



April 18, 2023

Mr. Ed Lamb
Waterford Sand & Gravel Ltd.
70 Ewart Avenue, R. R. #8
Brantford, ON N3T 5M1

**Re: Response to JART Comments
Proposed Law Quarry Extension
WSP Project No. 111-53023-11**

Dear Mr. Lamb:

We are pleased to provide our response to comments on the Level 1 and 2 Water Report for the proposed Law Quarry Extension aggregate licence application.

The Level 1 and 2 Water Study Report (Water Report) prepared by WSP Canada Inc. was submitted as part of the ARA Licence Application package in June 2022. Comments related to the Water Report were provided by the Joint Agency Review Team (JART) in their correspondence dated January 13, 2023.

The peer review consultant (Terra-Dynamics Consulting Inc.) and the Niagara Peninsula Conservation Authority (NPCA) provided comments that need to be addressed. Comments were also received from the Ministry of Transportation (MTO) relating to drainage along the Highway 3 corridor.

A copy of the JART comments (blue text) and our responses are provided below.

Peer Review Consultant Comments

1. Hydraulic Conductivity (Permeability) Descriptions and Numerical Groundwater Model - The Executive Summary described the Salina bedrock formation, which is located below the extraction depth of the quarry, as having the highest hydraulic conductivity of the bedrock formations in the vicinity of the Site. This was in contrast to the hydraulic conductivities assigned to the bedrock formations used in the predictive groundwater modelling exercise of the Site (Appendix H, Table H.4.6 Hydraulic Conductivity Parameter Values), namely that the overlying shale/shaley dolostone confining unit of Oatka Member of the Bertie Formation is also highly conductive, which is the floor of the existing quarry and the proposed floor of the western quarry extension.

This will need to be corrected for the revised Level 2 report to indicate that both the Salina Formation and the Oatka Member of the Bertie Formation are the most hydraulically conductive units in the vicinity of the Site. This issue is resolved once the report has been updated as described above.

We agree that the wording in the Executive Summary, page iv, second paragraph, line 1 should be revised to read as follows:

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“In general, the results of the hydraulic testing suggest that bedrock of the Salina Formation and Oatka Member of the Bertie Formation (i.e., the deep aquifer), located below the quarry extraction depth, are the most conductive units in the vicinity of the Site, likely as a result of enhanced weathering in these units.”

This change has been included in the Supplemental Level 1 and 2 Water Study Report (Supplemental Report).

2. Future Water Discharge Volumes from the Existing Quarry and Extension Area - As part of the surface water impact assessment, it was described that both the existing quarry, and the western extension area, would have a combined discharge increase to the Eagle Marsh Drain of 35% during the baseline spring season at a rate of approximately 10,800 m³ per day. In 2007 and 2008, Terra-Dynamics was retained by the Niagara Peninsula Conservation Authority to complete peer review tasks for the proposed Reeb Quarry directly south of the Law Quarry. On February 27, 2008, a meeting took place at the Law Quarry to assess the upward migration of groundwater through the quarry floor during frigid weather conditions. Groundwater has an ambient temperature of approximately 10°C and was the only water in liquid form on February 27, 2008. At that time, a flow rate of approximately 10,000 m³/day was recorded by Law Quarry staff hence, clarification on the possible understated flow volumes reported in the WSP 2022a report was requested of WSP staff. Through the submission of additional information, WSP explained they took over the responsibility of the groundwater monitoring program of the quarry in 2010 and that the flow meters were all upgraded and a significant decrease in discharge volumes was observed after the new, calibrated flow meter was installed at the quarry sump. Therefore, this issue is resolved.

Acknowledged.

3. Groundwater Modelling of the Potential Dewatering Impacts in the Vicinity of the Law Quarry - Groundwater model simulations were presented by WSP on the potential future impacts of (i) the Law Quarry (Figure 11, Predicted Drawdown in Deeper Bedrock Units) and (ii) the combined potential impacts of the Law Quarry, and the neighbouring Reeb Quarry (Appendix H, Figure H-11, Cumulative Impacts at Full Quarry Development – Deeper Bedrock Units), at full quarry or quarries development.

Clarification was provided by WSP in both plan view and cross-section simulation drawings indicating the drawdown of groundwater in private wells in the immediate vicinity of the quarry or quarries may require contingencies of deepening the private wells at the expense of the licensee.

These drawings are to be part of the revised Level 2 report. Potential water well interference from quarry dewatering is described in Section 4.3 Well Interference Mitigation Plan. This issue is resolved once the report has been updated as described above.

We have created model Appendix H Figure H-9A and Figure H-11A which show the model predicted groundwater contours for the Law Quarry west extension at full development, and the cumulative full development at Law and phase 1 of the Reeb Quarry. As noted in these figures, there are no groundwater contours within the quarry footprints because of the presence of the deeper dewatering sump. On Figure H-11A, there are a few contours in the southern portion of the existing quarry because the Reeb quarry sump is slightly lower in elevation (i.e., the Reeb quarry sump will underdrain the Law quarry sump at full development). The predicted drawdown shown in Figures H-9 and H-11 varies within the Law Quarry west extension footprint because the baseline water table is sloped (higher at the southwestern corner than the northeastern corner), as shown in Figure H-8 contours. In both cases, an upward gradient to the quarry will



be present at full development. The baseline and predicted deep aquifer water tables are also shown in section view in Figure H-9B and H-11B.

These additional figures have been included in the Supplemental Report.

NPCA Comments

4. The sump discharge of the new quarry will be directed to the existing sump discharge into Eagle Marsh Drain. Section 3.1.2.1 indicates that an evaluation of the flow capacity of the Eagle Marsh Drain was undertaken in 2008 to support the Reeb Quarry application and that sufficient capacity existing in the watercourse. The NPCA requests that this supporting documentation be provided for our review as the flows from the new quarry into the Eagle Marsh drain are expected to increase by 10,800 m³/day.

The Water Management Report completed by C.C. Tatham & Associates Ltd. (2008) includes an evaluation of the flow capacity within Eagle Marsh Drain (EMD). A scanned PDF copy of the report will be provided to NPCA electronically.

We note that the total flow increase to EMD is not 10,800 m³/day. As stated on in Section 3.1.2.1 (page 31) of the Water Report, the baseline data for the existing quarry discharge in the spring averages approximately 8,000 m³/day. The proposed quarry Extension would increase this discharge by 35%, to 10,800 m³/day. Therefore, the additional discharge to EMD above baseline conditions is predicted to be 2,800 m³/day during spring conditions.

It is important to note that the existing sump pump and the discharge rate will not be altered once excavation of the Extension lands proceeds; therefore, the current instantaneous discharge flow rate to EMD will not change. Rather, the pump will be run for longer periods to account for the increased groundwater inflows and increased incident precipitation due to the larger quarry footprint.

5. There is a proposed surface water monitoring program in the Eagle Marsh Drain but no contingency plan is provided if the parameters that are being monitored are exceeded. Exceedance thresholds should be provided and a contingency plan should be in place.

We note that Waterford submitted a pre-consultation letter to the Ministry of the Environment, Conservation and Parks (MECP) regarding an Environmental Compliance Approval for Industrial Sewage Works (ECA) for the existing quarry discharge in December 2020. To date, the MECP has not provided a response to the pre-consultation letter or additional follow-up requests from Waterford.

The MECP Technical Support Section (TSS) recently provided comments on the Water Report, in which they indicate that standard effluent criteria for ECAs related to quarry discharge include TSS (25 mg/L), oil and grease (15 mg/L) and pH (between 6.0 and 9.0). In addition, the MECP suggested that criteria be adopted for undissociated hydrogen sulphide based on the quarry discharge results to date. The Provincial Water Quality Objective (PWQO) for undissociated hydrogen sulphide is 0.002 mg/L.

The MECP noted that elevated concentrations of boron above the PWQO (0.2 mg/L) are observed in the quarry discharge; however, concentrations are below the Canadian Water Quality Guideline for the Protection of Aquatic Life (CWQG) of 1.5 mg/L. The MECP noted that *“as the CWQG is a more recently developed guideline value it is acceptable to use the CWQG for boron in place of the PWQO”*. Therefore, analysis for boron will continue to be included in the annual monitoring program; however, we do not believe an ECA effluent criterion for boron is warranted.



The proposed effluent criteria for the ECA are noted in the table below. A contingency plan for criteria exceedance is shown on attached **Figure 1**.

Parameter	Proposed Effluent Criteria
pH (pH units)	6.0 – 9.0
TSS	25
Hydrogen Sulphide (undissociated)	0.002
Total Oil and Grease	15

Notes: Effluent criteria in mg/L unless otherwise noted.

