groundwater. Open water evaporation was assumed to be similar to the calculated evapotranspiration.

- The area covered with wetland was assumed to provide a similar infiltration factor for pre-development and post-development conditions.

A summary of the site water balance for pre-development and post-development conditions is provided in Table 1. The primary data for the site water balance calculations is shown in Table C-3, Appendix C.

For the majority of the site the infiltration rate varied between 70% and 80% of the water surplus for an infiltration coefficient of 0.7 to 0.8. Therefore, a runoff coefficient of between 0.2 and 0.3 was estimated for the site for pre-development conditions. Thus, an annual runoff between 72 and 108 mm/a and an annual infiltration between 251 and 287 mm/a are reasonable. One exception is for the wetland area within the north-central portion of the Western parcel of the site, where an infiltration rate of 100% was estimated. Due to the site topography in this area, the water surplus that accumulates in the wetland area eventually infiltrates into the underlaying soil which results in localized seasonal perched groundwater conditions.

3.0 IMPACT ASSESSMENT

3.1 PROPOSED OPERATIONS

CBM Aggregates proposes to operate the pit as an above the water table operation. In accordance with the ARA Provincial Standards, this operation requires that the base of the pit must be greater than 1.5 m above the water table. As noted in Section 2.3, water table levels in average fluctuated by less than 0.75 m from October 2005 through May 2008, and the late spring water table conditions observed in May 2008 may be considered to represent the maximum water table elevation for the site at most locations. At BH05-18 the maximum water table elevation occurred in April 2007.

Groundwater monitors BH05-18 and BH05-19 indicate that the depth to the water table within the southwestern portion of the site is between about 23.9 to 25.2 m below ground surface. Within the southeastern portion of the site in the vicinity of BH05-2 the water

table is about 10.0 m below ground surface, while within the eastern portion of the site in the vicinity of BH06-1 the water table is about 7.0 m below ground surface.

The following table provides an assessment of the extractable material at the site with respect to the above water table criterion. It is noted that the extractable material includes material from Units 1, 2, and 3 as defined in Section 2.2. Depending on the elevation of surface topography and the water table, there are localized areas of greater or lesser extractable material.

COMPARISON OF WATER TABLE AND EXTRACTABLE MATERIAL

MONITOR DESIGNATION	DEPTH TO WATER TABLE (m bgl)	SOIL THICKNESS ABOVE WATER TABLE (m bgl)	THICKNESS OF EXTRACTABLE MATERIAL (m)
BH05-2	10.0	10.0	8.5
BH05-18	23.9	23.9	22.4
BH05-19	25.2	25.2	23.7
BH06-1	7.0	7.0	5.5

NOTES:
1) 'm bgl' indicates metres below ground level.
2) 'm' indicates metres.
3) Water table depth based on maximum elevations (April 2007 or May 2008).
4) ARA/Standards Criterion is a base excavation 1.5 m above water table.

In summary, the greatest thickness of extractable material occurs in the area of higher surface topography west of the road allowance between Lots 32 and 33 (Western parcel). However, it is noted that northwest of BH05-9 the surficial unit of silt to silty fine sand (Unit 1) ranges in thickness from about 4.6 m to 8.2 m, with greater than 11.9 to 16.8 m of Unit 1 at BH05-15 and BH05-16, respectively. See Figure 5 for location details.

Based on the May 2008 water table configuration presented in Figure 9, the pit average base elevation will be about 177.1 m asl (175.6 m asl + 1.5 m) within the central portion of the site and may vary along the site perimeter as detailed in the following table. It is noted that the pit base elevation presented for BH05-18 is based on the April 2007 data, which recorded the maximum water table elevation of all the monitoring events.

MONITOR DESIGNATION	GROUND SURFACE ELEVATION (m asl)	PIT BASE ELEVATION (m asl)
BH05-2	184.8	176.3
BH05-18	191.0	168.6
BH05-19	185.0	161.3
BH06-1	182.6	177.1

Based on the data obtained during the subsurface investigations and groundwater monitoring program, the quantity of the aggregate resources available for extraction was calculated. The calculations were completed for the two scenarios: Scenario I with a vertical slope of extraction, and Scenario II with extraction with a slope ratio of 3:1 (horizontal : vertical). In both scenarios the volumes of resources available for extraction were calculated with consideration of the three phases of the pit development. The calculations results are summarized below.

SCENARIO #	MATERIAL VOLUME (m^3)			
	PHASE I	PHASE II	PHASE III	TOTAL
Scenario I: Vertical Slopes	**6,398,433**	**3,898,449**	**10,235,889**	**20,532,771**
Topsoil and silt (Unit 1)	1,147,203	920,484	4,125,169	**6,192,856**
Sand and gravel (Units 2 and 3)	5,251,230	2,977,965	6,110,720	**14,339,915**
Scenario II: Slopes at 3:1	**4,816,017**	**2,269,863**	**8,160,669**	**15,246,549**
Topsoil and silt (Unit 1)	652,698	557,442	3,048,921	**4,259,061**
Sand and gravel (Units 2 and 3)	4,163,319	1,712,421	5,111,748	**10,987,488**

In the event that material washing operations are considered as part of the site operations, Section 3.3 provides a summary of surface water available for on-site storage. If groundwater is required to supplement the surface water storage, a Permit To Take Water may be required.

A minor groundwater supply will be required for dust control and for periodic watering of trees to be planted as part of the site rehabilitation program. As the predicted maximum water requirement will not exceed 50,000 L/day, a Permit To Take Water will not be required. Water will either be obtained from an off-site source or from an on-site water

supply well located within the northern portion of the Western parcel of the site, which is not proposed for extraction.

3.2 GROUNDWATER ASSESSMENT

According to common industry findings for above water table pit development and based on Jagger Hims Limited's 20 years of experience in extensive groundwater monitoring at similar pits, above water table extraction is not known to negatively affect groundwater resources. However, to meet and exceed the Provincial requirements as established by the ARA Provincial Standards, a detailed groundwater assessment was completed to evaluate the possible effects of the above water table extraction on groundwater resources.

Based on the available area for pit development south of the Ontario Hydro Easement and estimated setbacks, a pit area of about 81 ha is estimated. The total infiltration volume for the property in pre-development conditions is about 284,805 m^3/a, with about 94,126 m^3/a of runoff. Development of the pit will prevent runoff within the pit area and some adjacent subcatchment areas, and re-direct the runoff to infiltration through the permeable sandy soil. Therefore, the infiltration volume in post-development conditions will be about 356,954 m^3/a. As such, the post-development conditions will be characterized with an increase in infiltration to the groundwater table of about 72,162 m^3/a.

The predicted increase in infiltration of water surplus to the groundwater table will maintain the groundwater recharge characteristics of the site. It is predicted that the pre-development water table high within the central portion of the site will be maintained and may increase by about 0.1 m to 0.2 m upon completion of the excavation as a result of the increase in infiltration. As such, shallow groundwater will continue to move from the site in a radial direction toward the low-lying areas that surround the site. Downward hydraulic gradients through the underlying low permeable units will maintain the quantity of water currently available to local water wells around the site.

Based on groundwater information collected from October 2005 to May 2008, there is no notable shallow groundwater contribution to the wetland area within the north-central portion of the Western parcel. Water accumulates within the low-lying area during the spring and fall months as a result of surface water runoff, and slowly infiltrates through the underlying silt.

Water quality impacts are not anticipated and operation of the pit in accordance with prescribed conditions and Technical Standards and Safety Authority (TSSA) requirements will protect water quality. The sandy soil and attenuation capacity around the site will also prevent detectable changes in suspended solids or temperature within the shallow groundwater beyond the 120 m zone around the property as shown in Figure 10.

The watercourse southeast of the property is about 90 m from the edge of the excavation. Considering the lateral hydraulic gradient (0.017 m/m), a range of reasonable bulk hydraulic conductivities for the soil (10^{-4} to 10^{-3} m/s), and a soil porosity of 30%, groundwater movement from the excavation to the watercourse would take about 18 to 180 days, which should provide sufficient time for the infiltration to equilibrate to normal groundwater temperatures. In addition, the low permeable units that protect the deeper sand and gravel aquifers will not be compromised by the pit development.

In summary, it is predicted that the development of a pit on the site will not result in adverse effects to the local groundwater quantity or quality. Groundwater monitoring is recommended in Section 4.0 of this report to confirm acceptable groundwater conditions, and this monitoring program will be included on the ARA Site Plan for the proposed pit.

3.2.1 Effects on Local Water Wells

The results contained in Section 3.2 indicate that the regional groundwater table will not be adversely affected by pit excavation. This assessment is consistent with the research

findings published by the Ministry of Natural Resources in the document entitled Applied Research On Source Water Protection in the Aggregate Industry.

The pit excavation has no predicted negative effects on groundwater quantity or quality. In fact, it will increase the overall recharge to the aquifer. As such, there will be no negative effects of the proposed excavation on the local groundwater users. Correspondingly, the closest water well, which is located downgradient from the western site boundary at a distance of about 20 m, will not be negatively affected by the proposed pit development.

3.3 SURFACE WATER ASSESSMENT

Considering the method of extraction above the groundwater table, the plan to keep a "no extraction zone" in the northwest corner of the site, the distance to the nearest surface watercourses, and a predicted increase in groundwater recharge, no negative effects to local watercourses are expected from the pit operations.

A reduction in runoff on the site and toward the site boundaries is predicted. The runoff to the on-site wetland located within the north-central portion of the Western parcel is predicted to be about 77% less than pre-development conditions. As a result, the depth and duration of the ponded water in the wetland will be reduced. However, as the wetland represents a groundwater recharge feature and the reduced runoff corresponds to an increase in infiltration, no negative effects to groundwater quantity or quality are predicted in this area. Impacts on the wetland are further reviewed in the Natural Environment report prepared by AECON (formerly Gartner Lee Limited) (2008).

Runoff from the site toward Cold Creek will decrease by about 80% with the proposed extraction area. This runoff reduction is minor compared to the overall watershed area for Cold Creek and considering the surficial sand and gravel south of the site where most runoff will infiltrate into the groundwater. In addition, the corresponding increase in

infiltration will enhance the southerly groundwater movement and the baseflow contribution to the creek.

Within the northern and eastern portions of the site, the component of runoff toward Marsh Creek will decrease by about 70%, while the overall infiltration to groundwater will increase. As noted above, the resultant groundwater baseflow to the local watercourses compensate for the reduced runoff.

The volume of surface water available for storage and use for material washing as part of site operations will depend on the surface area and design of on-site storage/settlement ponds. The permeability of the sandy soil requires that the ponds be designed with a low permeable base of on-site silty soil. In addition, the settlement of fines will enhance the retention capability of the ponds. Assuming that evaporation from the ponds will be similar to the estimated evapotranspiration rates, a lined pond should provide water at a rate of about 0.36 $m^3/a/m^2$ of pond area. Most water accumulation in the ponds will occur during the spring months.

No off-site discharge of water from the storage/settlement ponds will be required. Excess water may be directed to the wetland/pond for infiltration to the groundwater table.

4.0 PERFORMANCE MONITORING PROGRAM

Development of the pit as an above the water table operation will not have a negative effect on local groundwater or surface water resources. However, it is recommended that the following performance monitoring program be implemented to confirm acceptable conditions and to provide input to contingency measures, if required.

Considering the proposed extraction area, monitoring wells BH05-19 and BH05-20 should be decommissioned in accordance with the regulatory requirements.

The performance monitoring program should include the following.

- Groundwater Level Monitoring – Complete at BH05-2, BH05-18, and BH06-1 on a quarterly basis over the calendar year.

- Baseline Groundwater Quality Monitoring – Complete one monitoring event at BH05-2, BH05-18, and BH06-1 prior to extraction for the following parameters: pH, conductivity, turbidity, temperature, and total dissolved solids.

- Annual Reporting – Prepare an annual monitoring report by March 31 of each year to summarize the monitoring results of the preceding year. The report should document complaints and responses.

- Groundwater quality sampling should be completed once, prior to commencement of pit operations. The groundwater level monitoring should be completed annually on a quarterly basis.

It is predicted that an above the water table pit operation will have no negative affects on groundwater and surface water resources.

4.1 CONTINGENCY MEASURES

If groundwater levels at BH05-2, BH05-18, and BH06-1 decrease by 2 m relative to baseline conditions, a detailed review of data collected for the site to determine the cause should be completed.

If the water level decrease is a result of site operations, increase the scope of the performance monitoring program to include residential wells within 100 m of the site and the watercourse southeast of the site. Monitoring should include annual quality tests for the baseline parameters and quarterly levels.

If pit operations are determined to negatively affect groundwater or surface water resources, the following contingency measures should be implemented.

1. Interference with acceptable quality or quantity of water in a water well should result in provision of an acceptable water supply by either installation of a new water well or a suitable alternative.

2. Negative effects on the watercourse should be remediated by changes in site operations or through site rehabilitation.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The results of this Hydrogeologic Study indicate that no negative effects to the groundwater and surface water regimes are predicted as summarized below.

- A sand and gravel unit (Unit 2) occurs across the southern portion of the site and achieves a confirmed maximum thickness of about 25 m within the south-central portion of the site. The underlying sand unit (Unit 3) contains less gravel. Within the northwest portion of the site a silt to silty sand unit (Unit 1) occurs at surface and is generally 5 m to 8 m in thickness, but was detected to a depth of about 17 m at one borehole location.

- The wetland within the north-central portion of the Western parcel of the site is located in an area with a surficial silt layer (Unit 1) that is about 8 m in thickness, but thickens toward the northwest.

- The site is located within a high area of land that forms a regional recharge area for dominantly confined aquifers in the surrounding lower lying areas. Most water wells are developed in confined aquifers at a depth greater than 15 m below ground

surface. The quantity of water available for domestic water supply wells will not be negatively affected by the pit development as the recharge to the aquifer developed by the local water wells is predicted to increase. In addition, there will be no negative impact from pit development on groundwater quality owing to the nature of the development, the on-site environmental management processes, and the available attenuation capacity within the water table aquifer around the site. Most water wells around the site are developed within an aquifer that is confined by overlying fine-grained deposits such as clay or hardpan.

- Development of the site as an above the water table operation under a Category 3 Application will provide from 20 m to 30 m of available material west of the road allowance between Lots 32 and 33 (Western parcel) and about 5 m to 25 m of material east of the road allowance (Eastern parcel). Within the northwestern portion of the Western parcel the thickness of sand and gravel resources will range from approximately 14 m to approximately 17 m due to the occurrence of surficial silty deposits (Unit 1). Most of these surficial silty deposits are located within the area not proposed for extraction.

- It is calculated that between about 11 and 14 million cubic metres of suitable material (Units 2 and 3) are available for extraction for the proposed pit design.

- The base of excavation will be 1.5 m above the May 2008 groundwater table, which had an elevation of ±175 m above sea level (asl) within the central portion of Lots 33 and 32, falling off to below ±150 m asl in the northwest, ±155 m asl in the northeast, ±165 m asl in the southeast, and ± 160 m asl in the southwest.

- Pit development will increase the groundwater recharge in the area. No negative effects to groundwater quality or quantity are predicted. Similarly, water wells in the area will not be negatively affected by the pit development.

- There is no notable groundwater contribution to the wetland within the Western parcel of site. Water accumulates within the wetland during the spring and fall months as a result of surface water runoff, and slowly infiltrates through the underlaying silt. As a result, temporary perched groundwater conditions occur in this area. Pit development will reduce the amount of runoff to the wetland, which will reduce the depth and duration of ponded water. However, the net infiltration to groundwater in this area will be maintained.

- A reduction in surface water runoff on the site will occur, but no effects to off-site surface watercourses are predicted as a result of increased infiltration. The contribution of groundwater baseflow to the watercourses will continue.

The following recommendation is provided for consideration.

- The performance monitoring program should be implemented as outlined in Section 4.0.