6. The surface water monitoring program should include erosion monitoring and a contingency plan.

As previously stated in our response to comment 4, the existing sump pump and the discharge rate will not be altered once excavation of the Extension lands proceeds; therefore, the current instantaneous discharge flow rate to EMD will not change. The existing sump (which includes a sediment forebay to prevent erosion and minimize downstream sedimentation) has operated in the current configuration for decades with no known issues. Nevertheless, we propose that the monitoring program for the ECA compliance should include annual inspection of the sediment forebay and discharge channel. The results of the erosion monitoring will be included in the annual monitoring report. Should unacceptable erosion be observed, repairs or modifications to the sediment forebay and / or improvements to the discharge channel will be completed in a timely fashion. This process has informally been undertaken at the Site for many years.

7. The quarry proposes to stop all dewatering discharge during rainfall events greater than 25mm in order to prevent downstream flooding. The NPCA is supportive of this. In addition to events greater than 25mm precipitation events, perhaps quarry discharge operations should cease when the flood gate is closed due to high Lake Erie water levels or storm surges. If this is unrealistic, we understand that pumps at the Eagle Marsh flood gate operate if necessary when the gate is closed, an assessment should be done to determine if the capacity of these pumps are able to handle the increased discharge from quarry operations.

Again, we note that the existing sump configuration will not be altered once excavation of the Extension lands proceeds; therefore, the current instantaneous discharge flow rate to EMD will not change. The existing sump has been operated in the current configuration for decades with no known issues. We do not believe that it is practical or necessary to coordinate quarry discharge to the flood gate operations.

The Water Management Report (C.C. Tatham & Associates Ltd., 2008), Section 2.0, page 2, notes that when the flood gates are closed, the City of Port Colborne operates the pumps at a maximum rate of 61,500 L/min (88,560 m³/day).

8. Section 4.1 indicates that well nest MW4 and monitoring wells GLL-7 and GLL-8 are within the zone of extraction and will eventually have to be removed. The NPCA would recommend that new wells be



drilled as early as possible prior to decommissioning in order to obtain robust baseline data sets for these new wells.

As shown in Figure 2 of the Water Report, monitoring wells GLL-7 and GLL-8 are situated within the central portion of the proposed extraction area. Their main function was to assess pumping tests for quarry licencing and bedrock resource and were not designed to act as perimeter sentry wells. The western limit of the proposed Law Quarry extension already includes three (3) monitoring well nests (MW6, MW9 and MW10), while the southern limit of the extension includes an additional two (2) well nests (MW4 and MW12). Therefore the existing monitoring well coverage of the proposed Extension lands is sufficient for groundwater monitoring and no further monitoring well nests are required.

9. The NPCA has no issues or comments with the assessment of the hydrogeological regime.

Acknowledged.

MTO Comments

10. It is noted that there will be 35% increase in flow to Eagle Marsh Municipal Drain as a result of Quarry expansion. This could impact drainage along Highway 3 ditches and cross culverts.

The proponent should provide more details including calculations and plans that Highway 3 drainage will not be impacted.

As noted in the Water Management Report (C.C. Tatham & Associates Ltd., 2008), Section 2.2, page 3, the conveyance capacity of the EMD culvert under Highway 3 is 3.0 m³/s. As noted in Appendix D of the Law Quarry 2021 Annual Permit to Take Water Monitoring Report (WSP, March 2022), the existing sump discharges at an average rate of approximately 12,600 L/min (0.21 m³/s), which is equivalent to 7% of the conveyance capacity of the culvert. The existing sump configuration (i.e., the pump and the discharge rate) will not be altered once excavation of the Extension lands proceeds; therefore, the current instantaneous discharge flow rate to EMD will not change.

11. The MTO doesn't allow any increase in flow for 5, 10, 25, 50 and 100 year storm events to its drainage system. One of the proposed outlets is Eagle Marsh Drain. Please indicate all outlets on mosaics along with drainage boundaries and major flow directions.

We can confirm that the quarry discharge flow will not increase from current conditions. The existing quarry discharge configuration, subcatchment areas and flow directions are shown in plan view on attached **Figure 2**.

12. Please indicate a 14m setback from MTO right-of-way on all Site Plan drawings.

We interpret this comment to indicate that the 14m setback is to be shown on the ARA Site Plans, rather than the figures included in the Water Report.



CLOSURE

We trust that these responses and supporting information are sufficient for your needs. Please contact us if there are any further questions.

Yours truly,
WSP Canada Inc.

A handwritten signature in blue ink that reads "Kevin Fitzpatrick".

Kevin Fitzpatrick, P.Eng.
Senior Project Engineer, Earth & Environment

A handwritten signature in blue ink that reads "Leigh Davis".

Leigh Davis, M.A.Sc., P.Eng.
Project Engineer, Earth & Environment

Attachments: WSP Canada Inc., April 2023. Proposed Law Quarry Extension Supplemental Level 1 and 2 Water Study Report, prepared for Waterford Sand & Gravel Ltd.
C.C. Tatham & Associates Ltd., January 2008. Township of Wainfleet, Reeb Quarry Water Management Report, prepared for M.A.Q. Aggregates, Inc.
Figure 1 – Proposed Quarry Discharge Trigger Mechanism and Contingency Plan
Figure 2 – Quarry Discharge Configuration



April 18, 2023

Mr. Ed Lamb
Waterford Sand & Gravel Ltd.
70 Ewart Avenue, R. R. #8
Brantford, ON N3T 5M1

**Re: Supplemental Level 1 and 2 Water Study Report
Proposed Law Quarry Extension
WSP Project No. 111-53023-11**

Dear Mr. Lamb:

We are pleased to provide this Supplemental Level 1 and 2 Water Study Report (Supplemental Report) for the proposed Law Quarry Extension aggregate licence application by Waterford Sand & Gravel Ltd. (Waterford).

The initial Level 1 and 2 Water Study Report (Water Report) prepared by WSP Canada Inc. (March 2022) was submitted as part of the ARA Licence Application package in June 2022. Comments related to the Water Report were provided by the Joint Agency Review Team (JART) in their correspondence dated January 13, 2023.

The purpose of this Supplemental Report is to address comments provided by the JART peer review consultant (Terra-Dynamics Consulting Inc.). Two (2) modifications to the Water Report are noted below and are applicable to the original report (appended to this technical memorandum).

Modified Executive Summary

The wording in the Water Report Executive Summary, page iv, second paragraph, line 1 should be revised to read as follows:

“In general, the results of the hydraulic testing suggest that bedrock of the Salina Formation and Oatka Member of the Bertie Formation (i.e., the deep aquifer), located below the quarry extraction depth, are the most conductive units in the vicinity of the Site, likely as a result of enhanced weathering in these units.”

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Additional Model Report (Appendix H) Figures

Model report (**Appendix H**) **Figure H-9A** and **Figure H-11A** have been created to show the model predicted groundwater contours for the Law Quarry west extension at full development, and the cumulative full development at Law Quarry and phase 1 of the Reeb Quarry and are appended to this technical memorandum. As noted in these figures, there are no groundwater contours within the quarry footprints because of the sump elevation. On **Figure H-11A**, there are a few contours in the southern portion of the existing quarry because the Reeb quarry sump is slightly lower in elevation (i.e., the Reeb quarry sump will underdrain the Law quarry sump at full development). The predicted drawdown shown in **Figures H-9 and H-11** varies within the Law Quarry west extension footprint because the baseline water table is sloped (higher at the southwestern corner than the northeastern corner), as shown in **Figure H-8** contours. In both cases, there will still be an upward gradient to the quarry at full development. The baseline and predicted deep aquifer water tables are also shown in section view in **Figure H-9B and H-11B** (appended).