Yours truly,
JAGGER HIMS LIMITED

Vyacheslav G. Magmedov, Ph.D., P.Geo.
Project Manager

Jason T. Balsdon, M.A.Sc., P.Eng.
Consulting Engineer

6.0 REFERENCES

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Map. NTS 1:50,000, Sheet 31C/04, Trenton, NAD 27, Zone 18

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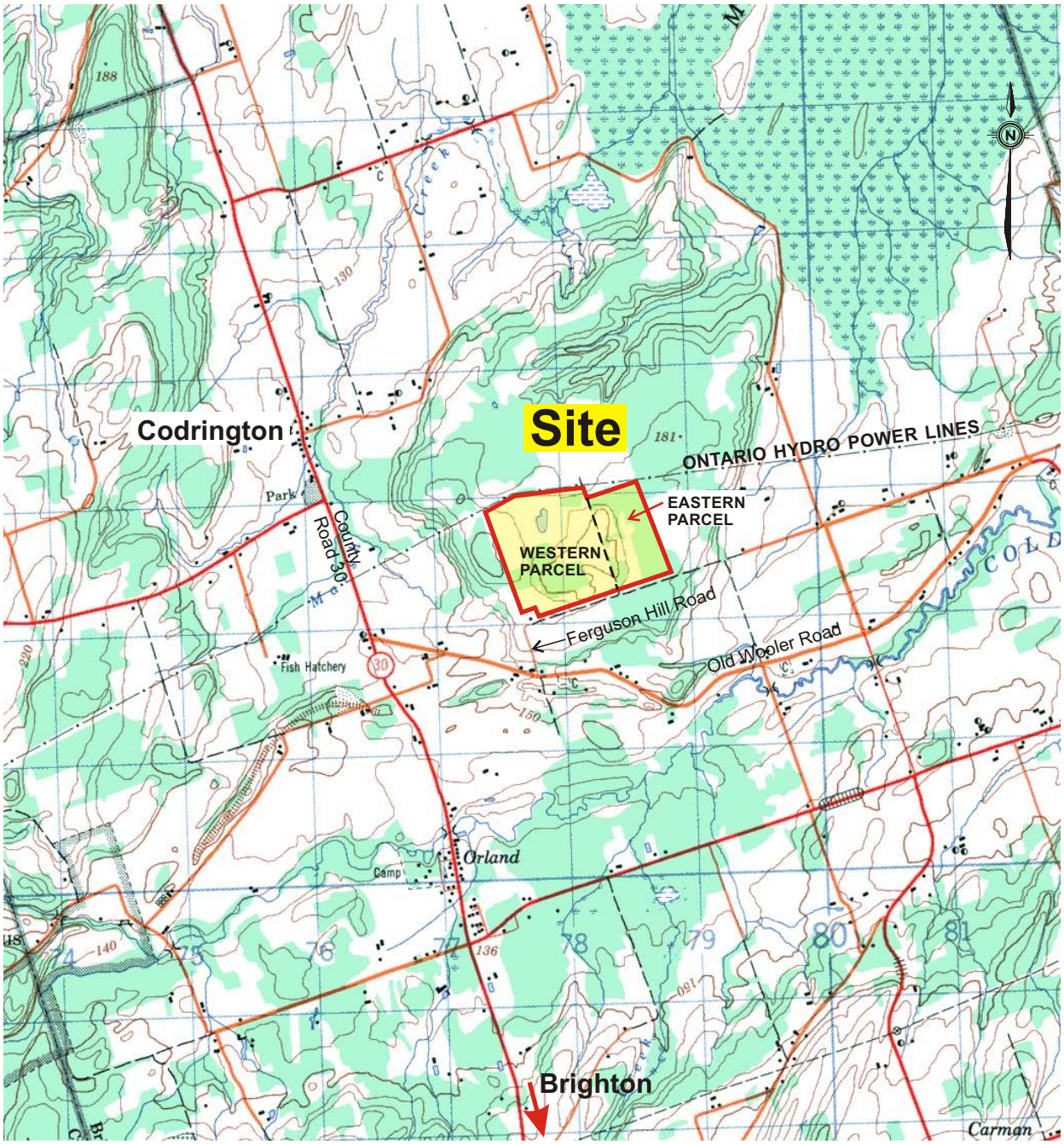


LEGEND

SITE LOCATION

ROAD ALLOWANCE BETWEEN LOTS 32 AND 33

MAP SOURCE:
NTS 1:50,000 SHEET 31C/04, TRENTON, NAD 27 ZONE 18.

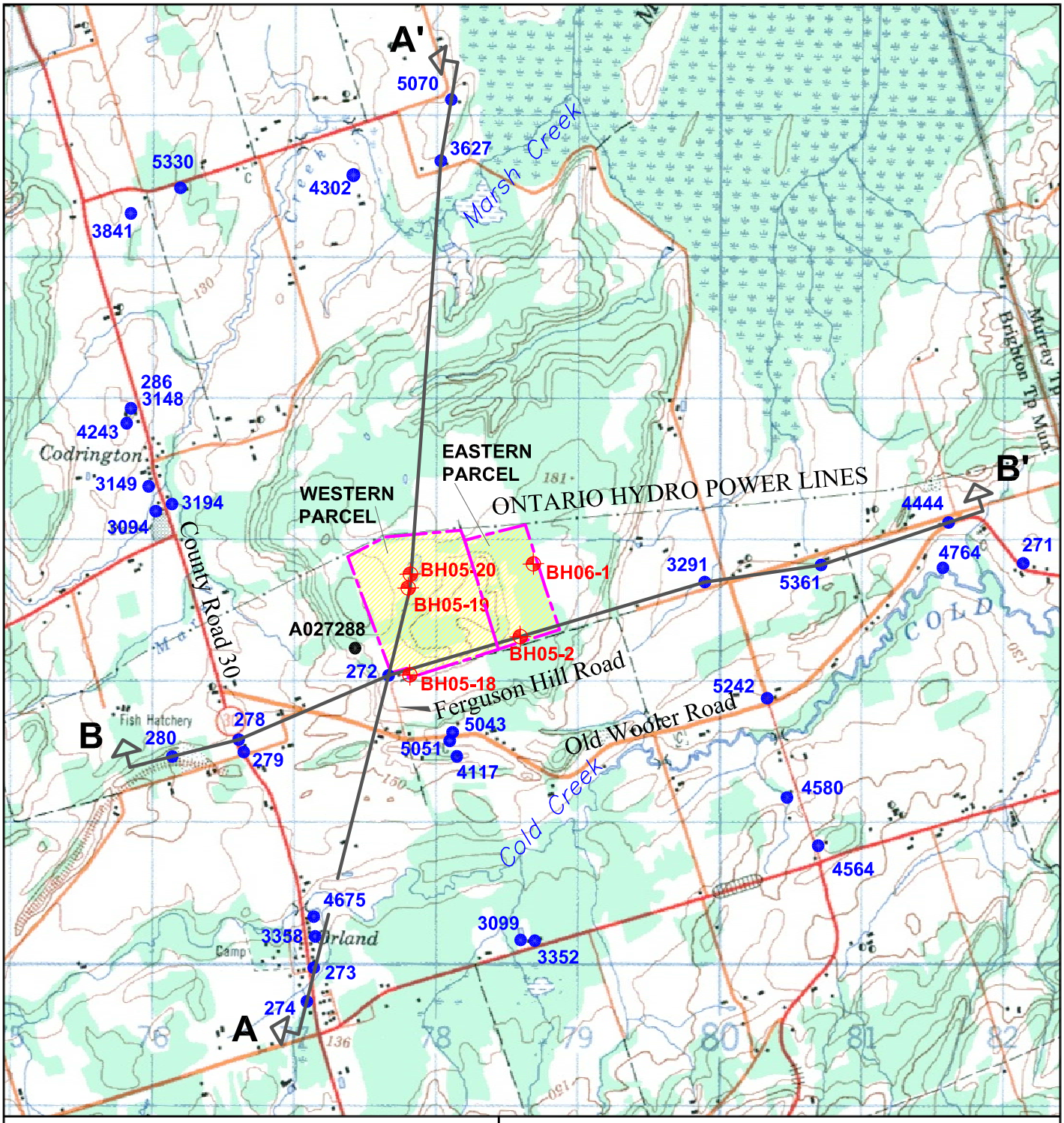
LOCATION MAP

HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALE: 1:50,000
PROJECT: 051777.00	REF. NO.: 0-05177700 F1-LM

JAGGER HIMS LIMITED
Environmental Consulting Engineers

FIGURE 1



Legend

- SITE LOCATION
- 3291 — MOE BOREHOLE LOCATION AND DESIGNATION
- BH05-2 — JAGGER HIMS LIMITED MONITORING WELL LOCATION AND DESIGNATION
- A027288 — NEW WATER WELL LOCATION AND DESIGATION
- A — CROSS SECTION LOCATION

400 0 800 m

MAP SOURCE:
NTS 1:50000 SHEET 31C/04, TRENTON, NAD 27, ZONE 18.

JAGGER HIMS LIMITED MONITORING WELL/MOE WATER WELL LOCATIONS

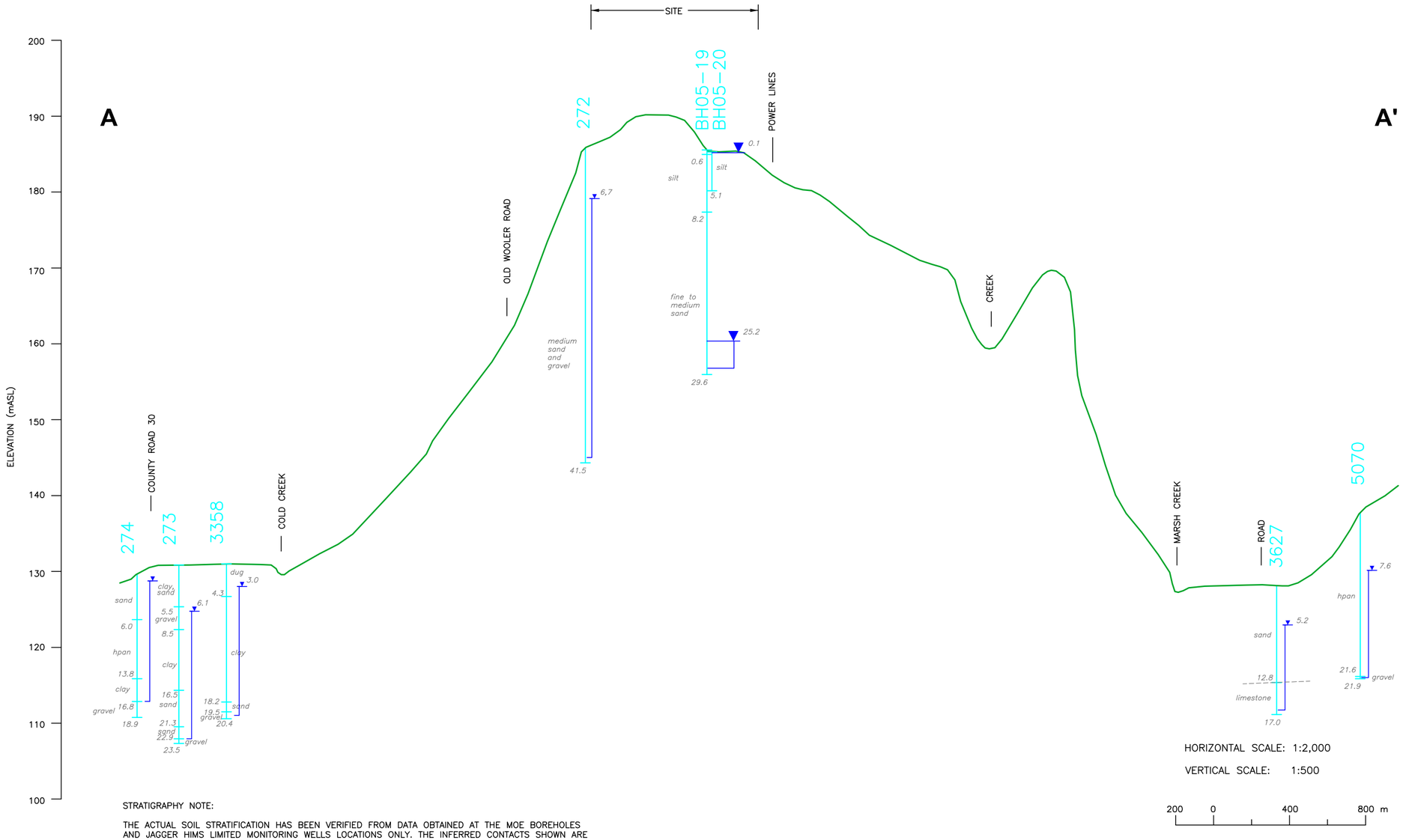
HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALE: 1:40000
PROJECT: 051777.00	REF. NO.: 0-05177700F2-LM

JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 2

LOOKING WEST



Legend

- 3627 — MOE WATER WELL DESIGNATION
- GROUND SURFACE
- 5.2 — WATER TABLE (m below ground surface) AT THE TIME OF CONSTRUCTION
- 12.8 — CHANGE IN STRATIGRAPHY (m below ground surface)
- 17.0 — END OF HOLE (m below ground surface)
- BH05-19 — JAGGER HIMS LIMITED MONITORING WELL LOCATION AND DESIGNATION
- STATIC WATER LEVEL IN JAGGER HIMS LIMITED MONITORING WELL, MAY, 2008

HORIZONTAL SCALE: 1:2,000

VERTICAL SCALE: 1:500

200 0 400 800 m

STRATIGRAPHY NOTE:

THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE MOE BOREHOLES AND JAGGER HIMS LIMITED MONITORING WELLS LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SHOWN BETWEEN BORINGS.

CROSS SECTION A-A'

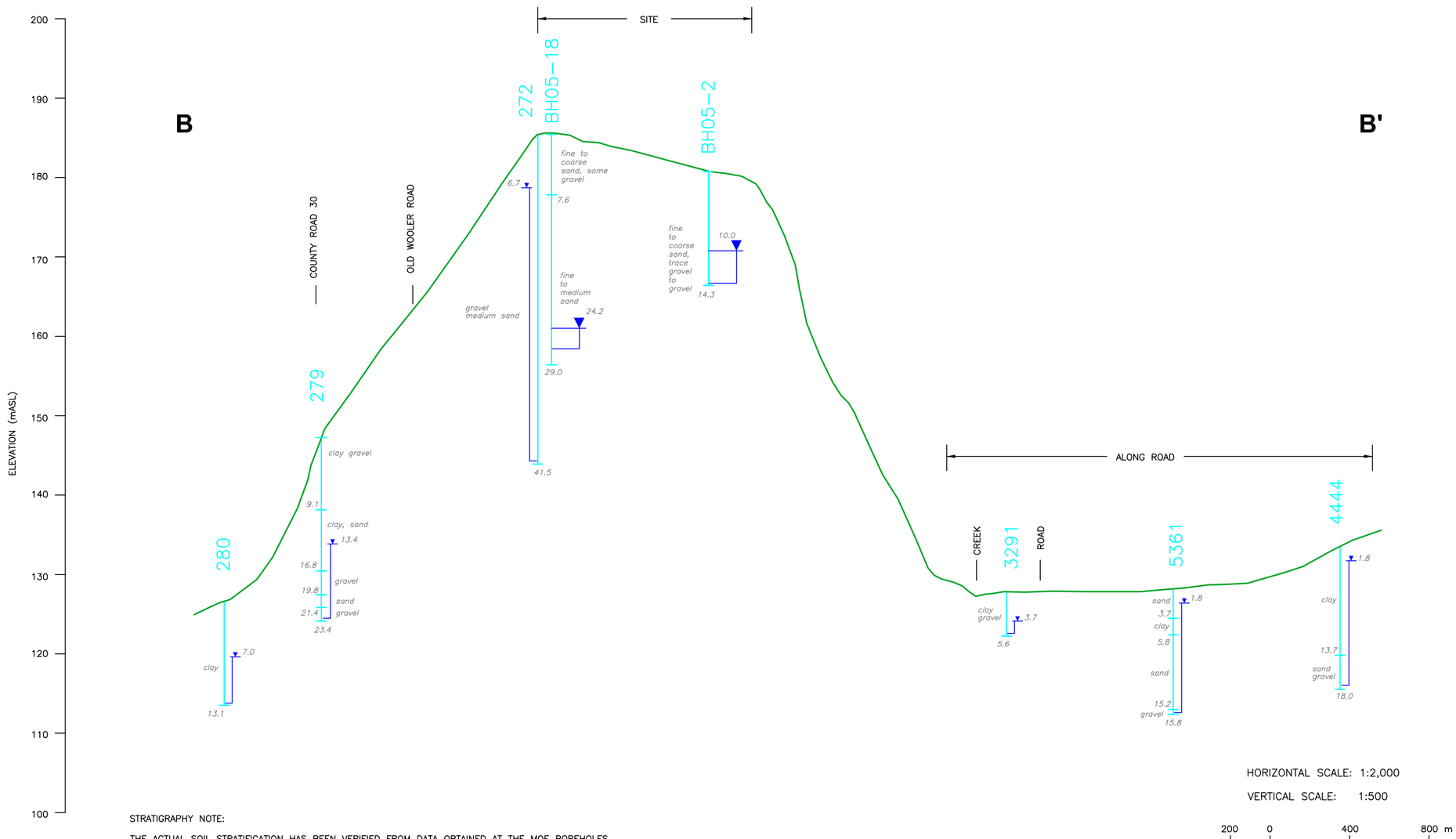
HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALES: AS SHOWN
PROJECT: 051777.00	FILE NO.: 0-05177700F3-CR

JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 3

LOOKING NORTH



Legend

- 3627 — MOE WATER WELL DESIGNATION
- GROUND SURFACE
- 5.2 — WATER TABLE (m below ground surface) AT THE TIME OF CONSTRUCTION
- 12.8 — CHANGE IN STRATIGRAPHY (m below ground surface)
- 17.0 — END OF HOLE (m below ground surface)
- BH05-19 — JAGGER HIMS LIMITED MONITORING WELL LOCATION AND DESIGNATION
- STATIC WATER LEVEL IN JAGGER HIMS LIMITED MONITORING WELL, MAY, 2008

HORIZONTAL SCALE: 1:2,000

VERTICAL SCALE: 1:500

200 0 400 800 m

STRATIGRAPHY NOTE:

THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE MOE BOREHOLES AND JAGGER HIMS LIMITED MONITORING WELLS LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SHOWN BETWEEN BORINGS.