CLOSURE

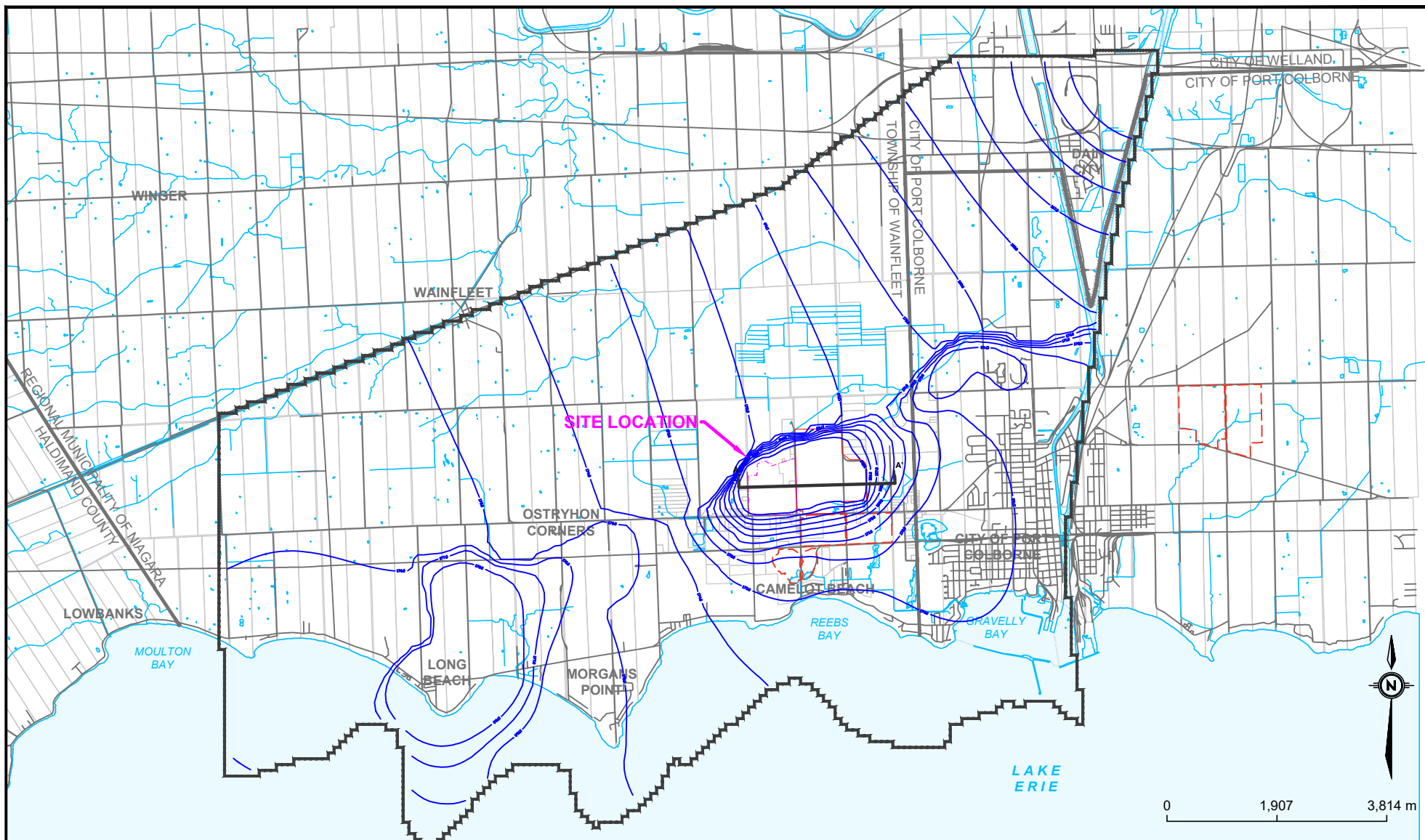
We trust that this Supplemental Report is sufficient for your needs. Please contact us if there are any further questions.

Yours truly,
WSP Canada Inc.

Kevin Fitzpatrick, P.Eng.
Senior Project Engineer, Earth & Environment

Leigh Davis, M.A.Sc., P.Eng.
Project Engineer, Earth & Environment

Attachments: **WSP Canada Inc., March 2022. Law Quarry Extension Level 1 and 2 Water Study Report, prepared for Waterford Sand & Gravel Ltd.**
Figure H-9A – Predicted Groundwater Contours at Full Quarry Development – Deeper Bedrock Units
Figure H-9B – Cross Section A-A'
Figure H-11A – Cumulative Impacts at Full Quarry Development – Deeper Bedrock Units
Figure H-11B – Cross Section C-C'



LEGEND	
	ACTIVE MODEL DOMAIN
	172.0 SIMULATED GROUNDWATER CONTOURS, 1 m INTERVALS (mASL)
	CROSS SECTION LOCATION

PREDICTED GROUNDWATER CONTOURS AT FULL QUARRY DEVELOPMENT - DEEPER BEDROCK UNITS

NUMERICAL GROUNDWATER MODEL REPORT
LAW QUARRY EXTENSION
WAINFLEET, ON
For Waterford Sand & Gravel Ltd.

DATE:	SEPTEMBER 2022
PROJECT:	111-53023-05
DRAWN BY:	JLD
SCALE:	1 : 95,358


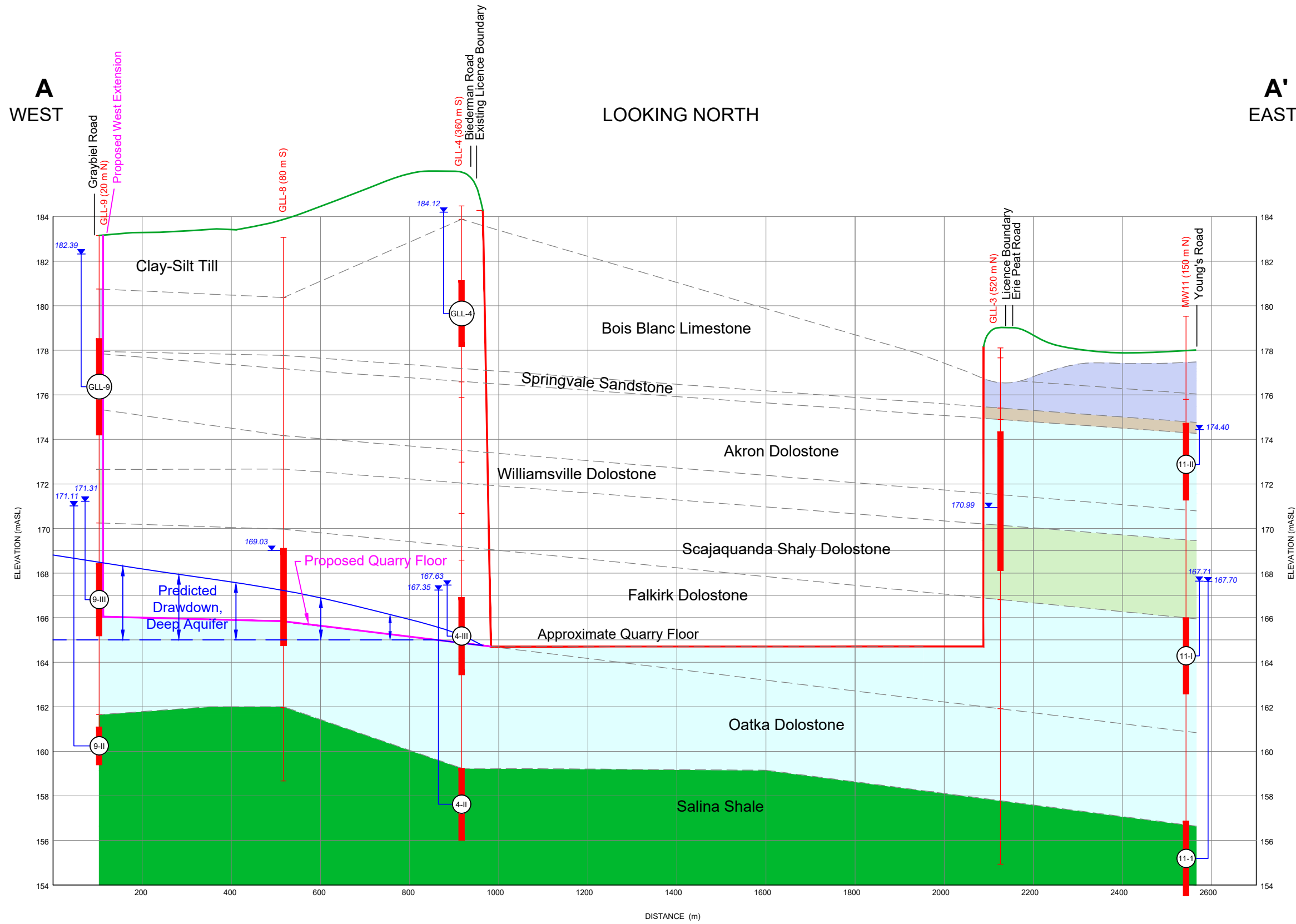


FIGURE No. **H-9A**

A
WEST

A'
EAST

LOOKING NORTH



LEGEND

- BOREHOLE LOCATION AND DESIGNATION
- SURFACE
- ▼ WATER LEVEL (FEBRUARY 4, 2019)
- CHANGE IN STRATIGRAPHY
- SCREENED INTERVAL
- | END OF HOLE
- LIMESTONE
- DOLOSTONE
- SHALY DOLOSTONE
- SHALE
- SANDSTONE
- BASELINE INTERPRETED DEEP WATER TABLE
- - - PREDICTED DEEP WATER TABLE AT FULL QUARRY DEVELOPMENT

REFERENCE: GARTNER LEE LTD. (2005).