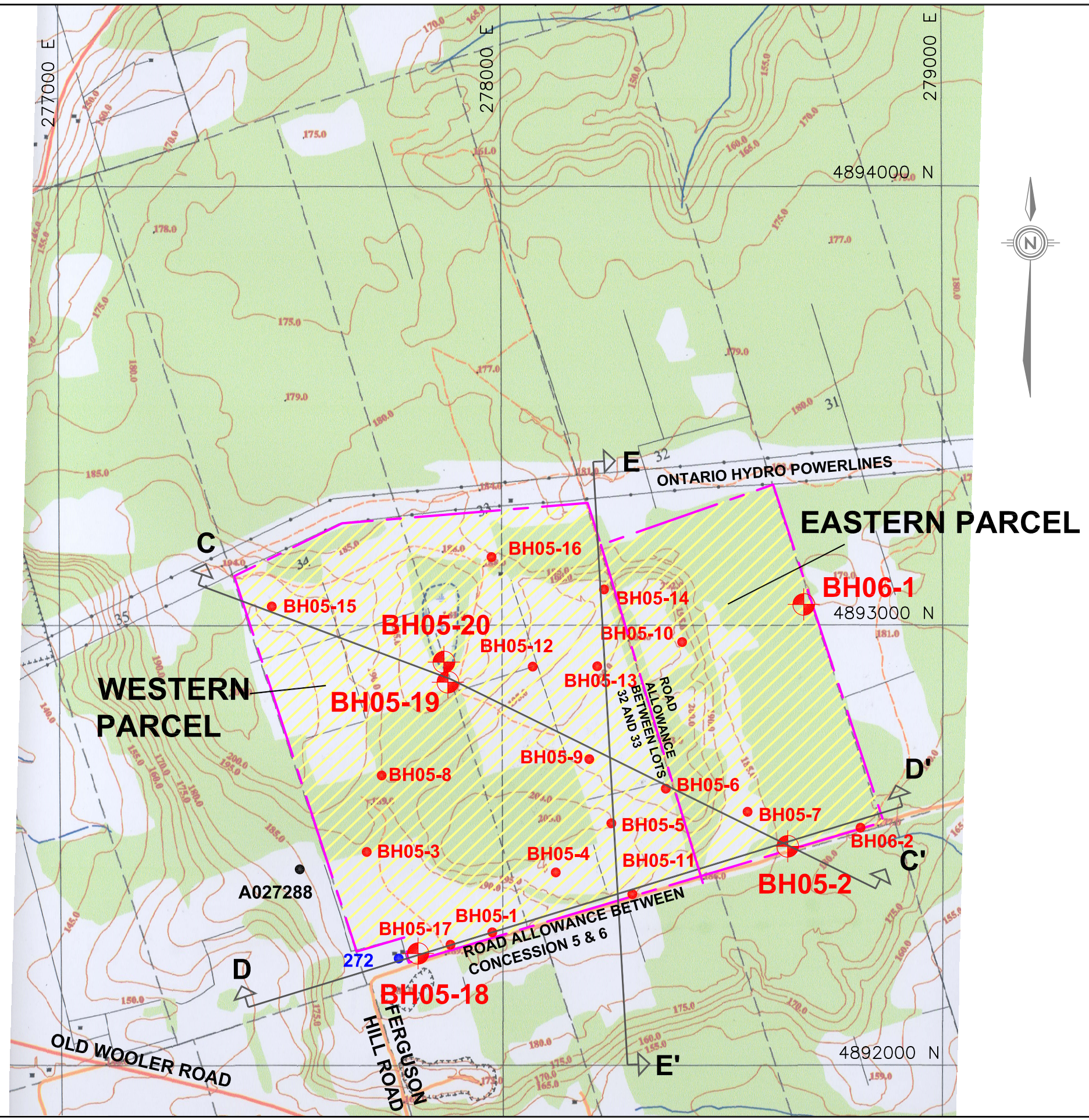
CROSS SECTION B-B'

HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALES: AS SHOWN
PROJECT: 051777.00	FILE NO.: 0-05177700F4-CR

JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 4



Legend

- PROPERTY BOUNDARY (APPROXIMATE)
- BH05-1 — BOREHOLE LOCATION AND DESIGNATION
- BH05-2 — MONITORING WELL LOCATION AND DESIGNATION
- A027288 — NEW WATER WELL LOCATION AND DESIGANTION
- 272 — MOE WATER WELL LOCATION AND DESIGNATION
- A' — CROSS SECTION

100 0 200 m

MAP SOURCE:
MAP FROM MNR 10 18 275048900, NAD 83.

SITE PLAN

HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALE: 1:10,000
PROJECT: 051777.00	REF. NO.: 0-05177700F2-SP

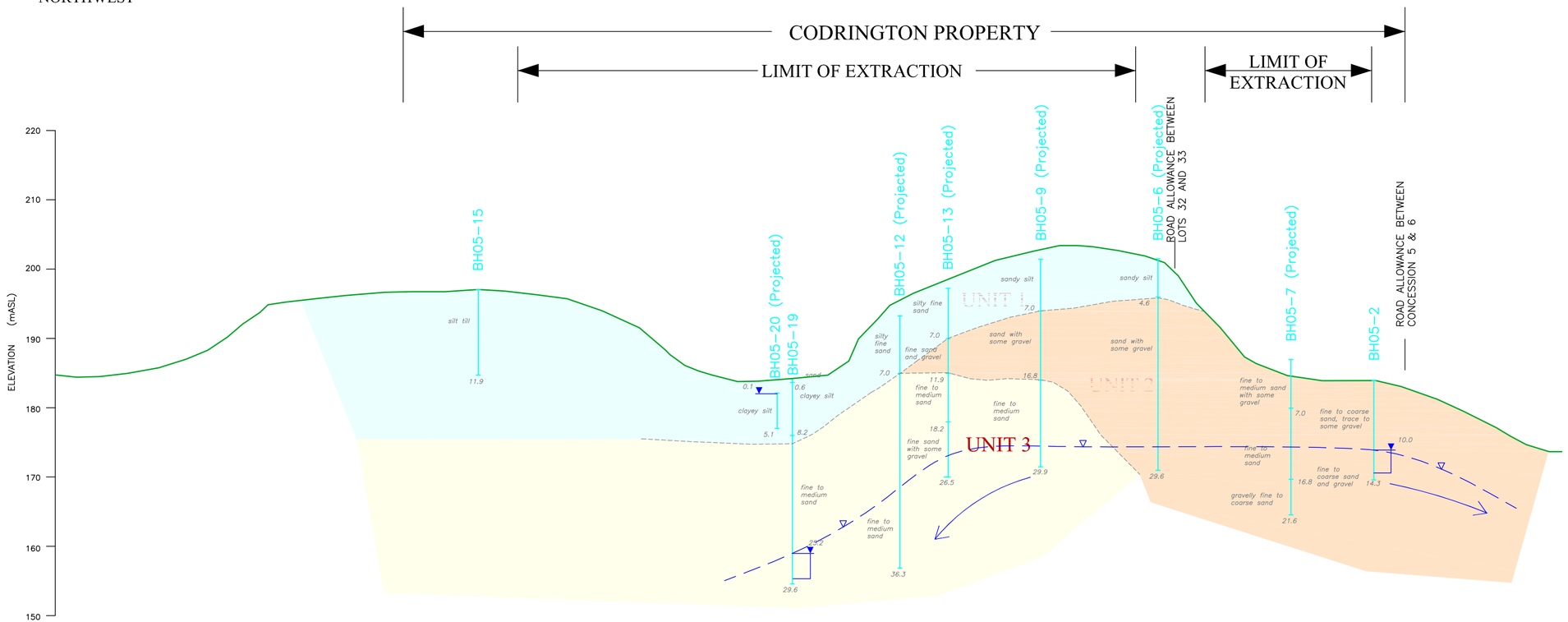
JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 5

C
NORTHWEST

LOOKING NORTHEAST

C'
SOUTHEAST



Legend

- BH05-2 — BOREHOLE DESIGNATION
- GROUND SURFACE (APPROXIMATE)
- CHANGE IN STRATIGRAPHY
- INFERRED WATER TABLE MAY, 2008
- END OF HOLE
- STATIC WATER LEVEL IN JAGGER HIMS LIMITED MONITORING WELL, MAY, 2008
- INFERRED DIRECTION OF GROUNDWATER MOVEMENT
- UNIT 1: silt, sitly fine sand and till
- UNIT 2: sand, gravelly sand and sand and gravel.
- UNIT 3: sand, minor gravel

HORIZONTAL SCALE 1:5000
VERTICAL SCALE 1:500

50 0 100 metres

STRATIGRAPHY NOTE:

THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE JAGGER HIMS LIMITED BOREHOLE LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SHOWN BETWEEN BORINGS.

CROSS SECTION C-C'

HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALES: AS SHOWN
PROJECT: 051777.00	FILE NO.: 0-05177700F6-XSA

JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 6

D
WEST

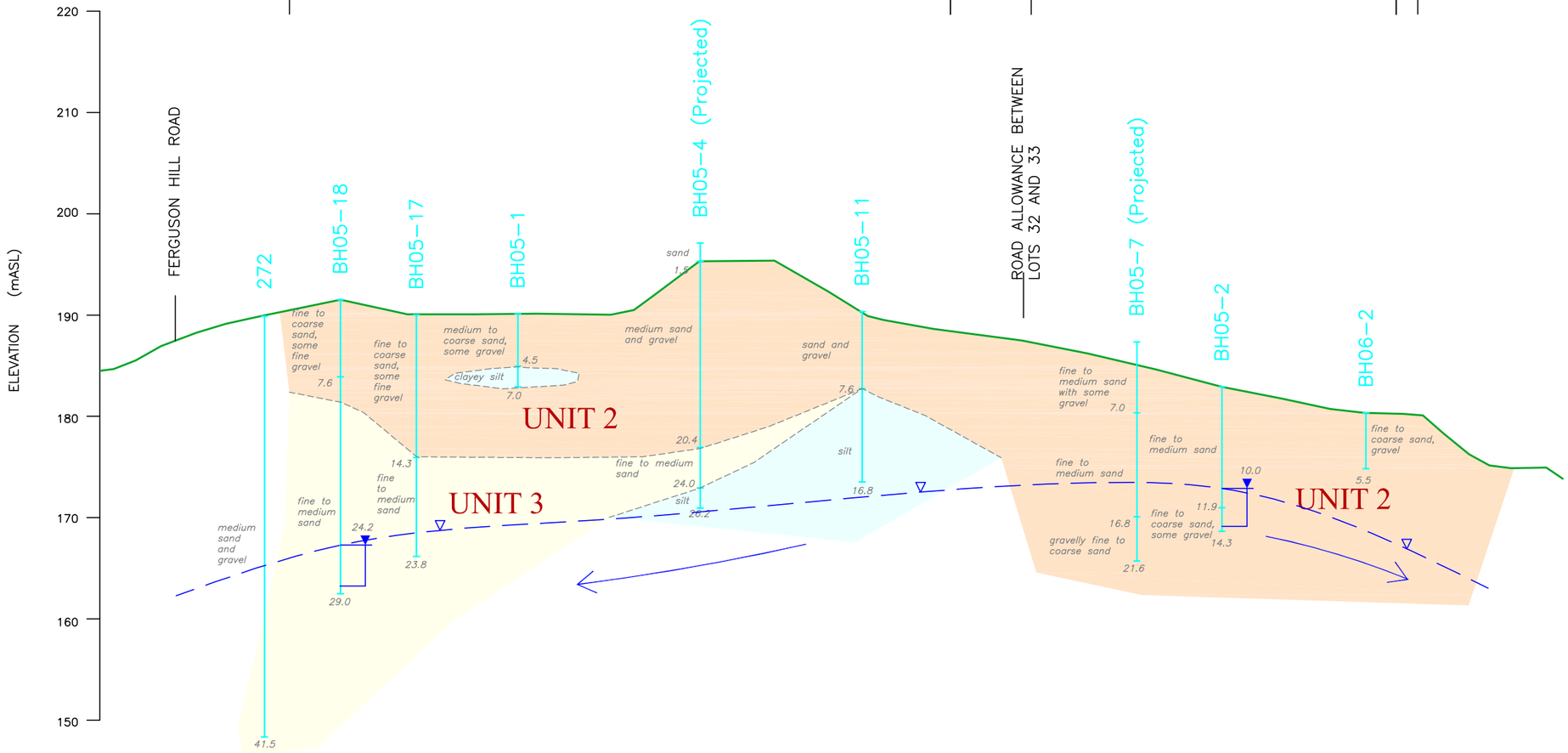
LOOKING NORTH

D'
EAST

CODRINGTON PROPERTY

LIMIT OF EXTRACTION

LIMIT OF EXTRACTION



Legend

BH05-2 — BOREHOLE DESIGNATION

GROUND SURFACE (APPROXIMATE)

CHANGE IN STRATIGRAPHY

INFERRED WATER TABLE MAY, 2008

END OF HOLE

STATIC WATER LEVEL IN JAGGER HIMS LIMITED MONITORING WELL, MAY, 2008

INFERRED DIRECTION OF GROUNDWATER MOVEMENT

UNIT 1: silt, sitly fine sand and till

UNIT 2: sand, gravelly sand and sand and gravel.

UNIT 3: sand, minor gravel

HORIZONTAL SCALE 1:5000
VERTICAL SCALE 1:500

50 0 100 metres

STRATIGRAPHY NOTE:

THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE JAGGER HIMS LIMITED BOREHOLES AND MOE WELL 272 LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SHOWN BETWEEN BORINGS.

CROSS SECTION D-D'

HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALES: AS SHOWN
PROJECT: 051777.00	FILE NO.: 0-05177700F7-CRD

JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 7

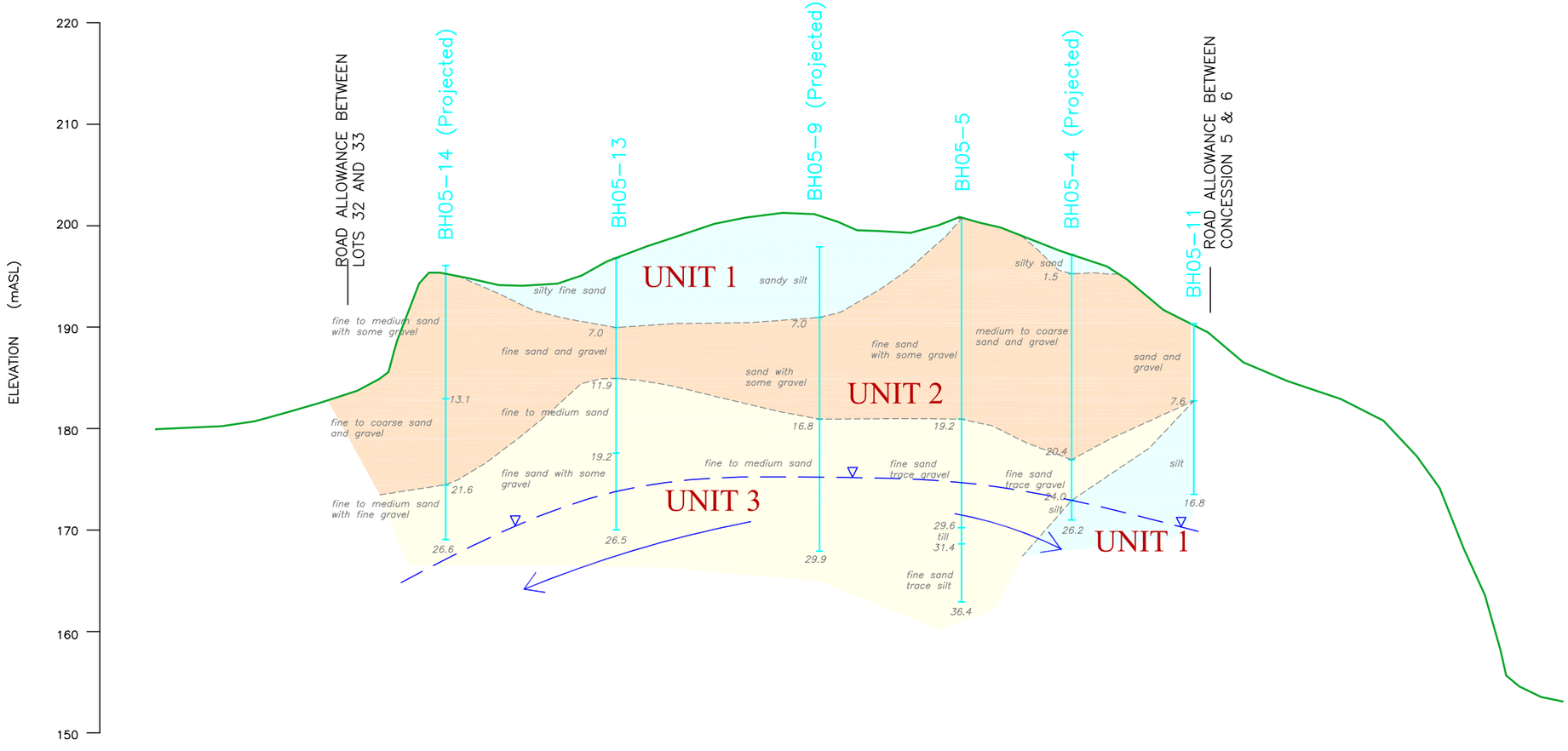
E
NORTH

E'
SOUTH

LOOKING EAST

HILTON PROPERTY

LIMIT OF EXTRACTION



Legend

BH05-2 — BOREHOLE DESIGNATION

GROUND SURFACE (APPROXIMATE)

CHANGE IN STRATIGRAPHY

INFERRED WATER TABLE MAY, 2008

END OF HOLE

STATIC WATER LEVEL IN JAGGER HIMS LIMITED MONITORING WELL, MAY, 2008

INFERRED DIRECTION OF GROUNDWATER MOVEMENT

UNIT 1: silt, sitly fine sand and till

UNIT 2: sand, gravelly sand and sand and gravel.

UNIT 3: sand, minor gravel

HORIZONTAL SCALE 1:5000
VERTICAL SCALE 1:500

50 0 100 metres

STRATIGRAPHY NOTE:

THE ACTUAL SOIL STRATIFICATION HAS BEEN VERIFIED FROM DATA OBTAINED AT THE JAGGER HIMS LIMITED BOREHOLE LOCATIONS ONLY. THE INFERRED CONTACTS SHOWN ARE BASED ON GEOLOGICAL EVIDENCE AND THESE MAY VARY FROM THOSE SHOWN BETWEEN BORINGS.

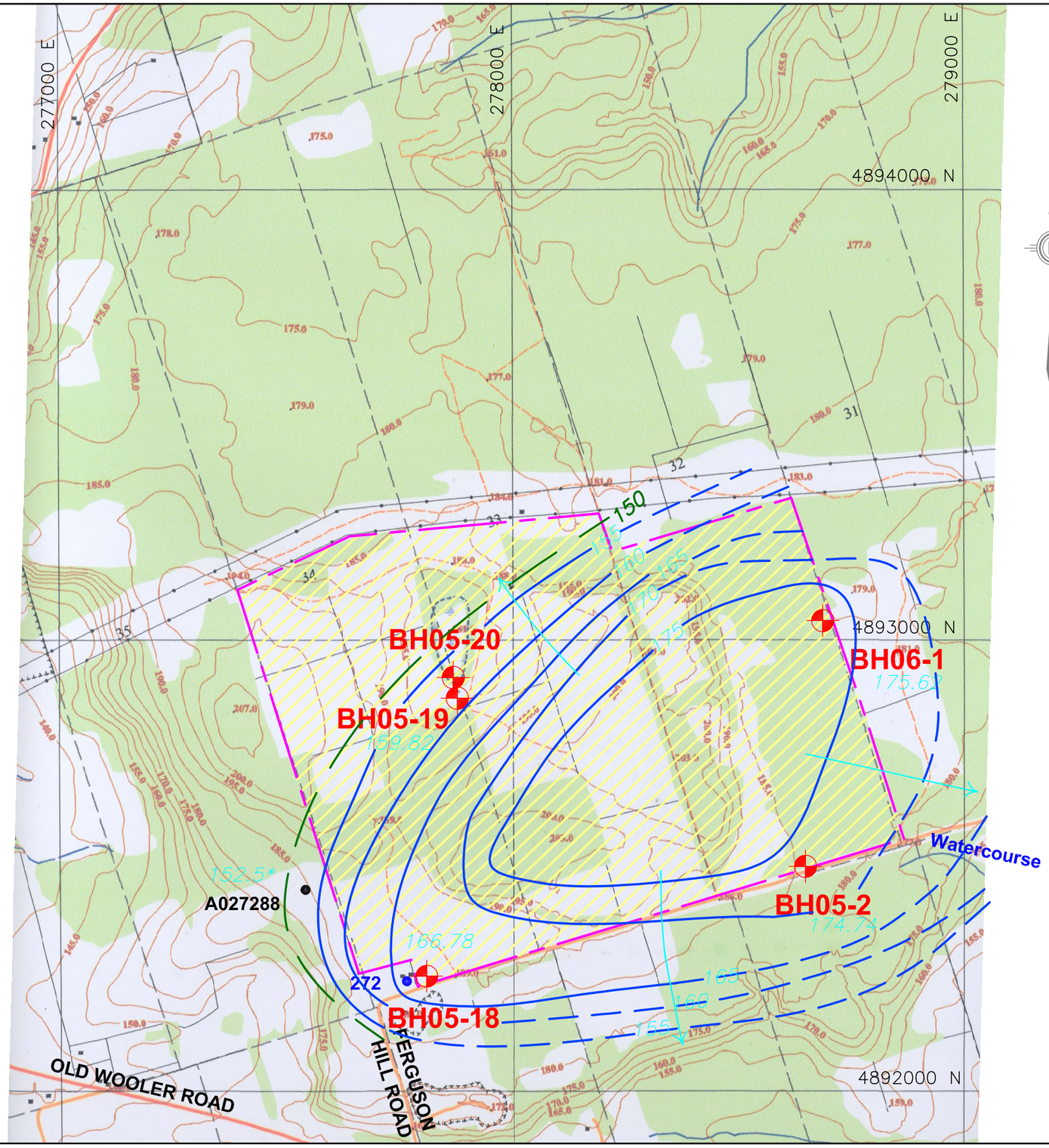
CROSS SECTION E-E'

HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALES: AS SHOWN
PROJECT: 051777.00	FILE NO.: 0-05177700F8-XSE

JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 8



Legend

- PROPERTY BOUNDARY
- BH05-2 174.31 — MONITORING WELL LOCATION, DESIGNATION AND GROUNDWATER LEVEL AS OF MAY 2008
- A027288 152.5* — NEW WATER WELL LOCATION AND DESIGNATION AND APPROXIMATE GROUNDWATER LEVEL AT INSTALLATION
- 272 — MOE WATER WELL LOCATION AND DESIGNATION
- 170 — GROUNDWATER CONTOURS (5 m INTERVALS)
- 150 — EXTRAPOLATED GROUNDWATER CONTOURS
- INFERRED GROUNDWATER FLOW DIRECTION

100 0 200 m

MAP SOURCE:
MAP FROM MNR 10 18 275048900, NAD 83.
AIR PHOTOGRAPHY 1996, PUBLISHED 2002.

WATER TABLE CONFIGURATION - MAY 2008

HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALE: 1:10,000
PROJECT: 051777.00	REF. NO.: 0-05177700F9-GW

JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 9

Legend

- PROPERTY BOUNDARY
- BUFFER ZONE
- INTERNAL LIMIT OF EXTRACTION
- BH06-1 — JAGGER HIMS LIMITED MONITORING WELL LOCATION AND DESIGNATION
- 3G — SUBCATCHMENT BOUNDARY AND DESIGNATION
- ARCHEOLOGICAL SITE

50 0 100 metres

MAP SOURCE
CBM MAP Y321D CBM\A\EXFEPLAN 1 OF 4, MARCH 2006

SUBCATCHMENTS DELINEATION

HYDROGEOLOGICAL STUDY
CODRINGTON PROPERTY
For St. Marys Cement Inc. (Canada)

DATE: MARCH 2009	SCALE: 1:5000
PROJECT: 051777.00	FILE NO.:0-05177700F10-GW

JAGGER HIMS LIMITED
Environmental Consulting Engineers

Figure 10

TABLE 1
SITE WATER BALANCE
HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY
TOWN OF BRIGHTON, NORTHUMBERLAND, ONTARIO

Pre-Development Conditions

SUBCATCHMENT AREA DESIGNATION	FOOTPRINT AREA (m^2)	SURFACE TYPE	INFILTRATION RATE (m/a)	INFILTRATION VOLUME (m^3/a)	RUNOFF RATE (m/a)	RUNOFF VOLUME (m^3/a)	TOTAL
Wetland Catchment Area							
1A							
Woodland	125,384	Trees, bushes	0.287	35,985	0.072	9,028	
Open Area	191,234	Open soil/grass/farmland	0.251	48,000	0.108	20,653	
1B							
Woodland	0	Trees, bushes	0.287	0	0.072	0	
Open Area	10,375	Open soil/grass/farmland	0.251	2,604	0.108	1,121	
1C							
Woodland	6,612	Trees, bushes	0.287	1,898	0.072	476	
Open Area	0	Open soil/grass/farmland	0.251	0	0.108	0	
1D							
Woodland	6,995	Trees, bushes	0.287	2,008	0.072	504	
Open Area	1,697	Open soil/grass/farmland	0.251	426	0.108	183	
1E							
Woodland	1,972	Trees, bushes	0.287	566	0.072	142	
Open Area	6,883	Open soil/grass/farmland	0.251	1,728	0.108	743	
1F							
Woodland	22,893	Trees, bushes	0.287	6,570	0.072	1,648	
Open Area	19,115	Open soil/grass/farmland	0.251	4,798	0.108	2,064	
1G							
Woodland	1,053	Trees, bushes	0.287	302	0.072	76	
Open Area	3,609	Open soil/grass/farmland	0.251	906	0.108	390	
Wetland/pond	7,297	Grass/bushes	0.359	2,620	0	0	
AREA TOTAL	**405,119**			108,410		37,028	
					RUNOFF TOTAL (m^3/a)		**37,028**
					INFILTRATION TOTAL (m^3/a)		**108,410**
					TOTAL WATER ACCUMULATING IN THE POND (m^3/a)		**39,648**
Cold Creek Catchment Area							
2A							
Woodland	85,732	Trees, bushes	0.287	24,605	0.072	6,173	
Open Area	113,564	Open soil/grass/farmland	0.251	28,505	0.108	12,265	
2B							
Woodland	8,089	Trees, bushes	0.287	2,322	0.072	582	
Open Area	37,690	Open soil/grass/farmland	0.251	9,460	0.108	4,071	
AREA TOTAL	**245,075**						
					RUNOFF TOTAL (m^3/a)		**23,091**
					INFILTRATION TOTAL (m^3/a)		**64,891**
Marsh Creek Catchment Area							
3A							
Woodland	1,363	Trees, bushes	0.287	391	0.072	98	
Open Area	5,097	Open soil/grass/farmland	0.251	1,279	0.108	550	
3B							
Woodland	6,880	Trees, bushes	0.287	1,975	0.072	495	
Open Area	9,866	Open soil/grass/farmland	0.251	2,476	0.108	1,066	
3C							
Woodland	9,710	Trees, bushes	0.287	2,787	0.072	699	
Open Area	32,121	Open soil/grass/farmland	0.251	8,062	0.108	3,469	
3D							
Woodland	6,781	Trees, bushes	0.287	1,946	0.072	488	
Open Area	7,786	Open soil/grass/farmland	0.251	1,954	0.108	841	
3E							
Woodland	20,128	Trees, bushes	0.287	5,777	0.072	1,449	
Open Area	5,541	Open soil/grass/farmland	0.251	1,391	0.108	598	
3F							
Woodland	4,545	Trees, bushes	0.287	1,304	0.072	327	
Open Area	3,141	Open soil/grass/farmland	0.251	788	0.108	339	
3G							
Woodland	183,339	Trees, bushes	0.287	52,618	0.072	13,200	
Open Area	67,261	Open soil/grass/farmland	0.251	16,883	0.108	7,264	
3H							
Woodland	38,572	Trees, bushes	0.287	11,070	0.072	2,777	
Open Area	3,192	Open soil/grass/farmland	0.251	801	0.108	345	
AREA TOTAL	**405,323**						
					RUNOFF TOTAL (m^3/a)		**34,007**
					INFILTRATION TOTAL (m^3/a)		**111,504**
SITE FOOTPRINT TOTAL	**1,055,517**						
SITE RUNOFF TOTAL (m^3/a)							**94,126**
SITE INFILTRATION TOTAL (m^3/a)							**284,805**

NOTES:

1) Infiltration rate derived from Table 2 of MOE (1995).
2) Woodland and grass/farmland areas based on 2007 site conditions.
3) "m^3/a" means cubic metres per annum.
4) Totals may vary due to rounding.

TABLE 1
SITE WATER BALANCE
HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY
TOWN OF BRIGHTON, NORTHUMBERLAND, ONTARIO

Post-Development Conditions

SUBCATCHMENT AREA DESIGNATION	FOOTPRINT AREA (m^2)	SURFACE TYPE	INFILTRATION RATE (m/a)	INFILTRATION VOLUME (m^3/a)	RUNOFF RATE (m/a)	RUNOFF VOLUME (m^3/a)	TOTAL
Wetland Catchment Area							
1B							
Woodland	0	Trees, bushes	0.287	0	0.072	0	
Open Area	10,376	Open soil/grass	0.251	2,604	0.108	1,121	
1C							
Woodland	6,612	Trees, bushes	0.287	1,898	0.072	476	
Open Area	0	Open soil/grass	0.251	0	0.108	0	
1D							
Woodland	6,995	Trees, bushes	0.287	2,008	0.072	504	
Open Area	1,697	Open soil/grass	0.251	426	0.108	183	
1F							
Woodland	22,893	Trees, bushes	0.287	6,570	0.072	1,648	
Open Area	19,115	Open soil/grass/farmland	0.251	4,798	0.108	2,064	
1G							
Woodland	1,054	Trees, bushes	0.287	302	0.072	76	
Open Area	3,609	Open soil/grass/farmland	0.251	906	0.108	390	
Wetland/pond	7,297	Grass/bushes	0.359	2,617	0	0	
AREA TOTAL	**79,648**						
						RUNOFF TOTAL (m^3/a)	**6,462**
						INFILTRATION TOTAL (m^3/a)	**22,129**
						TOTAL WATER ACCUMULATING IN THE POND (m^3/a)	**9,079**
Cold Creek Catchment Area							
2B							
Woodland	8,089	Trees, bushes	0.287	2,322	0.072	582	
Open Area	37,690	Open soil/grass/farmland	0.251	9,460	0.108	4,071	
AREA TOTAL	**45,779**						
						RUNOFF TOTAL (m^3/a)	**4,653**
						INFILTRATION TOTAL (m^3/a)	**11,782**
Marsh Creek Catchment Area							
3B							
Woodland	6,880	Trees, bushes	0.287	1,975	0.072	495	
Open Area	9,866	Open soil/grass/farmland	0.251	2,476	0.108	1,066	
3C							
Woodland	9,710	Trees, bushes	0.287	2,787	0.072	699	
Open Area	32,121	Open soil/grass/farmland	0.251	8,062	0.108	3,469	
3D							
Woodland	6,781	Trees, bushes	0.287	1,946	0.072	488	
Open Area	7,786	Open soil/grass/farmland	0.251	1,954	0.108	841	
3F							
Woodland	4,546	Trees, bushes	0.287	1,305	0.072	327	
Open Area	3,140	Open soil/grass/farmland	0.251	788	0.108	339	
3H							
Woodland	38,572	Trees, bushes	0.287	11,070	0.072	2,777	
Open Area	3,192	Open soil/grass/farmland	0.251	801	0.108	345	
AREA TOTAL	**122,594**						
						RUNOFF TOTAL (m^3/a)	**10,847**
						INFILTRATION TOTAL (m^3/a)	**33,165**
Area of extraction							
Open Area*	807,497	Open soil	0.359	289,891	0	0	
						AREA OF EXTRACTION INFILTRATION TOTAL (m^3/a)	**289,891**
SITE FOOTPRINT TOTAL	**1,055,518**						
SITE RUNOFF TOTAL (m^3/a)							**21,961**
SITE INFILTRATION TOTAL (m^3/a)							**356,967**

Volume of Compensation Required

DEVELOPMENT CONDITIONS	INFILTRATION VOLUME (m^3/a)	COMPENSATION AMOUNT (m^3/a)
Pre-Development Conditions	**284,805**	0
Post-Development Conditions	**356,967**	**Surplus 72,162**

NOTES:

1) Infiltration rate derived from Table 2 of MOE (1995).
2) Woodland and grass/farmland areas based on 2007 site conditions.
3) "m^3/a" means cubic metres per annum.
4) Compensation amount=[infiltration under pre-development conditions]-
-[infiltration during post-development conditions].
5) * indicates runoff will be toward excavation and become part of groundwater.
6) Totals may vary due to rounding.

APPENDICES

APPENDIX A

GEOLOGIC DETAILS

- BOREHOLE LOG EXPLANATION FORM
- BOREHOLE LOGS
- MOE WATER WELLS CO-ORDINATES TABLE A-1
- MOE WATER WELL RECORDS TABLE A-2
- NEW WATER WELL A027288 DESCRIPTION TABLE A-3

BOREHOLE LOG EXPLANATION FORM

This explanatory section provides the background to assist in the use of the borehole logs. Each of the headings used on the borehole log, is briefly explained.

DEPTH

This column gives the depth of interpreted geologic contacts in metres below ground surface.

STRATIGRAPHIC DESCRIPTION

This column gives a description of the soil based on a tactile examination of the samples and/or laboratory test results. Each stratum is described according to the following classification and terminology.

Soil Classification *		Terminology	Proportion
Clay	<0.002 mm		
Silt	0.002 to 0.06 mm	"trace" (eg. trace sand)	<10%
Sand	0.06 to 2 mm	"some" (eg. some sand)	10% - 20%
Gravel	2 to 60 mm	adjective (eg. sandy)	20% - 35%
Cobbles	60 to 200 mm	"and" (eg. and sand)	35% - 50%
Boulders	>200 mm	noun (eg. sand)	>50%

* Extension of MIT Classification system unless otherwise noted.

The use of the geologic term "till" implies that both disseminated coarser grained (sand, gravel, cobbles or boulders) particles and finer grained (silt and clay) particles may occur within the described matrix.

The compactness of cohesionless soils and the consistency of cohesive soils are defined by the following:

COHESIONLESS SOIL		COHESIVE SOIL	
Compactness	Standard Penetration Resistance "N", Blows / 0.3 m	Consistency	Standard Penetration Resistance "N", Blows / 0.3 m
Very Loose	0 to 4	Very Soft	0 to 2
Loose	4 to 10	Soft	2 to 4
Compact	10 to 30	Firm	4 to 8
Dense	30 to 50	Stiff	8 to 15
Very Dense	Over 50	Very Stiff	15 to 30
		Hard	Over 30

The moisture conditions of cohesionless and cohesive soils are defined as follows.

COHESIONLESS SOILS	COHESIVE SOILS		
Dry	DTPL	-	Drier Than Plastic Limit
Moist	APL	-	About Plastic Limit
Wet	WTPL	-	Wetter Than Plastic Limit
Saturated	MWTPL	-	Much Wetter Than Plastic Limit

STRATIGRAPHY

Symbols may be used to pictorially identify the interpreted stratigraphy of the soil and rock strata.

MONITOR DETAILS

This column shows the position and designation of standpipe and/or piezometer ground water monitors installed in the borehole. Also the water level may be shown for the date indicated.