CROSS SECTION A-A'

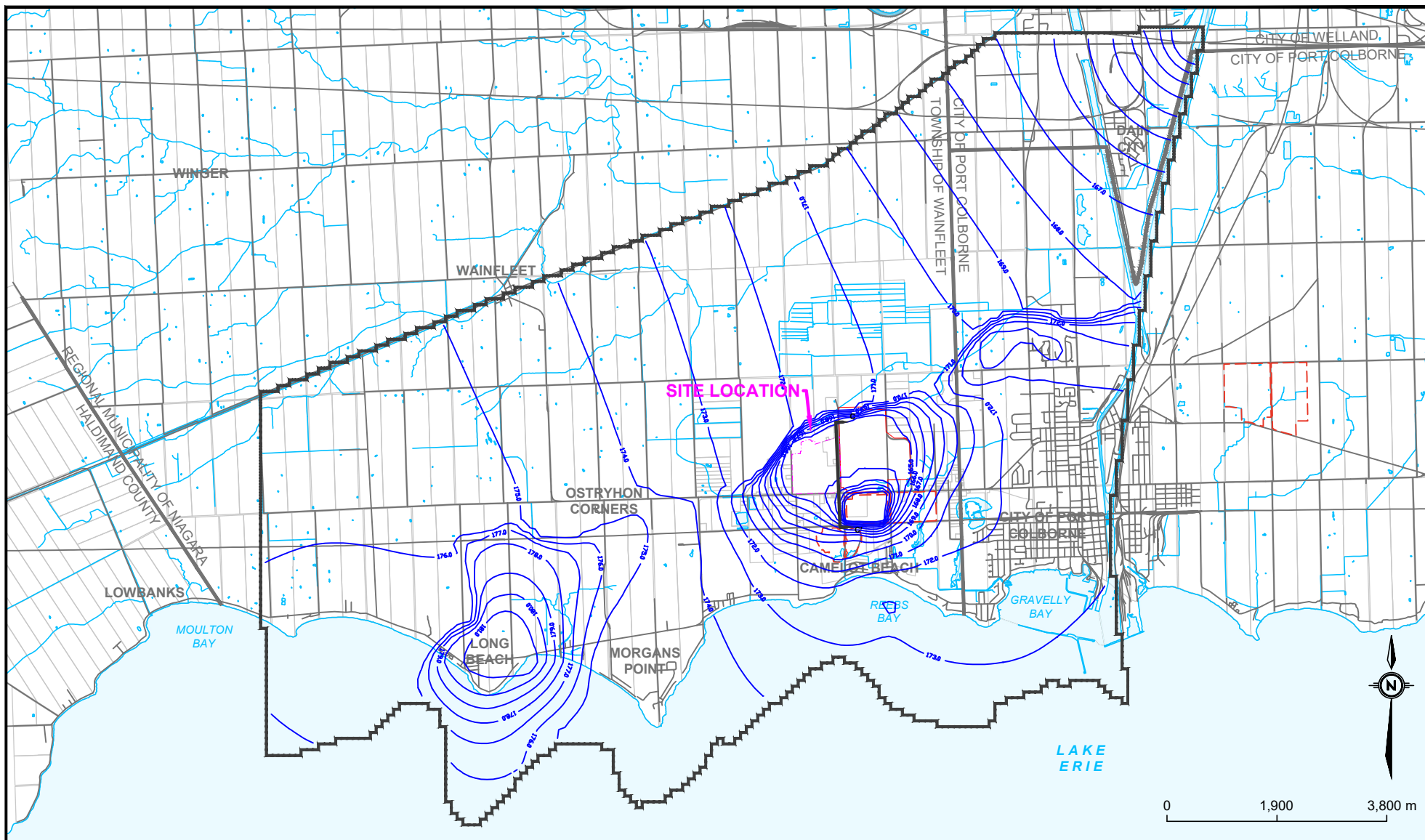
LEVEL 2 WATER STUDY REPORT
LAW QUARRY EXTENSION
WAINFLEET, ON
For Waterford Sand & Gravel Ltd.

DATE:	SEPTEMBER 2022
PROJECT:	111-53023-06
SCALE:	AS SHOWN
DRAWN BY:	JLD



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FIGURE No: **H-9B**



LEGEND

- ACTIVE MODEL DOMAIN
- 172.0 SIMULATED GROUNDWATER CONTOURS, 1 m INTERVALS (mASL)
- C** CROSS SECTION LOCATION

CUMULATIVE IMPACTS AT FULL QUARRY DEVELOPMENT - DEEPER BEDROCK UNITS

NUMERICAL GROUNDWATER MODEL REPORT
 LAW QUARRY EXTENSION
 WAINFLEET, ON
 For Waterford Sand & Gravel Ltd.

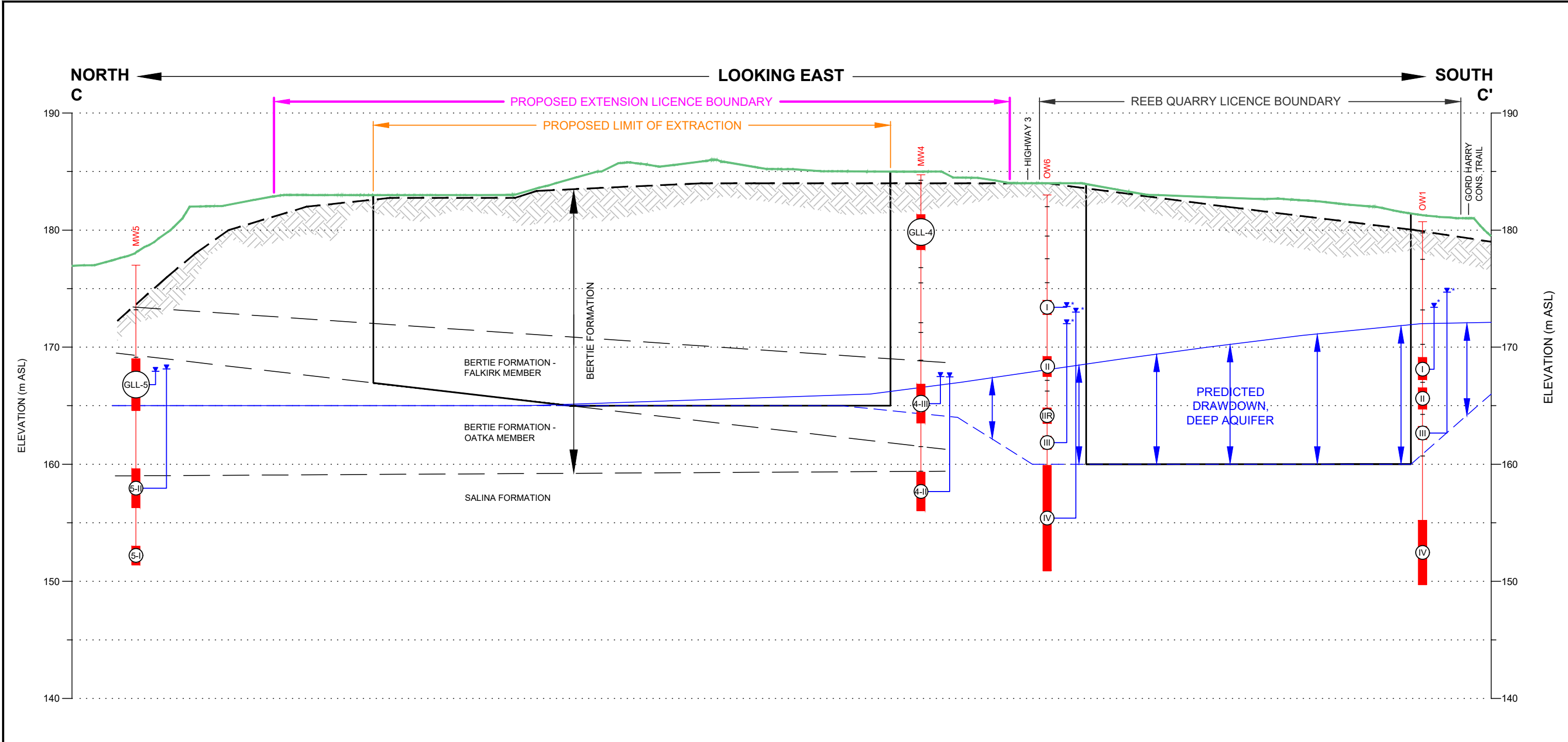
DATE: SEPTEMBER 2022

PROJECT: 111-53023-05

DRAWN BY: JLD

SCALE: 1 : 95,000

FIGURE No: **H-11A**





C. C. TATHAM & ASSOCIATES LTD.

Collingwood

Orillia

Bracebridge

Barrie

TOWNSHIP OF WAINFLEET REEB QUARRY

WATER MANAGEMENT REPORT

File No. 104053
January 2008

Consulting Engineers

115 Sandford Fleming Drive, Suite 200
Collingwood, Ontario L9Y 2L9

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FIGURES

Fig. 1 Location Plan

APPENDICES

Appendix A Existing Conditions Hydrologic Model
Appendix B Hydraulic Analysis
Appendix C Water Balance Analysis
Appendix D Eagle Marsh Drain Water Level Monitoring Data

DRAWINGS

Existing Overall Drainage Plan (Drawing DP-1)

1 INTRODUCTION

C.C. Tatham and Associates, Ltd (CCTA) is retained by M.A.Q. Aggregates, Inc. (MAQ) to prepare water management reports to support applications for Certificate of Approvals (CoA) in accordance with Section 53 of the Ontario Water Resources Act (OWRA). Previously, this work was completed subsequent to Aggregate Resources Act (ARA) licencing. For the Reeb Quarry, MAQ has retained CCTA to prepare a water management report to address the plan proposed for surface discharge, in support of the ARA licence.