Standpipe and Designation


Piezometer and Designation


Gas Monitor and Designation


Borehole Seal (Peltonite, Bentonite or Hole Plug)


Cement Seal


Granular Pack


Granular Backfill


Native Soil Backfill/Cave

Where monitors are placed in separate boreholes, these are shown individually in the "Monitor Details" column. Otherwise, monitors are in the same borehole. For further data regarding seals, screens, etc., the reader is referred to the summary of monitor details table.

SAMPLE

These columns describe the sample type and number, the "N" value, the water content, the percentage recovery, and Rock Quality Designation (RQD), of each sample obtained from the borehole where applicable. The information is recorded at the approximate depth at which the sample was obtained. The legend for sample type is explained below.

SS =	Split Spoon	GS =	Grab Sample
ST =	Thin Walled Shelby Tube	CS =	Channel Sample
AS =	Auger Flight Sample	WS =	Wash Sample
CC =	Continuous Core	RC =	Rock Core

$$\%\ \text{Recovery} = \frac{\text{Length of Core Recovered Per Run}}{\text{Total Length of Run}} \times 100$$

Where rock drilling was carried out, the term RQD (Rock Quality Designation) is used. The RQD is an indirect measure of the number of fractures and soundness of the rock mass. It is obtained from the rock cores by summing the length of core recovered, counting only those pieces of sound core that are 100 mm or more in length. The RQD value is expressed as a percentage and is the ratio of the summed core lengths to the total length of core run. The classification based on the RQD value is given below.

RQD Classification	RQD (%)
Very poor quality	< 25
Poor quality	25 - 50
Fair quality	50 - 75
Good quality	75 - 90
Excellent quality	90 - 100

TEST DATA

The central section of the log provides graphs which are used to plot selected field and laboratory test results at the depth at which they were carried out. The plotting scales are shown at the head of the column.

Dynamic Penetration Resistance - The number of blows required to advance a 51 mm diameter, 60° steel cone fitted to the end of 45 mm OD drill rods, 0.3 m into the subsoil. The cone is driven with a 63.5 kg hammer over a fall of 750 mm.

Standard Penetration Resistance - Standard Penetration Test (SPT) "N" Value - The number of blows required to advance a 51 mm diameter standard split-spoon sampler 300 mm into the subsoil, driven by means of a 63.5 kg hammer falling freely a distance of 750 mm. In cases where the split spoon does not penetrate 300 mm, the number of blows over the distance of actual penetration in millimetres is shown as $\frac{x Blows}{mm}$

Water Content - The ratio of the mass of water to the mass of oven-dry solids in the soil expressed as a percentage.

W_P - Plastic Limit of a fine-grained soil expressed as a percentage as determined from the Atterberg Limit Test.

W_L - Liquid Limit of a fine-grained soil expressed as a percentage as determined from the Atterberg Limit Test.

REMARKS

The last column describes pertinent drilling details, field observations and/or provides an indication of other field or laboratory tests that were performed.

BOREHOLE NO. BH05-1

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 14, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 189 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
0.2	TOPSOIL: BROWN CLAYEY SILT TOPSOIL.										
	SAND: MEDIUM TO COARSE SAND, SOME GRAVEL, MOIST.			GS-1							
2											
				GS-2							
4											
4.6											
	CLAYEY SILT: GREYISH BROWN CLAYEY SILT, APL.			GS-3							
6											
7.0											
	BOREHOLE TERMINATED AT 7.0 m IN CLAYEY SILT.										
8											
10											
12											
14											
16											
18											
20											

Revision 2/ Aug 2003

BOREHOLE NO. BH05-2

PROJECT NAME: CODRINGTON PROPERTY
PROJECT NO.: 051738.00
CLIENT: ST. MARYS CEMENT INC. (CANADA)
DATE: APRIL 22, 2005
BOREHOLE TYPE: BECKER HAMMER DRILL
SUPERVISOR: DBK
GROUND ELEVATION: 184.78 mASL
REVIEWER: AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0	SAND: BROWN FINE TO COARSE SAND, TRACE TO SOME GRAVEL, TRACE SILT,MOIST TO DRY.			GS-1							SURVEY COMPLETED IN 2007
2											
				GS-2							
4											
				GS-3							
6											
8											
				GS-4							
10											
				GS-5							
12	11.9										
	SAND AND GRAVEL: FINE TO COARSE SAND AND FINE GRAVEL, TRACE TO SOME SILT, SATURATED BELOW 11.9 m.			GS-6							
14											
	14.3										
	BOREHOLE TERMINATED AT 14.3 m IN SAND AND GRAVEL.										
16											
18											
20											

Revalon 2/ Aug 2003

UPDATED: July 12, 2005, May 22, 2007

BOREHOLE NO. BH05-3

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 25, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 188 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20											
	SAND: (Continued)			GS9							
22											
				GS10							
24											
				GS11							
26											
				GS12							
28											
	28.7										
	SILT: BROWN SILT, TRACE CLAY, WET TO MOIST.										
30											
				GS13							
32											
	32.3										
	SAND: FINE TO MEDIUM SAND, DRY.			GS14							
34											
	34.7			GS15							
	BOREHOLE TERMINATED AT 34.7 m IN SAND.										
36											
38											
40											

BOREHOLE NO. BH05-4

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 26, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 197 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
1.5	SAND: BROWN SILTY FINE SAND, TRACE GRAVEL, TRACE CLAY, WET.			GS1							
2	SAND AND GRAVEL: MEDIUM TO COARSE SAND AND FINE TO MEDIUM GRAVEL, LAYERED AND VARIABLE, OCCASIONAL COBBLE OR BOULDER, TRACE SILT, DRY.			GS2							
4											
6				GS3							
8											
10				GS4							
12				GS5							
14				GS6							
16				GS7							
18				GS8							
20											

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BOREHOLE NO. BH05-4

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 26, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 197 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)		STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20												
	20.4	SAND AND GRAVEL: (Continued)			GS9							
		SAND: FINE TO MEDIUM SAND, TRACE TO SOME GRAVEL, DRY.										
22												
					GS10							
24	24.0											
		SILT: BROWN SILT, SOME FINE SAND, DRY.										VERY HARD DRILLING
					GS11							
26	26.2											
		BOREHOLE TERMINATED AT 26.2 m IN SILT.										
28												
30												
32												
34												
36												
38												
40												

BOREHOLE NO. BH05-5

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 16, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 200 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
0.2	TOPSOIL: BROWN SILTY SAND TOPSOIL.										
	SAND: FINE TO MEDIUM SAND, TRACE TO SOME GRAVEL, GRAVEL IN LAYERS, TRACE TO SOME SILT, VARIABLE, DRY TO MOIST.			GS1							
2											
				GS2							
4											
				GS3							
6											
8											
				GS4							
10											
				GS5							
12											
				GS6							
14											
				GS7							
16											
18				GS8							
19.2	SAND: FINE TO MEDIUM SAND, SOME SILT, TRACE GRAVEL, MOIST.										
20											

BOREHOLE NO. BH05-5

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 16, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 200 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / Wp WL	REMARKS
20	SAND: (Continued)			GS9							
22				GS10							
24				GS11							
26				GS12							
28											
29.6											
30	TILL: BROWN SANDY SILT TILL, MOIST.			GS13							
31.4											
32	SAND: FINE SAND, TRACE SILT, MOIST TO 33.8 m, SATURATED BELOW 33.8 m.			GS14							
34											
36				GS15							
36.4											
38	BOREHOLE TERMINATED AT 36.4 m IN FINE SAND.										
40											

Revelon 2/ Aug 2003

BOREHOLE NO. BH05-6

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 14-15, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 201 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	SAND: (Continued)			GS9							
22				GS10							
24				GS11							
26				GS12							
28				GS13							BOREHOLE DRY ON COMPLETION POSSIBLE BOULDER OR CEMENTED LAYER
29.6											
30	BOREHOLE TERMINATED AT 29.6 m IN SAND, SOME GRAVEL – REFUSAL.										
32											
34											
36											
38											
40											

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BOREHOLE NO. BH05-6

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 14-15, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 201 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
0.2	TOPSOIL: BROWN SANDY SILT TOPSOIL.										
	SILT: BROWN CLAYEY SILT, SOME FINE SAND.			GS1							
2											
				GS2							
4											
4.6											
	SAND: MEDIUM TO COARSE SAND, SOME GRAVEL TO GRAVELLY, VARIABLE, LOCALLY SILTY, MOIST TO DRY.			GS3							
6											
8				GS4							
10											
				GS5							
12											
				GS6							
14											
				GS7							
16											
				GS8							
18											
20											

Revision 2/ Aug 2003

BOREHOLE NO. BH05-7

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 22, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 187 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	GRAVELLY SAND: (Continued)			GS9							
21.6	BOREHOLE TERMINATED AT 21.6 m IN GRAVELLY SAND.										
22											
24											
26											
28											
30											
32											
34											
36											
38											
40											

Revalon 2/ Aug 2003

BOREHOLE NO. BH05-7

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 22, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 187 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 (W_P W_L)	REMARKS
0	SAND: BROWN FINE TO MEDIUM SAND, SOME SILT, SOME GRAVEL TO GRAVELLY, MOIST.			GS1							
2											
				GS2							
4											
				GS3							
6											
	7.0										
	SAND: BROWN FINE SAND, SOME SILT TO SILTY, MOIST.										
8				GS4							
	9.4										
10	SAND: FINE TO MEDIUM SAND, SOME COARSE SAND, SOME GRAVEL, MOIST.										
				GS5							
12											
				GS6							
14											
	14.3										
	SAND: BROWN FINE TO MEDIUM SAND, TRACE SILT, MOIST.			GS7							
16											
	16.8										
	GRAVELLY SAND: GRAVELLY FINE TO COARSE SAND, TRACE SILT, SATURATED BELOW 17.1 m.			GS8							
18											
20											

Revelon 2/ Aug 2003

BOREHOLE NO. BH05-8

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 18-19, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 194 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
	SAND: SILTY FINE TO MEDIUM SAND, SOME CLAY, MOIST.			GS1							
2											
				GS2							
4											
	4.6										
	GRAVELLY SAND: GRAVELLY SAND TO SAND AND GRAVEL, VARIABLE, OCCASIONAL BOULDER, TRACE TO SOME SILT, DRY TO MOIST.			GS3							
6											
8											
				GS4							
10											
				GS5							
12											
				GS6							
14											
				GS7							
16											
18				GS8							
20											

Revision 2/ Aug 2003

BOREHOLE NO. BH05-8

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 18-19, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 194 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	GRAVELLY SAND: (Continued)			GS9							
21.6											
22	SAND: FINE TO MEDIUM SAND, SOME FINE GRAVEL, DRY.			GS10							
24											BOREHOLE DRY ON COMPLETION.
				GS11							REFUSAL DUE TO BOULDER OR POSSIBLE CEMENTED LAYER.
26											
26.5	BOREHOLE TERMINATED AT 26.5 m IN SAND.										
28											
30											
32											
34											
36											
38											
40											

BOREHOLE NO. BH05-9

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 16-18, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 201 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / Wp WL	REMARKS
20	SAND: (Continued)			GS9							
22				GS10							
24				GS11							BOREHOLE DRY ON COMPLETION. REFUSAL DUE TO BOULDER OR POSSIBLE CEMENTED LAYER.
26				GS12							
28											
30	29.9										
32	BOREHOLE TERMINATED AT 29.9 m IN FINE TO MEDIUM SAND AND SILT.										
34											
36											
38											
40											

BOREHOLE NO. BH05-9

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 16-18, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 201 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
	SAND: BROWN FINE SAND, SOME SILT, TRACE GRAVEL, MOIST.			GS1							
2											
				GS2							
4											
				GS3							
6											
8	7.0										
	SAND: FINE TO COARSE SAND, TRACE TO SOME FINE GRAVEL, TRACE SILT, MOIST.			GS4							
10											
				GS5							
12											
				GS6							
14											
				GS7							
16											
	16.8										
	SAND AND SILT: BROWN FINE TO MEDIUM SAND AND SILT, MOIST.			GS8							
18											
20											

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BOREHOLE NO. BH05-10

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 21, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 198 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	SAND: (Continued)			GS9							
22				GS10							
24				GS11							
26				GS12							
28											REFUSAL DUE TO HARD DRILLING AND PLUGGED RODS.
28.7	BOREHOLE TERMINATED AT 28.7 m IN SAND.										
30											
32											
34											
36											
38											
40											

Revision 2/ Aug 2003

BOREHOLE NO. BH05-10

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 21, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 198 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	'N' VALUE	% WATER	% RECOVERY	RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
	SAND: BROWN FINE TO MEDIUM SAND, TRACE TO SOME SILT, UNIFORM, DRY TO MOIST.			GS1							
2											
				GS2							
4											
				GS3							
6											
	7.0										
	SAND: FINE TO COARSE SAND, TRACE TO SOME FINE GRAVEL, MOIST.										
8											
				GS4							
10											
	10.4										
	SILT: FINE SANDY SILT, WET.			GS5							
	11.4										
	SAND: FINE TO COARSE SAND, TRACE SILT, TRACE GRAVEL, MOIST TO WET.										
12											
				GS6							
14	14.0										
	14.3 SILT:										
	SAND: GRAVELLY MEDIUM TO COARSE SAND, TRACE SILT, OCCASIONAL COBBLE OR BOULDER, DRY TO MOIST.			GS7							
16											
18				GS8							
20											

BOREHOLE NO. BH05-11

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 28, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 197 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0	SAND AND GRAVEL: BROWN FINE TO COARSE SAND AND FINE TO COARSE GRAVEL, TRACE SILT, OCCASIONAL BOULDER, DRY.			GS1							NOTE: BOREHOLE ORIGINALLY RECORDED AS BOREHOLE 18 IN FIELDBOOK.
2											
				GS2							
4											
				GS3							
6											
	7.6										
8	SILT: BROWN SILT, SOME FINE SAND, INCREASING FINE SAND WITH DEPTH, DRY TO MOIST TO 16.8 m, SATURATED BELOW 16.8 m.			GS4							
10											
				GS5							
12											
				GS6							
14											
				GS7							
16											
				GS8							
18											
	19.2										BOREHOLE TERMINATED DUE TO HEAVING FINE SANDS.
20	BOREHOLE TERMINATED AT 19.2 m IN SILTY FINE SAND.										

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BOREHOLE NO. BH05-11

PROJECT NAME: CODRINGTON PROPERTY

PROJECT NO.: 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA)

DATE: APRIL 28, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL

SUPERVISOR: DBK

GROUND ELEVATION: 197 m ASL (estimated)

REVIEWER: AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20											
22											
24											
26											
28											
30											
32											
34											
36											
38											
40											

BOREHOLE NO. BH05-12

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 18, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 193 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	SAND: (Continued)			GS9							
22				GS10							
24				GS11							
26				GS12							
28	– TRACE COARSE SAND AND FINE GRAVEL BELOW ± 28 m. – SATURATED BELOW ± 29 m.										
30				GS13							
32				GS14							
34				GS15							
36											
	36.3										
	BOREHOLE TERMINATED AT 36.3 m IN FINE TO MEDIUM SAND.										
38											
40											

BOREHOLE NO. BH05-12

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 18, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 193 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0	SILT AND SAND: BROWN SANDY SILT TO SILTY SAND, TRACE CLAY, TRACE GRAVEL, MOIST TO WET.			GS1							
2											
				GS2							
4											
				GS3							
6											
7.0											
8	SAND: BROWN FINE TO MEDIUM SAND, TRACE TO SOME SILT, DRY TO 26 m, MOIST 26 m TO 29 m, SATURATED BELOW 29 m, OCCASIONAL COBBLE OR BOULDER.			GS4							
10											
				GS5							
12											
				GS6							
14											
				GS7							
16											
18				GS8							
20											

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BOREHOLE NO. BH05-13

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 20, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 197 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	SAND: (Continued)			GS9							
22				GS10							
24				GS11							BOREHOLE DRY ON COMPLETION.
26											REFUSAL DUE TO BOULDER OR CEMENTED LAYER.
26.5	BOREHOLE TERMINATED AT 26.5 m IN SAND.										
28											
30											
32											
34											
36											
38											
40											

Revision 2/ Aug 2003

BOREHOLE NO. BH05-13

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 20, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 197 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
	SAND: BROWN FINE TO MEDIUM SAND, TRACE SILT, TRACE GRAVEL, MOIST.			GS1							
2											
				GS2							
4											
				GS3							
6											
7.0											
	SAND: BROWN FINE TO COARSE SAND, SOME GRAVEL TO GRAVELLY, MOIST.										
8				GS4							
10											
				GS5							
12											
11.9											
	SAND: SILTY BROWN FINE TO MEDIUM SAND, UNIFORM, MOIST.			GS6							
14											
				GS7							
16											
				GS8							
18											
19.2											
	SAND: MEDIUM SAND WITH SOME FINE GRAVEL, MOIST.										
20											

BOREHOLE NO. BH05-14

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 27, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 196 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0	SAND: BROWN FINE TO MEDIUM SAND WITH SOME TO TRACE FINE GRAVEL, TRACE TO SOME SILT, DRY TO MOIST.			GS1							
2											
4				GS2							
6				GS3							
8											
10				GS4							
12				GS5							
13.1											
14	SAND AND GRAVEL: BROWN FINE TO COARSE SAND SOME FINE TO MEDIUM GRAVEL, TRACE TO SOME SILT, DRY.			GS6							
16				GS7							
18				GS8							
20											

BOREHOLE NO. BH05-14

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 27, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 196 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	SAND AND GRAVEL: (Continued)			GS9							
21.6											
22	SAND: FINE TO MEDIUM SAND, OCCASIONAL COBBLE OR BOULDER, TRACE TO SOME FINE GRAVEL, DRY.			GS10							
24											
				GS11							
26											BOREHOLE DRY ON COMPLETION. REFUSAL
26.6	BOREHOLE TERMINATED AT 26.6 m IN SAND.										
28											
30											
32											
34											
36											
38											
40											

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BOREHOLE NO. BH05-15

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 27, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 197 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0	TILL: GREYISH BROWN CLAYEY SILT TILL, APL – DTPL.			GS1							
2											
4				GS2							
6				GS3							
8											
10				GS4							
12				GS5							DIFFICULT DRILLING.
	11.9										
14	BOREHOLE TERMINATED AT 11.9 m IN SILT TILL.										
16											
18											
20											

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BOREHOLE NO. BH05-16

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 19-20, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 185 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0											
	SAND: FINE TO MEDIUM SAND, SOME SILT, TRACE CLAY, MOIST.			GS1							
2											
				GS2							
4											
	4.6										
	SILT: BROWN SANDY SILT, SOME CLAY, OCCASIONAL COBBLE, MOIST.			GS3							
6											
8											
				GS4							
10											
				GS5							
	11.3										
	TILL: GREYISH BROWN SANDY SILT TILL, TRACE TO SOME CLAY, MOIST.										
12											
				GS6							
14											
				GS7							
16											
	16.8										
	SAND AND GRAVEL: BROWN FINE TO MEDIUM SAND, UNIFORM, MOIST.										
18				GS8							
20											

Revision 2/ Aug 2003

BOREHOLE NO. BH05-16

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 19-20, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 185 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	SAND: (Continued)			GS9							
22				GS10							
24											REFUSAL – BOULDER OR POSSIBLE CEMENTED LAYER.
24.2	BOREHOLE TERMINATED AT 24.2 m IN SAND.										
26											
28											
30											
32											
34											
36											
38											
40											

BOREHOLE NO. BH05-17

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 27, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 189 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0	SAND: BROWN FINE TO COARSE SAND, SOME FINE GRAVEL, DRY.			GS1							
2				GS2							
4				GS3							
6											
8				GS4							
10				GS5							
12				GS6							
14											
14.3	SAND: BROWN FINE TO MEDIUM SAND, UNIFORM, DRY.			GS7							
16											
18				GS8							
20											

Revision 2/ Aug 2003

BOREHOLE NO. BH05-17

PROJECT NAME: CODRINGTON PROPERTY **PROJECT NO.:** 051738.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** APRIL 27, 2005

BOREHOLE TYPE: BECKER HAMMER DRILL **SUPERVISOR:** DBK

GROUND ELEVATION: 189 m ASL (estimated) **REVIEWER:** AJC

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
20	SAND: (Continued)			GS9							
22				GS10							
23.8	BOREHOLE TERMINATED AT 23.8 m IN SAND.										REFUSAL DUE TO CEMENTED LAYER.
24											
26											
28											
30											
32											
34											
36											
38											
40											

BOREHOLE NO. BH05-18

PROJECT NAME: LEVEL I HYDROGEOLOGIC STUDY,CODRINGTON PROPERTY **PROJECT NO.:** 0-051777.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** OCTOBER 12, 2005

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER **SUPERVISOR:** TAS

GROUND ELEVATION: 190.96 mASL **REVIEWER:** VGM

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	REMARKS
0									10 20 30	10 20 30	
2	SAND: BROWN, FINE TO COARSE SAND, SOME FINE GRAVEL, MOIST, VERY DENSE TO DENSE.			SS1	6	10	25				
				SS2	61	2	60		61		
4				SS3	>50	2	20		>50		
6				SS4	52	2	65		52		
				SS5	35	2	40				
8	7.6			SS6	>50	4	35		>50		
	SAND: BROWN FINE TO MEDIUM SAND, TRACE FINE TO COARSE GRAVEL, MOIST, VERY DENSE.			SS7	>50	5	20		>50		
10				SS8	75	–	40		75		
12				SS9	100	3	70		100		
14				SS10	125	4	10		125		
16				SS11	>120	–	40		>120		
18				SS12	>50	6	30		>50		
20				SS13	>100	–	20		>100		

BOREHOLE NO. BH05-18

PROJECT NAME: LEVEL I HYDROGEOLOGIC STUDY,CODRINGTON PROPERTY PROJECT NO.: 0-051777.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) DATE: OCTOBER 12, 2005

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER SUPERVISOR: TAS

GROUND ELEVATION: 190.96 mASL REVIEWER: VGM

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / Wp WL	REMARKS
20											
	SAND: Continued.										
22				SS14	125	8	20		125		
24											
26	25.9										
	SAND: GREY FINE TO COARSE SAND, TRACE SILT, SATURATED, VERY DENSE.			SS15	185	12	100		185		
28											
	29.0			SS16	>100	–	10		>100		
	BOREHOLE TERMINATED AT 29.0 m IN FINE TO COARSE SAND.										
30											
32											
34											
36											
38											
40											

BOREHOLE NO. BH05-19

PROJECT NAME: LEVEL I HYDROGEOLOGIC STUDY, CODRINGTON PROPERTY **PROJECT NO.:** 0-051777.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** OCTOBER 12, 2005

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER **SUPERVISOR:** TAS

GROUND ELEVATION: 184.98 mASL **REVIEWER:** VGM

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	REMARKS
20									10 20 30	10 20 30	
	SAND: Continued.			SS10	121	–	30		121		
22				SS11	112	3	35		112		
				SS12	160	–	40		160		
24				SS13	>100	2	30		>100		
26	– SATURATED BELOW 26 m.			SS14	100	2	70		100		
28											
29.6				SS15	33	17	100				
30	BOREHOLE TERMINATED AT 29.6 m IN FINE TO MEDIUM SAND.										
32											
34											
36											
38											
40											

BOREHOLE NO. BH05-19

PROJECT NAME: LEVEL I HYDROGEOLOGIC STUDY, CODRINGTON PROPERTY **PROJECT NO.:** 0-051777.00

CLIENT: ST. MARYS CEMENT INC. (CANADA) **DATE:** OCTOBER 12, 2005

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER **SUPERVISOR:** TAS

GROUND ELEVATION: 184.98 mASL **REVIEWER:** VGM

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	'N' VALUE	% WATER	% RECOVERY	RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	REMARKS
0									10 20 30	10 20 30	
0.6	TOPSOIL: BROWN, FINE TO MEDIUM SAND, TRACE SILT, TRACE FINE GRAVEL, TRACE ROOTLETS, WET, LOOSE.			SS	6	–	5				
2	SILT: GREY, CLAYEY SILT, WTPL, STIFF TO 4 m, VERY SOFT TO FIRM BELOW 4 m TO 8.2 m.										
				SS1	12	13	100				
4											
				SS2	0	26	90				
6											
				SS3	5	30	80				
8											
8.2				SS4	1	24	100				
	SAND: BROWN FINE TO MEDIUM SAND, VERY DENSE, MOIST TO 26 m, SATURATED BELOW 26 m.			SS5	>100	28	30		>100		
10											
12				SS6	>120	7	40		>120		
14				SS7	>100	6	30		>100		
16											
				SS8	120	–	25		120		
18											
				SS9	>100	4	40		>100		
20											

BOREHOLE NO. BH05-20

PROJECT NAME: LEVEL I HYDROGEOLOGIC STUDY, CODRINGTON PROPERTY
PROJECT NO.: 0-051777.00

CLIENT: ST. MARYS CEMENT INC. (CANADA)
DATE: OCTOBER 12, 2005

BOREHOLE TYPE: 108 mm I.D. HOLLOW STEM AUGER
SUPERVISOR: TAS

GROUND ELEVATION: 182.81 mASL
REVIEWER: VGM

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE 'N' VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE 10 20 30 / SHEAR STRENGTH	WATER CONTENT % 10 20 30 / W_P W_L	REMARKS
0	SILT AND CLAY: BROWN CLAYEY SILT TO SILTY CLAY, APL, FIRM, BELOW 3 m VERY SOFT TO SOFT, WTPL.			SS1	8	16	60				
2				SS2	6	–	60				
				SS3	8	23	90				
4				SS4	1	–	3				
				SS5	4	26	100				
				SS6	1	–	100				
5.1				SS7	2	26	100				
6	BOREHOLE TERMINATED AT 5.1 m IN SILT AND CLAY.										
8											
10											
12											
14											
16											
18											
20											

BOREHOLE NO. BH06-1

PROJECT NAME: CODRINGTON PROPERTY HYDROGEOLOGICAL STUDY
PROJECT NO.: 0-051777.00
CLIENT: ST. MARYS CEMENT INC. (CANADA)
DATE COMPLETED: Mar 30, 2006
BOREHOLE TYPE: 200 mm DIA. HOLLOW STEM AUGER
SUPERVISOR: DBK
GROUND ELEVATION: 182.6 mASL
REVIEWER: JTB

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE ROD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH	WATER CONTENT % (W_P – W_L)	REMARKS
0.0	TOPSOIL: BLACK TOPSOIL, FINE TO MEDIUM SAND.			SS1	50		58		50		0.3 m SAMPLE INTERVAL
	SAND AND GRAVEL: BROWN FINE TO COARSE SAND AND GRAVEL, SOME COBBLES, TRACE FINE SAND AT DEPTH, LOOSE TO VERY DENSE AT 1.4 m, MOIST TO SATURATED AT 8.4 m.										
1.0				SS2	6		25				
				SS3	132		33		132		0.46 m SAMPLE INTERVAL
2.0				SS4	91		60		91		0.51 m SAMPLE INTERVAL
3.0				SS5	123		58		123		0.3 m SAMPLE INTERVAL
4.0				SS6	120		50		120		0.3 m SAMPLE INTERVAL
				SS7	154		67		154		0.3 m SAMPLE INTERVAL
5.0				SS8			100				0.08 m SAMPLE INTERVAL SPLIT SPOON REFUSAL TO ADVANCE
6.0				SS9			100				SPLIT SPOON REFUSAL TO ADVANCE 0.15 m SAMPLE INTERVAL SPLIT SPOON REFUSAL TO ADVAND
				SS10	172		0		172		
7.0				SS11			33				SPLIT SPOON REFUSAL TO ADVANCE 0.3 m SAMPLE INTERVAL
8.0				SS12	80		100		80		
9.0				SS13	43		100		43		
10.0				SS14	134		133		134		SOILS HEAVING INTO AUGERS
10.7	BOREHOLE TERMINATED AT 10.7 m IN SAND AND GRAVEL.										
11.0											

JHL GEOLOGIC B/W (METRIC) WITH UTM 05177700 HINTON PROPERTY.GPJ JAGGER HIMS BASIC.GDT 8/18/08

UTM CO-ORDINATES
UTM Zone: 18 NAD: 83
Easting: 278686
Northing: 4893050

BOREHOLE NO. BH06-2

PROJECT NAME: CODRINGTON PROPERTY HYDROGEOLOGICAL STUDY
PROJECT NO.: 0-051777.00

CLIENT: ST. MARYS CEMENT INC. (CANADA)
DATE COMPLETED: Mar 30, 2006

BOREHOLE TYPE: 200 mm DIA. HOLLOW STEM AUGER
SUPERVISOR: DBK

GROUND ELEVATION: 182.6 mASL
REVIEWER: JTB

UTM CO-ORDINATES
UTM Zone: 18 NAD: 83
Easting: 276794
Northing: 4892548

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	STRATIGRAPHY	MONITOR DETAILS	SAMPLE TYPE	SAMPLE N VALUE	SAMPLE % WATER	SAMPLE % RECOVERY	SAMPLE RQD (%)	CONE PENETRATION "N" VALUE / SHEAR STRENGTH (10 20 30)	WATER CONTENT % (10 20 30; W_P W_L)	REMARKS
0.0											
0.3	TOPSOIL: BLACK TOPSOIL, FINE TO MEDIUM SAND.										
	SAND AND GRAVEL: BROWN FINE TO COARSE SAND AND GRAVEL, SOME COBBLES, FINE SAND SEAM FROM 3.5 m TO 3.9 m, LOOSE TO VERY DENSE AT 0.7 m, MOIST TO WET AT 3.4 m.			SS1	7		75				BOULDER REFUSAL IN 1ST HOLE
1.0				SS2	30		75				
				SS3	130		86				0.36 m SAMPLE INTERVAL
2.0				SS4	133		87				0.38 m SAMPLE INTERVAL
3.0				SS5	47		75				
4.0				SS6	134		100				0.46 m SAMPLE INTERVAL
5.0				SS7	114		94				0.46 m SAMPLE INTERVAL
5.5	BOREHOLE TERMINATED AT 5.5 m IN SAND AND GRAVEL.			SS8			100				0.15 m SAMPLE INTERVAL SPLIT SPOON REFUSAL TO ADVANCE
6.0											
7.0											
8.0											
9.0											
10.0											
11.0											

JHL GEOLOGIC B/W (METRIC) WITH UTM 05177700 HINTON PROPERTY.GPJ JAGGER HIMS BASIC.GDT 8/18/08

TABLE A-1
MOE WATER WELL COORDINATES
HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY
TOWN OF BRIGHTON, NORTHUMBERLAND, ONTARIO

BOREHOLE I.D.	CONSESSION #	LOT #	UTM EASTING NORTHING
271	5	24	282147 4892832
4444	5	25	281620 4893120
5361	5	27	280720 4892820
4764	5	27	281580 4892800
5242	5	28	280340 4891880
4564	5	28	280700 4890840
4580	5	29	280480 4891180
3352	5	33	278700 4890170
5043	5	34	278120 4891640
4117	5	34	278150 4891470
5051	5	34	278100 4891580
3099	5	34	278600 4890175
3291	6	29	279900 4892700
272	6	34	277668 4892041
274	7	2	277091 4889741
273	7	2	277140 4889979
4675	7	2	277140 4890340
3358	7	2	277150 4890200
3627	7	31	278037 4895671
5070	7	31	278100 4896100
4302	7	33	277420 4895570
5330	7	36	276200 4895480
3194	8	2	276140 4893250
278	8	2	276611 4891588
279	8	2	276646 4891501
3149	8	3	275975 4893375
3094	8	3	276025 4893200
280	8	3	276142 4891469
3841	9	2	275850 4895300
4243	9	3	275820 4893820
286	9	3	275850 4893925
3148	9	3	275850 4893925

TABLE A-2

MOE WATER WELL RECORDS

	CON	5	6	5491	276780 4885320	725 07/80	2104	6	FR	0153 0155	25	150	3 07:30 DO	
	CON	5	9	270	275755 4894981	785 01/53	4829	6	FR	0070				
	CON	5	24	271	282147 4892832	450 10/62	3010	6	FR	0060	30	40	10 02:00 DO	
	CON	5	25	4444	281620 4893120	442 08/76	2334	6	FR	0065	6	46	5 02:00 DO	
	CON	5	27	5361	280720 4892820	420 12/75	4409	6	FR	0052	6	39	10 01:45 IN DO	
	CON	5	27	4764	281580 4892800	428 08/77	1891	6	FR	0090	34	70	10 03:00 ST	
	CON	5	28	5242	280340 4891980	460 06/79	2553	6	FR	0088	40	80	6 03:00 ST DO	
	CON	5	28	4564	280700 4890840	550 11/76	1805	6	FR	0188	10	110	3 04:00 DO	
	CON	5	29	4580	280480 4891180	448 12/76	1805	6	FR	0070	10	85	4 04:00 DO	
	CON	5	33	3552	278700 4890170	430 09/72	5016	6	FR FR	0120 0126	FLW	26	20 03:30 DO	
	CON	5	34	5043	278120 4891640	515 07/78	2104	6	SU	0200				
	CON	5	34	4117	276150	550 07/75	2553	6	FR	0070	65	80	5 04:30 DO	

BRWN STNS 0021 GRVL SAND 0028
MUTTON B
BRWN CLAY BLDR MGRD 0020 GREY CLAY STNS MGRD 0153 GREY GRVL STNS SHLE 0155
MULTON A FLOYD
PRDG 0024 BRWN CLAY STNS 0069 QSND 0070
BELL J
BRWN CLAY 0014 BLUE CLAY 0050 BRWN 0063
VANTOMME N
GREY CLAY ONSE 0045 GREY SAND ONSE 0059 GREY GRVL SAND ONSE 0065
SHEWMAN L
BRWN SAND 0012 GREY CLAY 0018 BRWN SAND 0050 BRWN GRVL 0052 UNKN 0054
DORLAND JOHN
SAND 0004 CLAY 0044 SAND BLDR 0049 CLAY 0090 SAND 0090
NELSON FARMS
BRWN LOAM 0002 BRWN CLAY 0023 GREY CLAY 0050 GREY QSND 0075 BRWN CSND 0080
SCHUMAN R
CLAY 0019 GREY BRAN STNS 0081 BLUE CLAY 0182 MGVL 0189 CGVL 0190
BRUSJIAM JIM
CLAY 0012 GRVL CLAY 0018 CGVL SAND 0036 BLUE CLAY 0070 GRVL SAND 0095
TIALIN J S
GREY CLAY 0100 GREY SAND 0115 GREY SAND GRVL 0120 GREY GRVL 0126
BUTCHER ROBERT
BRWN SAND LOAM SOFT 0001 BRWN FSND SOFT 0010 BRWN GRVL SAND LOOS 0090 GREY CLAY STNS PCKD 0130 GREY GRVL CLYY PCKD 0146 GREY LMSN ROCK HARD 0205
MILLS WILLIAM