1.1 BACKGROUND

The subject site consists of 96.8 ha of undeveloped land bound to the north by Highway 3, to the east and west by Cement Plant Road and Quarrie Road respectively and to the south by a former rail berm. The legal description of the site is Part of Lots 2, 3, 4 and 5, Concession 1 in the Township of Wainfleet. The site is bisected by Bessey Road which runs north/south from Highway 3. Of the total site area, 70 ha is proposed to be licensed with 51.2 ha intended for extraction and 18.8 ha surrounding the Eagle Marsh Drain (EMD) to remain undisturbed. An Existing Features Plan and Operations Plan (Amended January 31, 2008) have been prepared by Azimuth Environmental Consulting (Azimuth) for the site to accompany the ARA license application.

An initial Water Management Strategy presented in the Azimuth report "Level 2 Hydrogeological Assessment: Reeb Quarry" (2005) recommended that surface runoff from the quarry and groundwater inflow to the quarry floor be discharged to the Eagle Marsh Drain. An alternate solution to construct a forcemain that would convey discharge from the site directly to Lake Erie was also considered, but this proposal was rejected by the Township. In response, a Water Management Strategy was completed by Azimuth in September, 2007 which detailed a plan to store the water generated on the site either from runoff or quarry operations in a storage pond and release it at a controlled rate during the summer months. The following report has advanced the results of these past studies through additional analysis and the water management plan has been revised and presented herein to reflect the latest results. This report replaces all previous surface water management work and reports for the proposed Reeb Quarry. *

1.2 OBJECTIVES

The primary objective of this report is to demonstrate that the water to be discharged from the proposed quarry will not adversely impact the EMD and local water resources. This will be accomplished by evaluating the effect of the land use changes from the quarry operation on the local drainage conditions and, where necessary, provide solutions to mitigate any adverse impacts. The water management plan will address the following requirements:

- Determine existing runoff conditions from the site
- Establish the limiting capacity of the site outlet (EMD)
- Prepare annual water balance calculations to determine potential water surplus from the site and required storage volumes
- Determine required allowable discharge rates and storage volumes for varying quarry operation conditions
- Prepare an overall water management plan that complies with the appropriate technical guidelines and the Operations Plan for the site.

2 EXISTING DRAINAGE CONDITIONS

The site is currently covered by a mixture of agricultural land, pasture and forested area. Site soils are predominantly clay with areas of loam overlying bedrock. Surface water drains overland at slopes of less than 1% to the EMD, which runs through the property, just east of the proposed limit of the extraction, and flows from north to south. Bessey Road bisects the site and a 300 mm diameter cross culvert allows

12" ϕ

surface flow to drain from the west half of the site across Bessey Road to the east via an intermittent drainage course that outlets to the EMD. It is noted that this 300mm dia. CSP is currently partially blocked and has limited conveyance capacity resulting in drainage ponding periodically on the fields on the west side of Bessey Road during significant melt/rainfall events. The EMD enters the site after crossing Highway 3 via a 3750 x 1600 pipe arch culvert and exits the site at the rail berm via 2-1450 mm diameter culverts. Directly downstream of the rail berm is a local feature known as the Clay Pits, a small lake system that was created from previous clay excavation in the area.

LIMIT

*

The EMD flows south and then turns east, where it crosses Cement Plant Road and ultimately reaches Lake Erie. The total drainage area to the EMD outlet is 1,084 ha, with 483 ha of area contributing to the drain upstream of the Reeb property. Included in the area upstream of the Reeb site is a 136 ha quarry operated by the Hard Rock Paving Company known as the Law Quarry. The full extent of the EMD and its catchment areas is shown in the Existing Conditions Drainage Plan (Drawing DP-1) which is appended to the report.

Also of note in the existing system, a flood gate was installed at the downstream end of the EMD in 1977 by the City of Port Colborne. The purpose of the flood gate is to protect against storm surges on Lake Erie in excess of 175.2 m in the summer months and 175.0 in the fall, which have been known to cause historical flooding problems in the EMD due to backwater effects. When the flood gate is closed flow from the EMD is pumped over the flood gate to Lake Erie at a reported maximum rate of 61,500 L/min (1.02 m³/s).

2.1 HYDROLOGY

Existing condition peak flow rates for the EMD system were calculated using the OTTHYMO hydrologic model, with IDF data for St. Catharines distributed as a 4-hour Chicago storm. The catchments were modelled as rural due to the low overall imperviousness of each catchments area. Land cover, soil type and slope were used as basic inputs to generate model parameters such as Curve Number, time to peak and initial abstractions. Runoff prediction from the Law Quarry site differs from other catchments as surface flow generated on the site is controlled and discharged by pump at a maximum rate of 10,000 L/min (0.17 m³/s) 365 days per year and was modelled accordingly.

$$= 5.256 \text{ m}^3/\text{yr}$$

The event based flow results are summarized in the following Table 2.1 and model input parameters and detailed results are included in Appendix A. The hydrologic analysis was carried out with two purposes in mind. The first purpose was to use the values as a point of comparison for flow leaving the Reeb site under the proposed development condition and the second was to provide an input to the hydraulic model ~~to assist in determining the capacity of the EMD.~~ With these basic purposes in mind, any basin or wetland area storage provided upstream or downstream of the site (Clay Pits, Cement Plant Lakes) was not considered. As the flow rates downstream of the site are used only for the capacity analysis the higher predicted flow rate is more conservative in this case and considered acceptable. This method of analysis is typical when predicting potential flood flows for a drainage system. With the collection of monitoring data which is now occurring on the system, calibration of these flow estimates can also occur.

Township of Wainfleet
Reeb Quarry
Water Management Report

Table 2.1
Existing Condition Flow Summary:

Storm Event	Flow Contribution from Reeb Site (Catchment 103) m ³ /s	Upstream End of Reeb Site (Node 301) m ³ /s	Downstream End of Reeb Site (Node 304) m ³ /s	@ Cement Plant Road (Node 306) m ³ /s	@ Lake Erie (Node 307) m ³ /s
2-year	0.47	1.78	2.42	3.29	3.97
5-year	0.68	2.46	3.38	4.61	5.55
10-year	0.86	3.05	4.20	5.74	6.90
25-year	1.14	3.97	5.49	7.54	8.94
50-year	1.37	4.71	6.52	8.97	10.74
100-year	1.62	5.54	7.69	10.60	12.68

2.2 HYDRAULICS

The capacity of the EMD had not previously been determined through hydraulic analysis so a preliminary HEC-RAS hydraulic backwater model was set up to assess the EMD conveyance capacity. Survey data gathered by CCTA on December 27, 2007 was used to create the model cross sections, which include channel and overbank geometry and culvert crossing data. Design storm flow data generated by the OTTHMYO hydrologic model was then applied to evaluate channel capacity. The water level at Lake Erie, based on Water Survey of Canada water level for data for Lake Erie at Port Colborne, was used as a starting water surface elevation for the analysis. The mean water level during the highest month of the year (July) for the duration of the dataset (1911-2006), which is (174.34 m) was applied for the initial run. Higher downstream starting water levels were also considered in the analysis up to the storm surge elevation of 175.2 m that triggers the closure of the flood gate. Details of this sensitivity analysis are included in Appendix B. Basically the analysis confirms that good channel capacity is available until a downstream Lake Erie water elevation of 175.0 – 175.2 is reached. After which time, it was found that the EMD banks are at or just below the 175.2 m elevation in the vicinity of Cement Plant Road through to the Clay Pits area and the EMD channel does not have conveyance capacity in this instance and the flood gates are enacted and water is pumped over the flood gate at 1.02 m³/s. This condition does not occur on a sustained basis and is usually just a result of storm events that create the right wind/wave set-up condition.