MUNICIPALITY CONCESSION ETC CONTINUING ... BRIGHTON	LOT	WELL NO	UTM EASTING NORTHING TOWNSHIP	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR:MN	WATER USE	SCREEN DEPTH FEET	SCREEN LENGTH FEET	OWNER DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
			4891470														BRWN SAND LOAM 0020 BRWN FSND 0030 GREY CGVL 0060 BRWN GRVL SAND 0070 GREY CLAY HARD 0086
CON	5	34 5051	278160 4891580	515	08/78	2104	6	FR	0155	92	92	12	10:00	DO			BUTCHER ROBERT BRWN SAND LOAM SOFT 0004 BRWN MSND CLAY 0069 BRWN FGVL CLAY ONSE 0080 GREY CLAY STKY 0149 GREY SHLE LMSN HARD 0155 GREY SHLE STNS HARD 0159
CON	5	34 3099	278600 4890175	425	10/71	2334	6	FR	0050	5	30	10	03:00	DO			PARSONS M BLCK LOAM 0002 BRWN CLAY 0007 GREY CLAY 0055 GREY SILT SAND 0095 GREY GRVL SAND 0099
CON	6	3 4250	277550 4888450	515	10/75	2553	6	FR	0133	45	70	20	04:00	DO			OTONAS KYMANTAS BRWN FSND 0125 BRWN GRVL FSND 0133
CON	6	29 3291	279900 4892700	420	08/72	1805	36	FR	0018	12	18	5	04:00	DO			DIGGETS P CLAY GRVL 0018
CON	6	34 272	277668 4892041	610	08/61	4829	5	FR	0136	22	22	20	01:30	DO			SULEY VICTOR GRVL MSND 0136
CON	7	2 274	277091 4889741	425	10/66	1806	6	FR	0052	3	62	2	02:00	DO			GROOT JOHN FSND 0020 HPAN 0045 BLUE CLAY 0055 GPVL 0062
CON	7	2 273	277140 4889979	430	02/66	4901	6	FR	0077	20	25	20	04:00	DO			HAZLEWOOD BRYCE CLAY MSND 0018 GRVL 0028 GREY CLAY 0054 QSND 0070 GRVL MSND 0075 GRVL 0077
CON	7	2 4675	277140 4890240	425	04/77	4409	6	FR	0065	4	60	20	02:15	CO			ORLAND FARM & FEED BRWN CLAY 0016 GREY CLAY 0042 GREY HPAN 0050 GREY GRVL FGRD 0052 GREY CLAY GRVL 0064 GREY LMSN 0069
CON	7	2 3858	277150 4890200	425	09/72	5016	6	FR FR	0064 0067	10	47	10	04:30	DO			CARTER J PROG 0014 GREY CLAY 0060 GREY SAND 0064 GREY GRVL 0067
CON	7	3 4996	276767 4891340	475	07/78	5016	6	FR	0055	14	50	4	03:00	DO			MCLAUGHLIN JOHN PROG 0017 GREY CLAY 0055 GREY GRVL 0057
CON	7	3 276	276851 4889429	450	09/66	4811	7	FR	0057	8	60	4	00:30	DO			PLUG A LOAM 0004 BLUE CLAY 0057 GRVL 0060
CON	7	3 2991	277050 4890125	425	03/71	4901	6	FR	0086	23	23	20	04:00	DO			DINGMAN B BRWN SAND 0010 GREY CLAY 0040 BLUE CLAY 0085 GREY LMSN 0093

MUNICIPALITY CONCESSION ETC CONTINUING	LOT	WELL NO	UTM EASTING NORTHING TOWNSHIP	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR:MN	WATER USE	SCREEN DEPTH FEET	SCREEN LENGTH FEET	OWNER DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
CON	7	3 4854	277160 4889900	445	06/77	3129	30	FR	0011	5	19	9	01:00	DO			WILLIAM BIGFORD LOAM 0001 CSND 0011 FSND WBRG 0021
CON	7	3 5329	277160 4890020	450	10/79	1352	6	FR	0079	20	75	6	01:00	DO			SULLIVAN W BRWN SAND 0015 GREY CLAY 0070 GREY GRVL 0079
CON	7	3 4953	277180 4889640	450	06/77	3129	30	FR	0012	6	18	9	01:00	DO			WILLIAM BIGFORD LOAM 0001 CSND 0012 FSND WBRG 0026
CON	7	3 275	277356 4889644	445	07/66	4901	6	FR	0082	24	76	6	01:30	ST DO			PEISTER ARNOLD CLAY 0022 MSND GRVL 0045 CLAY GRVL 0065 GRVL 0082
CON	7	4 277	276046 4891221	500	04/59	3010	6	FR	0077	9	9	5	02:00	DO			WRIGHT E MSND GRVL 0070 HPAN 0073 GRVL 0077
CON	7	5 5439	276720 4891160	500	01/80	4409	6	FR	0062	29	29	20	02:15	ST DO			MASTROMARCO M BRWN LOAM SNDY 0003 BRWN SAND 0028 BRWN CGVL CSND 0054 GREY GRVL 0063
CON	7	31 3627	278037 4895671	420	09/75	5016	6	FR	0050	17	50	3	04:00	DO			ALLAN JOHN BRWN SAND BLDR 0042 GREY LMSN 0056
CON	7	31 5070	278100 4896100	455	08/78	2553	6	FR	0072	25	70	6	02:30	DO			TAMM V BRWN LOAM 0001 GREY BLDR HPAN PCKD 0071 BRWN CGVL 0072
CON	7	33 4302	277420 4895570	405	05/75	3129	30	FR	0017	12	24	6	01:00	DO			SHEPPARD ROSS LOAM 0001 HPAN STNS 0018 GREY CLAY 0023 BLDR 0025
CON	7	36 5330	276200 4895480	475	10/79	1831	6	FR	0100	32	92	5	01:00	DO			MCCARTNY K CLAY GRVL 0092 SAND 0098 LMSN 0100
CON	8	2 3194	276140 4893250	400	05/72	5016	6	FR FR	0048 0052		27	4	03:30	DO			RANKIN F BRWN SAND CLAY 0010 GREY CLAY 0048 GREY GRVL 0052
CON	8	2 276	276611 4891588	485	02/55	1343	5	FR	0040	8	12	3	00:30	DO			HAZLEWOOD BRYCE CLAY 0009 SILT 0042
CON	8	2 279	276646 4891501	485	07/66	4901	6	FR	0075	44	68	8	02:00	DO			PEISTER CYRIL GREY CLAY 0030 CLAY MSND 0055 MSND GRVL 0065 GSND 0070 GRVL 0076
CON	8	3 3149	275975 4893375	415	10/71	5016	6	FR	0050		65	10	01:00	DO			KOPP A BRWN SAND CLAY 0025 GREY CLAY 0070 GREY GRVL SAND 0071 GREY GRVL 0073
CON	8	3 3094	276025 4893200	400	10/71	5016	6	FR	0073	FLW		10	03:00	DO			HAWKINS K BRWN LOAM 0003 GREY CLAY 0073 GREY GRVL 0075
CON	8	3 280	276142	415	08/54	1343	5	FR	0043	23	25	2	03:00	DO			WOLFF MAX

MUNICIPALITY CONCESSION ETC	LOT	WELL NO	UTM EASTING NORTHING	ELEV FEET	DATE	DRILLER	CSG DIA INS	KIND OF WATER	WATER FOUND FEET	STAT LVL FEET	PUMP LVL FEET	TEST RATE GPM	TEST TIME HR:MN	WATER USE	SCREEN DEPTH FEET	SCREEN LENGTH FEET	OWNER DEPTHS IN FEET TO WHICH FORMATIONS EXTEND
CONTINUING ... BRIGHTON TOWNSHIP																	
CON	8	35	3550	276630 4895750	415	08/71	2118	6	FR	0052	15	42	10	01:00	DO			BALFOUR J PRDG 0012 GREY CLAY STNS 0052
CON	9	2	3841	275850 4895300	450	07/74	5016	6	FR	0050	15	40	5	03:00	ST			JAMIESON W BRWN SAND CLAY 0005 GREY CLAY 0050 GREY SAND GRVL 0055
CON	9	3	4243	275820 4893820	465	12/75	2104	6	FR	0060	20	50	30	04:00	ST	0056	04	BANFORD LAWRENCE BLCK LOAM SOFT 0002 GREY CLAY BLDR PCKD 0025 GREY CLAY STNS PCKD 0060 GREY GRVL SAND WBRG 0066
CON	9	5	286	275950 4893925	465	01/59	5010	6	FR	0046	17	33	3	04:00	ST	00		BUCHANAN G PROG 0018 BLDR HPAN 0046 GRVL 0046
CON	9	5	3148	275950 4893825	425	09/71	5016	6	FR	0055	15	20	5		ST			BUCHANAN C PRDG 0020 GREY CLAY 0055 GREY GRVL 0060
CON	9	7	5341	273560 4894760	575	11/79	2104	6	FR FR	0066 0195	35	53	10	10:00	ST			DUTHIE K BRWN LOAM SOFT 0002 GREY GRVL DRY LOOS 0035 BRWN CLAY MGRS LTCL 0060 BRWN MGVL MSND LTCL 0066 BRWN CLAY BLDR HARD 0193 GREY GRVL HARD 0195
CON	9	9	3955	273300 4893320	705	10/74	3129	30	FR	0020	18	30	7	01:00	DO			TUUL LEONARD LOAM 0001 CLAY SNDY 0016 BLUE CLAY 0032
CON	10	34	287	275421 4899642	430	08/64	4811	6	FR	0055	28	35	5	01:00	DO			CLARK C OWEN LOAM 0004 BRWN CLAY 0030 HPAN 0047 SHLE 0050 LMSN 0057
CON	10	35	4803	275340 4899620	425	07/77	4811		FR		25		4	01:00	DO			ROWLEY J LOAM 0004 BRWN CLAY 0027 HPAN 0048 LMSN 0060
CON	10	37	3992	274220 4899300	440	12/74	5016	6	FR	0055	15	45	5	04:00	DO			THOMPSON JOSEPH GREY CLAY 0050 GREY GRVL SAND 0053 GREY GRVL 0059
PP		63	0 0		07/51	4829	6	FR	0015	15	96		00:30	NU				WALKER E J MSND CLAY BLDR 0011 LMSN 0096
PP		67	0 0		09/52	4829	6	FR	0059	10	35	2	00:20	PS				TAYLOR E P PRDG 0012 GREY LMSN 0059
PP		288	0 0		12/47	4829	5			4								WALLACE G LOAM 0007 SHLE 0009 LMSN 0027
PP		289	0 0		12/47	4829			DRY									WALLACE G RED LOAM MSND 0007 SHLE 0009 LMSN 0058

TABLE A-3

NEW WATER WELL A027288 DESCRIPTION

Ontario Ministry of the Environment

Well Tag Numb: A027288

A027288

Well Record

Regulation 903 Ontario Water Resources Ac

page 1 of 1

ions for Completing Form

use in the **Province of Ontario** only. This document is a permanent **legal** document. Please retain for future reference.
ections **must** be completed in full to avoid delays in processing. Further instructions and explanations are available on the back of this form.
stions regarding completing this application can be directed to the Water Well Management Coordinator at 416-235-6203.
netre measurements shall be reported to 1/10th of a metre.
se print clearly in blue or black ink only.

Ministry Use Only
MUN | CON | LOT

ner's Information and Location of Well Information

e: RANDY	Last Name: MCNICHOL	Mailing Address (Street Number/Name, RR,Lot,Concession): 222 OLD WOOLER RD. RR#2			
strict/Municipality: NORTHUMBERLAND	Township/City/Town/Village: CODRINGTON	Province: Ontario	Postal Code: K0K 1R0	Telephone Number (include area code): 613-475-0635	
f Well Location (County/District/Municipality): NORTHUMBERLAND	Township: BRIGHTON		Lot: 36	Concession: 6	
et Number/Name: OLD WOOLER RD.	RR#2	City/Town/Village: CODRINGTON	Site/Compartment/Block/Tract etc.		
ding:	NAD: 83	Zone: 18	Easting: 277538	Northing: 4892477	Unit Make/Model: MAGELLAN

Mode of Operation: ☐ Undifferentiated ☒ Averaged ☐ Differentiated, specify

Overburden and Bedrock Materials (see instructions)

olour	Most common material	Other Materials	General Description	Depth From	Depth To (Metres)
BN	FINE SAND	SILT, GRAVEL		0	6.7
ON	CLAY	SAND, GRAVEL		6.7	9.14
BN	FINE SAND	SILT		9.14	19.81
ON	SAND	GRAVEL		19.81	20.42
BN	CLAY	GRAVEL, SAND		20.42	24.69
ON	SAND	GRAVEL		24.68	39.01

Hole Diameter

Metres To	Diameter Centimetres
6.10	21.91
39.01	16.82

Water Record

Kind of Water	
☒ Fresh	☐ Sulphur
☐ Salty	☐ Minerals
☒ Fresh	☐ Sulphur
☐ Salty	☐ Minerals
☐ Fresh	☐ Sulphur
☐ Salty	☐ Minerals

of well yield, water was
r and sediment free
r, specify CLOUDY
ted ☒ Yes ☐ No

Construction Record

Inside diam centimetres	Material	Wall thickness centimetres	Depth From	Metres To
Casing				
15.87	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.477	-.457	37.97
13.0	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	.477	37.03	38.1
	☐ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized			
Screen				
Outside diam 13.97	☒ Steel ☐ Fibreglass ☐ Plastic ☐ Concrete ☐ Galvanized	Slot No. 25	38.1	39.01
No Casing or Screen				
	☐ Open hole			

Test of Well Yield

Pumping test method: SUBMERSIBLE

Pump intake set at - (metres): 38.71

Pumping rate - (litres/min): 37.85

Duration of pumping: 1 hrs + 00 min

Final water level end of pumping: ____ metres

Recommended pump type: ☐ Shallow ☒ Deep

Recommended pump depth: ____ metres

Recommended pump rate: (litres/min)

If flowing give rate - N/A (litres/min)

If pumping discontinued, give reason: N/A

	Draw Down Time min	Draw Down Water Level Metres	Recovery Time min	Recovery Water Level Metres
Static Level		32.31		
1	32.52		1	32.31
2	32.67		2	32.31
3	32.67		3	32.31
4	32.67		4	32.31
5	32.67		5	32.31
10	32.67		10	32.31
15			15	
20			20	
25			25	
30			30	
40			40	
50	↓		50	↓
60	32.67		60	32.31

Plugging and Sealing Record ☒ Annular space ☐ Abandonment

et at - Metres To	Material and type (bentonite slurry, neat cement slurry) etc.	Volume Placed (cubic metres)
6.10	BENTONITE SLURRY	.48

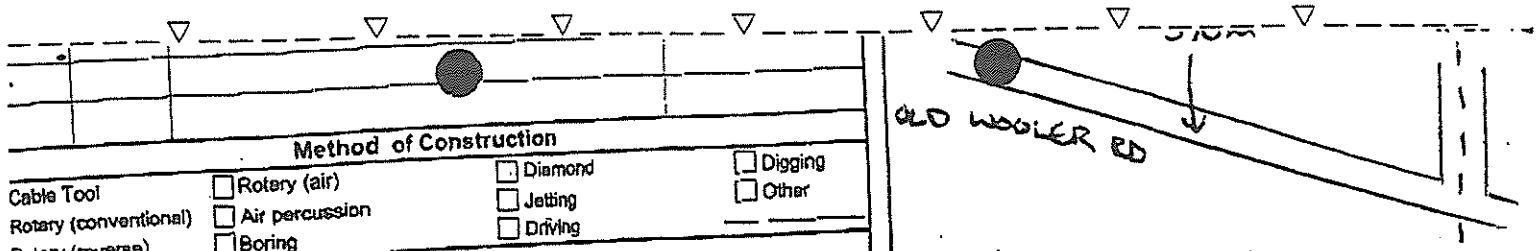
Location of Well

In diagram below show distances of well from road, lot line, and building. Indicate north by arrow.

↑N

⊗ ← 300m →

FERGUSSON



Method of Construction

Cable Tool	☐ Rotary (air)	☐ Diamond	☐ Digging
Rotary (conventional)	☐ Air percussion	☐ Jetting	☐ Other
Rotary (reverse)	☐ Boring	☐ Driving	

Water Use

Domestic	☐ Industrial	☐ Public Supply	☐ Other
Stock	☐ Commercial	☐ Not used	
Irrigation	☐ Municipal	☐ Cooling & air conditioning	

Final Status of Well

Water Supply	☐ Recharge well	☐ Unfinished	☐ Abandoned, (Other)
Observation well	☐ Abandoned, insufficient supply	☐ Dewatering	
Test Hole	☐ Abandoned, poor quality	☐ Replacement well	

Well Contractor/Technician Information

Name of Well Contractor: TRI-COUNTY WELL DRILLING

Well Contractor's Licence No.: 7028

Business Address (street name, number, city etc.): 194 PRINCE EDWARD ST BRIGHTON

Name of Well Technician (last name, first name): CROWE, JOHN

Well Technician's Licence No.: T-2388

Signature of Technician/Contractor: John Crowe

Date Submitted: YYYY 2005 MM 08 DD 31

Audit No.: Z 29298

Date Well Completed: YYYY 2005 MM 08

Was the well owner's information package delivered? ☑ Yes ☐ No

Date Delivered: YYYY 2005 MM 07

Ministry Use Only

Data Source

Date Received: YYYY MM DD

Remarks

Contractor

Date of Inspection: YYYY MM

Well Record Number

Cette formule est disponible en fra

Contractor's Copy ☐ Ministry's Copy ☐ Well Owner's Copy ☐

APPENDIX B

GROUNDWATER DETAILS

TABLE B-1
MONITOR CONSTRUCTION DETAILS
HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY
TOWN OF BRIGHTON, NORTHUMBERLAND, ONTARIO

Monitor Designation	Screen Depth		Filter Pack		Seal	
	Top	Bottom	Top	Bottom	Top	Bottom
	m bgl	m bgl	m bgl	m bgl	m bgl	m bgl
BH05-2	9.2	12.2	9.2	12.2	0	0.9
BH05-18	25.9	29.0	25.6	28.9	0	25.6
BH05-19	25.3	28.4	24.7	28.4	0	24.7
BH05-20	3.0	4.6	2.7	4.6	0	2.7
BH06-1	8.6	10.1	8.4	10.3	0	8.4

NOTE:

"m bgl" indicates metres below ground level.