The HEC-RAS model produces water surface elevations for each flow rate that is specified. Based on this information, it was possible to approximate the capacity of each section of the EMD by selecting the design storm that produced a water surface elevation closest to the top of bank of the channel section. It was determined that the limiting capacity of the EMD is approximately 2.10 m³/s under regular backwater (Lake Erie water level) conditions and occurs at the downstream end of the Reeb site at the rail line crossing. A summary of the HEC-RAS results is provided below in Table 2.2 and detailed model results are included in Appendix B.

Table 2.2
Eagle Marsh Drain Conveyance Capacity Summary

Location	Conveyance Capacity (m ³ /s)
Hwy 3 @ upstream end of Site	3.0
Rail Crossing Downstream End of Site	2.1
Cement Plant Road	9.1

is this too high?

In February 2005, Azimuth began collecting water level data in the EMD in the vicinity of the site using two continuous level loggers. One logger was installed at the Highway 3 crossing at the upstream end of the site and the second at the rail crossing at the downstream end of the site. In November, 2007 a third logger was installed at the Cement Plant Road crossing. The data collected to date provides useful information on the flow regimes observed in the system and can be used going forward to calibrate the models and fine tune the water management plan. A summary of this data is included in Appendix D.

2.3 PROPOSED DISCHARGE REGIME

Based on the above analysis an allowable discharge rate was developed for the site. Given the Reeb site area to be quarried accounts for roughly 10.5% of the drainage area of the EMD at the downstream limit of the site and contributes approximately 12% of the flow during a 2 year storm event an allowable discharge rate to the EMD in the order of 10-12% of the threshold capacity of 2.1 m³/s was selected as a value that could easily be accommodated by the EMD under regular flow conditions. On this basis the value of 0.235 m³/s (~14,000 L/min) was considered a maximum discharge rate for the quarry that could be adjusted based on quarry phasing and preceding EMD conditions (either precipitation/melt events or high Lake Erie water levels). *GW inflow included?*

Considering the maximum continuous existing discharge from the Law Quarry is 0.167 m³/s and the fact that under a worst case downstream water level conditions the maximum flow that can be discharged over the flood gate at Lake Erie is 1.02 m³/s, half of the maximum allowable discharge of 0.235 m³/s, or 0.115 m³/s, has been chosen as the Phase 1A release rate from the quarry as follows:

- For the months with lower than average runoff (June, July, August, December, January, February) we are proposing a release rate from the quarry at 0.115 m³/s (7,000 L/min).
- For the months with the higher runoff potential (September, October, November, March, April, May) we are proposing to reduce this discharge release rate amount to 0.058 m³/s (3,500 L/min).
- To be conservative in determining our required site storage volume, our water balance analysis will assume that no discharge will occur during precipitation/melt days or on the day following a precipitation or melt day.
- The release rate can be increased to 0.23 m³/s depending on verification from monitoring that would occur through Phase 1.

To confirm the suitability of the above noted release rates and required on-site storage volumes to accommodate these release rates a water balance was generated for the site. The following Section 3.0 presents the results of this water balance in detail.

3 WATER BALANCE

A water balance model was developed to quantify the water surplus that will be generated by the Reeb Quarry and determine the required on-site storage volumes to ensure water is released from the site in a manner that will not adversely affect the EMD.

The water balance was set up to calculate daily water surplus depths across the site using daily climate data from Environment Canada for the Port Colborne meteorological station for the time period between 1965 and 2006. The climate data used in the water balance calculations were mean daily temperature, rainfall depth and snowfall depth.

The basic equations used in the analysis are as follows:

Surface Water Surplus/Deficit (mm) = Rainfall + Snowmelt – Evaporation - Infiltration

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Storage Volume (m³) = (Surface Water Surplus/Deficit + Groundwater Inflow - Allowable Release) x Quarry Area

As can be described with the following definitions:

- Rainfall (mm): Precipitation that was recorded to fall as rain.
- Snowmelt (mm): Precipitation that falls as snow and melts at a rate increasing with temperature per the U.S. Army Corps of Engineers relationship (i.e. depth (mm/day) = 1.54 ((T x 1.8) + 8) where T is average daily temperature in °C.
- Evaporation (mm): Daily evaporation rates estimated using the Hamon equation and cross-checked with documented monthly and annual values.
- Infiltration (mm): Precipitation that is lost due to infiltration. Note for this analysis it has been conservatively assumed that infiltration losses are zero.
- Storage Volume (m³): Cumulative storage required on-site for given quarried area.
- Surface Water Surplus/Deficit (mm): Total water generated in the system of rainfall and snowmelt less losses due to evaporation.
- Groundwater Inflow (m³/yr): Quarry operations will generate a surplus of groundwater. Azimuth have quantified this value for normal quarry operations for the Phase 1A development at 257,000 m³/year and for the ultimate development at 640,000 m³/year. It was conservatively assumed that the groundwater influx would occur at the maximum rate throughout the lifespan of the quarry and that this volume was evenly divided over the year. Azimuth has also provided values for groundwater influx based on high or worst case groundwater inflow conditions at 804,140 m³/year for Phase 1A and 2,000,000 m³/year for the ultimate condition. These worst case inflow values will also be considered in the analysis.
- Quarried Area (Ha): Area of the quarry operation. For this analysis 17 Ha for Phase 1A and 51.8 Ha for Phase 2 (ultimate condition).
- Allowable Release (L/min): The allowable release rate from the storage pond as described in Section 2.3 at 7,000 L/min for summer/winter and 3,500 L/min for spring/fall. No release was allowed on days when rainfall or snowmelt had occurred or the day after rainfall/snowmelt. The allowable release rate was assumed to occur at the peak rate on a constant basis for 24-hours. For the ultimate condition with the high or worst case groundwater condition, the release rate was increased to the maximum of 14,000 L/min in summer/winter and 7,000 L/min for spring/fall.



This analysis was run on a daily basis with atmospheric data from 1965 until 2006. The required storage volume was analyzed and the maximum daily storage volume that occurred over the 41 year water balance calculation period was documented. The maximum event based storage volume calculated using the runoff from the 100-year (Regulatory) storm event from the site was added to the water balance based storage volume to allow for the highly improbable event that the Regulatory storm were to occur when the storage volume in the pond was at its maximum. Table 3.1 summarizes the results of the water balance analysis, while detailed results are provided in Appendix C. Graphs depicting maximum,

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minimum and average annual storage volume requirements are also attached in Appendix C to show the volumes as they accumulate/dissipate throughout the year.

Table 3.1
Maximum Required Pond Storage Volume

Phase	Required On-site Maximum Storage Volume Predicted from Water Balance Analysis (m ³)	
	Regular Groundwater Inflow	Maximum (Worst Case) Groundwater Inflow
1A	48,337	176,438
2	324,876	739,835*

- *worst case groundwater condition with the ultimate development has assumed a higher discharge rate of 7,000 L/min during spring and fall and 14,000 L/min in summer/winter.*

4 PROPOSED SITE DEVELOPMENT

The Reeb Quarry is proposed to extract aggregate in several phases over a period of 30 years. Phase 1 is located on the west portion of the site (west of Bessey Road) and extraction will begin in Phase 1A located at the north east corner, and will proceed west to the extraction boundary and then south to Phase 1B. Phase 1 covers 32 ha of the total extraction area of 51.2 ha with Phase 1A consisting of 17 ha that is scheduled to be extracted over a period of approximately 10 years. When Phase 1 is complete, extraction will begin in Phase 2, starting in Phase 2A to the south then moving northerly to Phase 2B. The phase limits and direction and depth of excavation are shown on the Operations Plan attached with this report.

The existing culvert at Bessey Road will be replaced with a 750 mm diameter culvert (or equivalent) to prevent overtopping of Bessey Road as flows are conveyed from Phase 1 to Phase 2 and on to the EMD. The culvert has a capacity of approximately 0.8 m³/s and will convey the flow from the 10-year storm event on the Phase 1 lands without overtopping the road. This replacement work would be completed in conjunction with the road widening that is to occur on Bessey Road to construct the entrances to the quarry.

As development of the quarry progresses through the defined phases, undisturbed areas will continue to drain overland to the EMD per existing conditions, whereas all runoff from the active portions of the quarry will be contained on site and discharged in a controlled manner as proposed.

The proposed strategy for water management is to construct a storage pond in the Phase 1B area that will be used to appropriately control and release water for the Phase 1A quarry operation. Once quarry operations evolve into Phase 1B and Phase 2 the existing quarried area (Phase 1A) will be used for storage when Phase 1 has been completely extracted and operations have proceeded to Phase 2, the entire Phase 1 area can be utilized for storage. The following sections summarize the technical analysis completed to assist in sizing the necessary storage volumes required for these development scenarios.

5 WATER MANAGEMENT PLAN

The following water management plan provides an actionable approach for control of water generated on site, considering the results of the analysis presented above.

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Quantity Control

As determined in the water balance analysis, a storage volume of 48,337 m³ is required for Phase 1A, based on the highest year in the last 40 years of recorded data. Also from the hydrologic modeling we have confirmed the volume of water that would be generated from the site during a 100 year storm event would be 11,924 m³, based on a rainfall depth of 70.14 mm. This volume represents a conservative buffer that could be incorporated into the pond design to allow for a freeboard should an extreme storm event happen during the peak storage time calculated. This results in a total storage volume of 60,300 m³ as required for the Phase 1A operation under normal groundwater flow conditions. To meet this requirement, a pond (or ponds) will be constructed to detain surface runoff from the site until it can be appropriately discharged. As a result, Pond 1 will be constructed at existing ground level prior to the commencement of Phase 1A and will be sized to provide water control for the 17 ha Phase 1A development. Future Phases can be serviced by a pond (or ponds) constructed in the quarry floor.

For Phase 1A, all runoff from the disturbed areas of the quarry will be routed overland and collected on site in an identified sump area. Flows to the sump area will be pumped to the pond where they will be detained until release is allowed as described in Section 2.3. We suggest that to start, the determination of whether discharge can occur could be set by using the monitoring device in the EMD at the downstream end of the site. From the data collected to date we suggest a water elevation of 175.15 at this location could be used as the initial trigger value for release. If water levels at this location are above 175.15 no discharge should occur. If water levels are below 175.15 discharge can occur as prescribed in Section 2.3. This value should be reviewed as more monitoring data is collected. The maximum pump rate from the site for Phase 1A is 7,000 L/min. This pump rate should also be reviewed as quarry operations proceed based on monitoring results.

For the Phase 2 development the storage can be provided in the Phase 1 quarry floor and the same water management strategy as it relates to discharge to the EMD should continue. The Phase 2 storage volume determined by the water balance analysis is 324,876 m³ and the 100-year volume generated on-site is 35,912 m³. The total storage required for the ultimate condition that results is 361,000 m³. We note that we would expect that the on-going monitoring will confirm that the discharge rates could be increased for the future phases to 7,000 L./min and 14,000 L/min for the various seasons which would reduce this total storage volume.

Quality Control

The storage pond will also serve as a settling pond to meet water quality control criteria for the site. The pond will provide an active storage volume sufficient to detain the runoff from the 25-mm storm from the fully developed site for a minimum of 24-hours, assuming 100% site imperviousness and a corresponding runoff depth of 25-mm. The required storage volume for Phase 1A is 4250 m³, based on the contributing area of 17 ha. Water quality storage volumes for all Phases are presented in Table 5.1 below:

Table 5.1
Water Quality Storage Volumes

Phase	Required Water Quality Storage Volume (m ³)
1A	4250
2	12,800

The volumes provided in the proposed pond more than adequately cover the volumes stipulated as being required in the above table.

6 CONCLUSIONS AND RECOMMENDATIONS

This water management plan has been conceived to address water quality and quantity control requirements for a proposed Reeb Quarry operation. Currently, runoff from the site drains to the Eagle Marsh Drain. As development of the quarry proceeds, undisturbed areas will continue to drain as per existing conditions, while all runoff from the active portions of the quarry will be contained on site and then released in a controlled manner. The quarry development has been phased, with the first Phase 1A of 17 ha to occur over the first 10 years of operation.

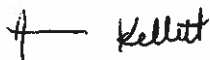
The capacity of the Eagle Marsh Drain, which was previously unknown, was assessed using the HEC-RAS hydraulic model. The limiting capacity of the drain was found to occur at the downstream end of the subject site, and corresponds approximately to the 2-year storm flow rate of 2.10 m³/s. The existing condition event based flow rates were determined using the OTTHYMO hydrologic model. Based on comparison of existing and proposed flows, it was found that a maximum release rate of 14,000 L/min (0.23 m³/s) would ensure that no adverse impact to the Drain would occur from the total release rate from the site under its ultimate development condition.

A water balance analysis was carried out to determine the required storage volume to contain surface water surplus and groundwater inflow to the site, based on allowable discharge timing. The calculated storage volume required for Phase 1A is 60,300 m³ which also includes an allowance to store the site runoff from the 1:100 year storm.

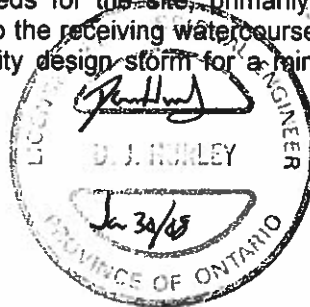
A storage pond is proposed to provide appropriate water quantity control for the Phase 1A site. In addition, the pond will serve to meet water quality control needs for the site, primarily through the reduction of suspended solids before discharging surface water to the receiving watercourse. The pond provides adequate storage to detain runoff from the water quality design storm for a minimum of 24-hours.

All of which is respectfully submitted,

C.C. TATHAM & ASSOCIATES LTD.



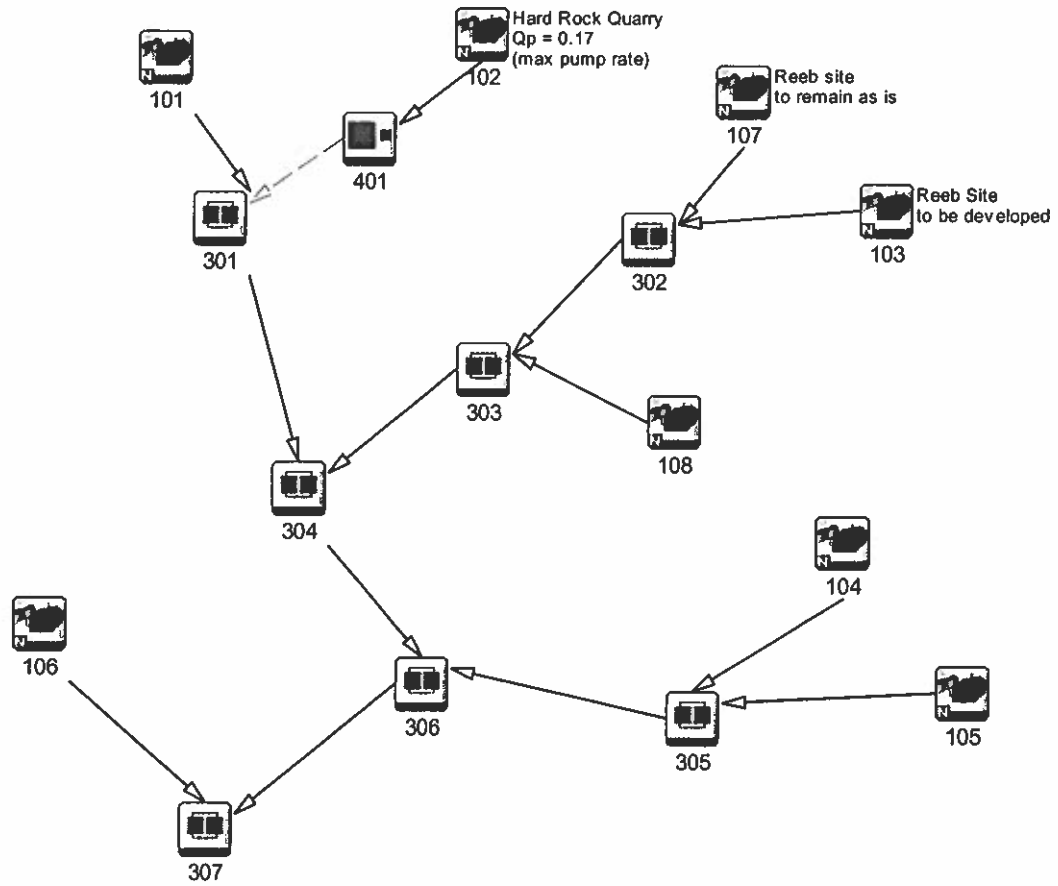
Amanda Kellett, B.Sc.Eng.
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Dan J. Hurley, P. Eng.