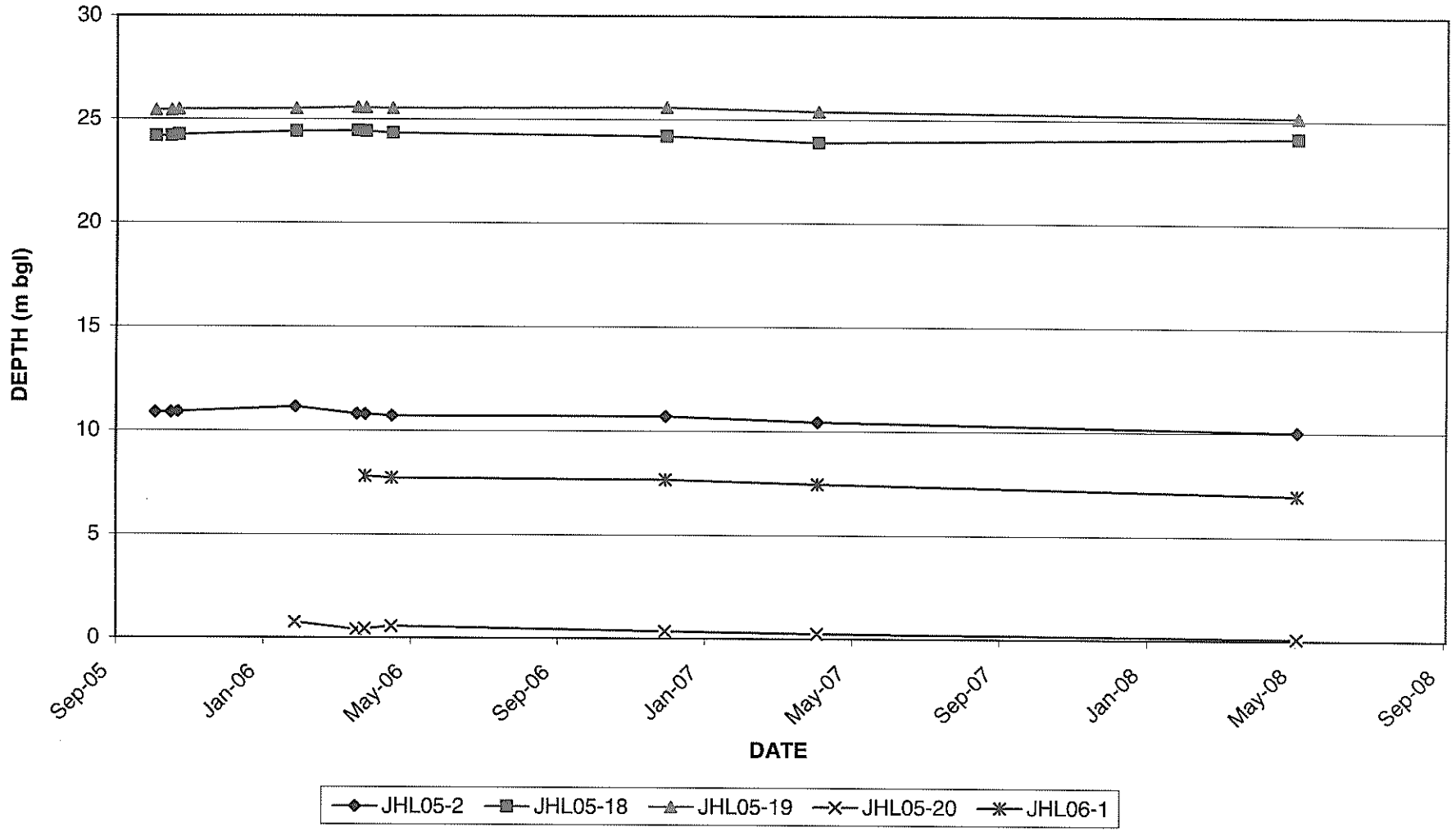
TABLE B-2
GROUNDWATER ELEVATIONS
HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY
TOWN OF BRIGHTON, NORTHUMBERLAND, ONTARIO

Monitor Designation	Measurement Point	Ground Elevations	Historic Static Water Levels									
			4- 7-Oct-05	20-Oct-05	26-Oct-05	31-Jan-06	23-Mar-06	30-Mar-06	21-Apr-06	4-Dec-06	9-Apr-07	9-May-08
	m asl	m asl	m asl	m asl	m asl	m asl	m asl	m asl	m asl	m asl	m asl	m asl
BH05-2	185.72	184.78	173.87	173.87	173.84	173.60	173.95	173.96	174.03	174.04	174.31	174.74
BH05-18	191.53	190.96	166.76	166.74	166.69	166.53	166.49	166.52	166.60	166.74	167.03	166.78
BH05-19	185.43	184.98	159.52	159.53	159.49	159.45	159.38	159.41	159.44	159.39	159.58	159.82
BH05-20	183.59	182.81	dry	dry	dry	182.04	182.39	182.36	182.23	182.54	182.54	182.71
BH06-1	183.41	182.61						174.77	174.86	174.93	175.13	175.62

NOTE:

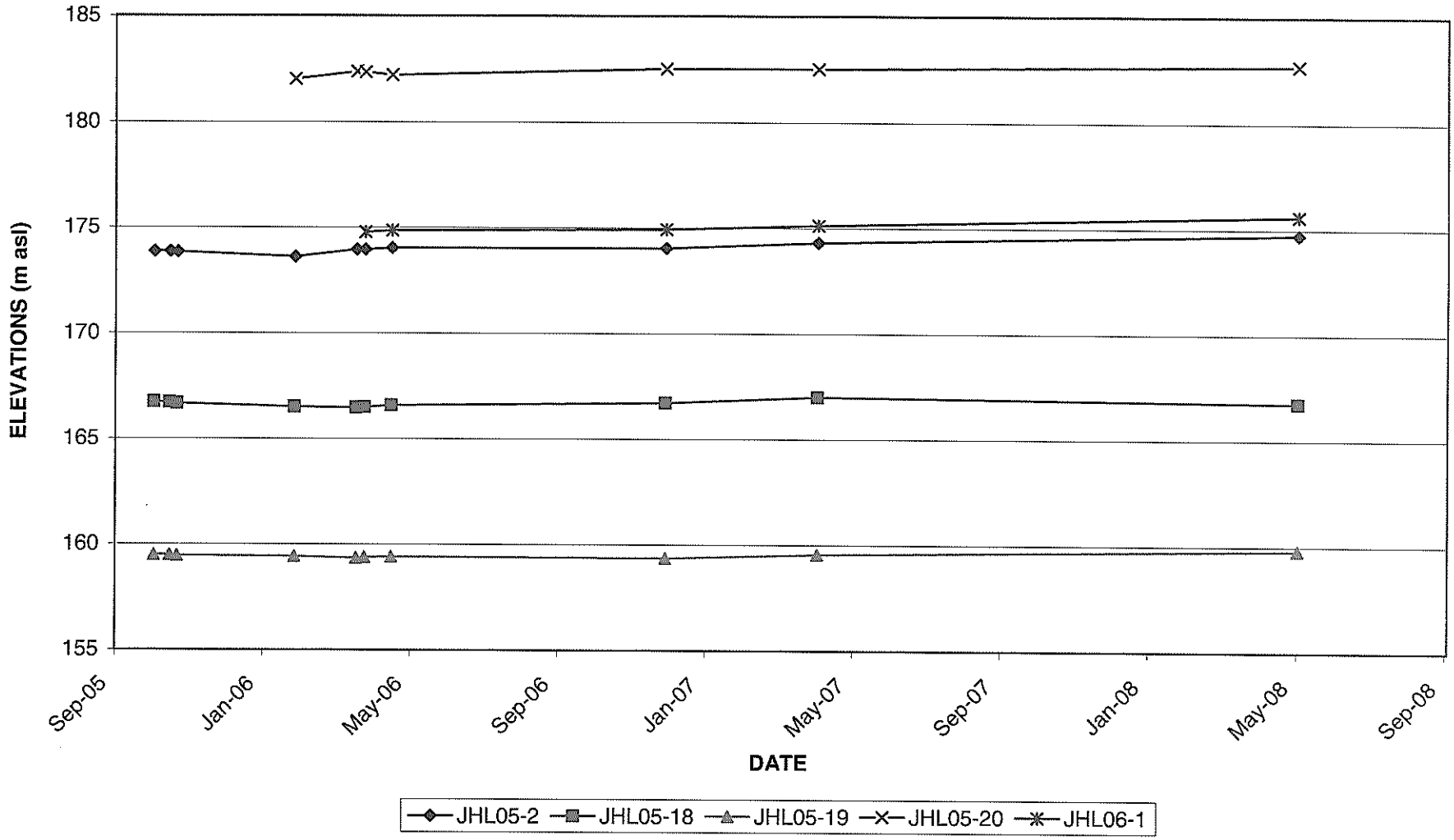
"m asl" indicates metres above sea level.

FIGURE B-1
HISTORICAL GROUNDWATER DEPTH
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY



H:\Proj\05\1777\00\Tech\TABLES\GWElevations and monitor construction details.xls

FIGURE B-2
HISTORICAL STATIC GROUNDWATER LEVELS
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY



APPENDIX C

CLIMATIC AND SUBCATCHMENTS DETAILS

- CLIMATIC WATER BUDGET – 1971-2000 TABLE C-1
- CANADIAN CLIMATE NORMALS – 1971-2000 TABLE C-2
- PRIMARY DATA FOR SITE WATER BALANCE TABLE C-3

TABLE C-1
CLIMATIC WATER BUDGET: 1971 - 2000
HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY
TOWN OF BRIGHTON, NORTHUMBERLAND, ONTARIO

	Thornthwaite (1948)									Thornthwaite and Mather (1957)					
Month	Mean Temperature (°C)	Heat Index	Potential Evapo-transpiration (mm)	Daylight Correction Value	Adjusted Potential Evapo-transpiration	Total Precipitation (mm)	Surplus (mm)	Deficit (mm)	PPT - PET (mm)	Accumulated Potential Water Loss (mm)	Storage (mm) (ST)	Change in Soil Moisture (mm)	Actual Evapo-transpiration (mm)	Moisture Deficit (mm)	Unadjusted Moisture Surplus (mm)
January	-7.1	0.0	0.0	0.7325	0.0	74	74.0	0.0	74.0	0.0	259.2	0.0	0.0	0.0	74.0
February	-5.9	0.0	0.0	0.8525	0.0	56.4	56.4	0.0	56.4	0.0	315.6	0.0	0.0	0.0	56.4
March	-0.6	0.0	0.0	0.9825	0.0	73.3	73.3	0.0	73.3	0.0	388.9	0.0	0.0	0.0	73.3
April	6.7	1.6	31.3	1.1300	35.4	74.6	39.2	0.0	39.2	0.0	100.0	0.0	35.4	0.0	39.2
May	13.7	4.6	67.0	1.2600	84.4	74.3	0.0	10.1	-10.1	-10.1	90.0	-10.0	84.3	0.0	0.0
June	18.7	7.3	93.2	1.3325	124.2	70.9	0.0	53.3	-53.3	-63.4	52.0	-38.0	108.9	15.3	0.0
July	21.6	9.1	108.6	1.3050	141.8	52.7	0.0	89.1	-89.1	-152.5	21.0	-31.0	83.7	58.1	0.0
August	20.6	8.5	103.3	1.1950	123.5	80.7	0.0	42.8	-42.8	-195.3	14.0	-7.0	87.7	35.8	0.0
September	15.9	5.7	78.5	1.0550	82.8	86.4	3.6	0.0	3.6	0.0	18.6	4.6	81.8	1.0	0.0
October	9.3	2.6	44.4	0.9075	40.3	76	35.7	0.0	35.7	0.0	54.3	35.7	40.3	0.0	0.0
November	3.2	0.5	14.3	0.7775	11.1	87.3	76.2	0.0	76.2	0.0	100.0	45.7	11.1	0.0	30.5
December	-3.5	0.0	0.0	0.7050	0.0	85.2	85.2	0.0	85.2	0.0	185.2	0.0	0.0	0.0	85.2
TOTALS (mm)		**39.9**			**643.5**	**891.8**	**443.6**	**195.3**	**248.3**	**-421.3**	**1598.8**	**0.0**	**533.2**	**110.1**	**358.6**

Total Water Surplus **248.3** **mm** **TOTAL MOISTURE SURPLUS** **358.6** **mm**

NOTES:

1) Water budget adjusted for latitude and daylight.
2) (°C) - Represents calculated mean of daily temperatures for the month.
3) Data from the Belleville Climatological Station located at latitude 44° 9' N, longitude 77° 23' W.
4) Total Water Surplus (Thornthwaite, 1948) is calculated as total precipitation minus adjusted potential evapotranspiration.
5) Total Moisture Surplus (Thornthwaite and Mather, 1957) is calculated as total precipitation minus actual potential evapotranspiration.

TABLE C-2
CANADIAN CLIMATE NORMALS: 1971-2000
HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC.(CANADA) CODRINGTON PROPERTY
TOWN OF BRIGHTON, NORTHUMBERLAND, ONTARIO

BELLEVILLE
ONTARIO

Latitude: 44° 9' N Longitude: 77° 23' W Elevation: 76.20 m
Climate ID: 6150689 WMO ID: TC ID:

Temperature:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
Daily Average (°C)	-7.1	-5.9	-0.6	6.7	13.7	18.7	21.6	20.6	15.9	9.3	3.2	-3.5	7.7	A
Standard Deviation	2.9	2.8	2.2	1.6	1.8	1.3	1.1	1.1	1.2	1.5	1.4	3	0.8	A
Daily Maximum (°C)	-2.6	-1.4	3.8	11.4	18.7	23.6	26.6	25.4	20.4	13.5	6.7	0.4	12.2	A
Daily Minimum (°C)	-11.5	-10.3	-5	2	8.7	13.7	16.6	15.7	11.3	5.1	-0.2	-7.3	3.2	A
Extreme Maximum (°C)	13.9	13	23	29	35	35.6	40	36.1	35	28.3	22.2	16.5		
Date (yyyy/dd)	1967/25	1984/24+	1998/28+	1990/25	1962/17	1964/30	1936/09	1948/26	1953/02	1877/01	1938/07	1982/03		
Extreme Minimum (°C)	-37.8	-39.4	-29.4	-17.2	-7.2	0	6.1	3.3	-1.7	-10	-22.2	-34.4		
Date (yyyy/dd)	1942/10	1934/09	1948/06	1923/01	1956/05	1945/01	1929/20+	1934/30+	1947/23	1933/26	1936/30	1871/21		
Rainfall (mm)	33.2	28	47.9	67.7	73.9	70.9	52.7	80.7	86.4	75.4	75.7	43.4	735.9	A
Snowfall (cm)	40.7	28.4	25.4	6.9	0.4	0	0	0	0	0.6	11.5	41.8	155.7	A
Precipitation (mm)	74	56.4	73.3	74.6	74.3	70.9	52.7	80.7	86.4	76	87.3	85.2	891.8	A

NOTE:

This table was adapted from the on-line resources of Environment Canada.

TABLE C-3
PRIMARY DATA FOR SITE WATER BALANCE
HYDROGEOLOGICAL STUDY
ST. MARYS CEMENT INC. (CANADA) CODRINGTON PROPERTY
TOWN OF BRIGHTON, NORTHUMBERLAND, ONTARIO

AREA DESIGNATION	TOTAL (m^2)	WOODED (m^2)	OPEN (m^2)
WETLAND CATCHMENT AREA			
1A	316617.7	125384.2	191233.5
1B	10375.5	0	10375.5
1C	6612	6612	0
1D	8692	6995	1697
1E	8854.6	1972.1	6882.5
1F	42008.6	22893.4	19115.2
1G	4662.5	1053.9	3608.6
Wetland/pond	7,297	0	7,297
Subtotal	**405119.9**	**164910.6**	**240209.3**
COLD CREEK CATCHMENT AREA			
2A	199295.9	85731.9	113564
2B	45779	8088.9	37690.1
Subtotal	**245074.9**	**93820.8**	**151254.1**
MARSH CREEK CATCHMENT AREA			
3A	6460	1362.8	5097.2
3B	16746	6879.6	9866.4
3C	41831	9709.6	32121.4
3D	14567	6781	7786
3E	25668.6	20128	5540.6
3F	7686	4545.5	3140.5
3G	250600	183338.8	67261.2
3H	41764	38571.8	3192.2
Subtotal	**405322.6**	**271317.1**	**134005.5**
SITE TOTAL	**1055517.4**	**530048.5**	**525468.9**

EXTRACTION ZONE	
WESTERN PARCEL	548042.2
EASTERN PARCEL	259454.6
TOTAL EXTRACTION ZONE	**807496.8**

NOTES:

1) 'm^2' means square metre.
2) 3A - designation of subcatchments.