APPENDIX A: EXISTING CONDITIONS HYDROLOGIC MODEL

Existing Conditions OTTHYMO Model Schematic



REEB QUARRY
FILE No 104053

Area #. 101

Area = 343.00 ha

Weighted Curve Number																	
Soil Series Symbol	Hydrologic Soil Group	Soil Texture	Land Use		Forest/Woodland			Pasture/Lawn			Cultivated			Impervious			Average CN
			Area (ha)	Percent	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	
Wc	D	Clay	205.80	60.0%	51.45	25.0%	79.0	72.03	35.0%	84.0	72.03	35.0%	86.0	10.20	5.0%	98.0	84.2
Fl	B	Loam or Sil Loam	137.20	40.0%	34.30	25.0%	80.0	48.02	35.0%	69.0	48.02	35.0%	74.0	8.56	5.0%	98.0	70.0
			Avg. = 25.0%			Avg. = 35.0%			Avg. = 35.0%			Avg. = 5.0%					
Total Area =			343.00		Total Avg. = 190.0%						Avg. = 78.5						

Time of Concentration (Bransby-Williams Method)	
-suggested to use when runoff coefficient is greater than or equal to 0.40	
Path	Watercourse
Hmax (m)	189.2
Hmin (m)	176.2
L (m)	3180
Slope	0.4%
Time of conc.	120.91 min
Time of conc.	2.02 hrs
Time to peak	2/3 of tc
Time to peak	1.34 hours

Initial Abstraction	
Land Cover Values	
Impervious	2 mm
Pervious	
Lawns	5 mm
Pasture	8 mm
Forest	10 mm
Cultivated	7 mm
IA = (Forest x 10mm)+(Pasture x 8mm)+(Impervious x 2mm)+(Cultivated x 7mm)	
IA =	7.85 mm

Time of Concentration (SCS Upland Method)	
Path	Watercourse
Hmax (m)	189.2
Hmin (m)	176.2
L (m)	3180.0
Slope	0.4%
Velocity(m/s)	Woodland 0.10 Pasture 0.14 Impervious 0.39 Cultivated 0.18
Time of conc.	344.61 min
Time of conc.	5.74 hrs
Time to peak	2/3 of tc
Time to peak	3.83 hours

Time of Concentration (Airport Method)	
-suggested to use when runoff coefficient is less than 0.40	
Path	Watercourse
Hmax (m)	189.2
Hmin (m)	176.2
L (m)	3180.0
Slope	0.4%
	Clay
Pasture	0.10
Woodland	0.08
Impervious	0.40
Cultivated	0.22
Runoff Coefficient	0.18
Time of conc.	228.63 min
Time of conc.	3.81 hrs
Time to peak	2/3 of tc
Time to peak	2.54 hours

REEB QUARRY
FILE No 104053

Area #. 102

Area = 136.00 ha

Weighted Curve Number																		
Soil Series Symbol	Hydrologic Soil Group	Soil Texture	Land Use		Forest/Woodland			Lawn/Pasture			Bare Rock			Cultivated			Average	
			Area (ha)	Percent	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	CN	
FL	B	Loam or Silt Loam	108.80	80.0%	0.00	0.0%	60.0	0.00	0.0%	69.0	108.80	100.0%	98.0	0.00	0.0%	74.0	98.0	
Ws	D	Clay	27.20	20.0%	0.00	0.0%	79.0	0.00	0.0%	84.0	27.20	100.0%	98.0	0.00	0.0%	86.0	98.0	
			Avg. =		0.0%		Avg. =		0.0%		Avg. =		100.0%		Avg. =		0.0%	
Total Area =			136.00		Total Avg. =			100.0%						Avg. =			98.0	

Time of Concentration (Bransby-Williams Method)	
-suggested to use when runoff coefficient is greater than or equal to 0.40	
Path	Watercourse
Hmax (m)	189
Hmin (m)	176.2
L (m)	1800
Slope	0.7%
Time of conc.	67.21 min
Time of conc.	1.12 hrs
Time to peak	2/3 of tc
Time to peak	0.75 hours

Initial Abstraction	
Land Cover Values	
Impervious	2 mm
Pervious	
Lawns	5 mm
Pasture	8 mm
Forest	10 mm
Cultivated	7 mm
IA =	(Forest x 10mm)+(Pasture x 8mm)+(Impervious x 2mm)+(Cultivated x 7mm)
IA =	2.00 mm

Time of Concentration (SCS Upland Method)	
Path	Watercourse
Hmax (m)	189.0
Hmin (m)	176.2
L (m)	1800.0
Slope	0.7%
Velocity (m/s)	Woodland 0.13 Pasture 0.18 Impervious 0.52 Cultivated 0.23
Time of conc.	58.01 min
Time of conc.	0.97 hrs
Time to peak	2/3 of tc
Time to peak	0.64 hours

Time of Concentration (Airport Method)	
-suggested to use when runoff coefficient is less than 0.40	
Path	Watercourse
Hmax (m)	189.0
Hmin (m)	176.2
L (m)	1800.0
Slope	0.7%
	Loam or Silt
Pasture	0.10
Woodland	0.08
Impervious	0.40
Cultivated	0.22
Runoff Coefficient	0.32
Time of conc.	120.87 min
Time of conc.	2.01 hrs
Time to peak	2/3 of tc
Time to peak	1.34 hours

**REEB QUARRY
FILE No 104053**

Area #. 103

Area = 70.00 ha

Weighted Curve Number																		
Soil Series Symbol	Hydrologic Soil Group	Soil Texture	Land Use		Forest/Woodland			Pasture/Range			Impervious areas			Cultivated			Average	
			Area (ha)	Percent	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	CN	
Fl	B	Loam or Silt Loam	24.50	35.0%	6.13	25.0%	60.0	8.06	33.0%	69.0	0.49	2.0%	98.0	9.80	40.0%	74.0	69.3	
Wc	D	Clay	28.00	40.0%	7.00	25.0%	79.0	9.24	33.0%	84.0	0.56	2.0%	98.0	11.20	40.0%	86.0	83.8	
Je	D	Clay	17.50	25.0%	4.38	25.0%	79.0	5.78	33.0%	84.0	0.35	2.0%	98.0	7.00	40.0%	86.0	83.8	
			Avg =		25.0%		Avg =		33.0%		Avg =		2.0%		Avg =		40.0%	
Total Area =			52.50		Total Avg =			100.0%						Avg. =			78.8	

Time of Concentration (Bransby-Williams Method)	
-suggested to use when runoff coefficient is greater than or equal to 0.40	
Path	= Watercourse
Hmax (m)	= 184
Hmin (m)	= 175.5
L (m)	= 1180
Slope	= 0.7%
Time of conc.	= 47.35 min
Time of conc.	= 0.79 hrs
Time to peak	= 2/3 of tc
Time to peak	= 0.53 hours

Initial Abstraction	
Land Cover Values	
Impervious	= 2 mm
Pervious	
Lawns	5 mm
Pasture	8 mm
Forest	10 mm
Cultivated	7 mm
IA = (Forest x 10mm) + (Pasture x 8mm) + (Impervious x 2mm) + (Cultivated x 7mm)	
IA =	7.06 mm

Time of Concentration (SCS Upland Method)	
Path	= Watercourse
Hmax (m)	= 184.0
Hmin (m)	= 175.5
L (m)	= 1180.0
Slope	= 0.7%
Velocity (m/s)	Woodland 0.13 Pasture 0.16 Impervious 0.52 Cultivated 0.24
Time of conc.	= 97.46 min
Time of conc.	= 1.62 hrs
Time to peak	= 2/3 of tc
Time to peak	= 1.08 hours

Time of Concentration (Airport Method)	
-suggested to use when runoff coefficient is less than 0.40	
Path	= Watercourse
Hmax (m)	= 184.0
Hmin (m)	= 175.5
L (m)	= 1180.0
Slope	= 0.7%
Loam or Silt	
Pasture	0.10
Woodland	0.08
Impervious	0.40
Cultivated	0.22
Runoff Coefficient	= 0.05
Time of conc.	= 129.05 min
Time of conc.	= 2.15 hrs
Time to peak	= 2/3 of tc
Time to peak	= 1.43 hours

**REEB QUARRY
FILE No 104053**

Area #. 104

Area = 172.00 ha

Weighted Curve Number																	
Soil Series Symbol	Hydrologic Soil Group	Soil Texture	Land Use		Forest/Woodland			Pasture/Range			Impervious areas			Water/Wetland			Average CN
			Area (ha)	Percent	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	
Fl	B	Loam or Silt Loam	5.18	3.0%	1.55	30.0%	80.0	1.55	30.0%	89.0	0.26	5.0%	98.0	1.81	35.0%	50.0	61.1
Wc	D	Clay	34.40	20.0%	10.32	30.0%	79.0	10.32	30.0%	84.0	1.72	5.0%	98.0	12.04	35.0%	50.0	71.3
Jc	D	Clay	120.40	70.0%	36.12	30.0%	79.0	36.12	30.0%	84.0	6.02	5.0%	98.0	42.14	35.0%	50.0	71.3
Es	B	Sand Loam	12.04	7.0%	3.61	30.0%	80.0	3.61	30.0%	89.0	0.60	5.0%	98.0	4.21	35.0%	50.0	61.1
			Avg =		30.0%			Avg = 30.0%			Avg = 5.0%			Avg = 35.0%			
Total Area =			39.56		Total Avg. = 100.0%									Avg. = 70.3			

Time of Concentration (Bransby-Williams Method)	
-suggested to use when runoff coefficient is greater than or equal to 0.40	
Path	Watercourse
Hmax (m)	178.2
Hmin (m)	175
L (m)	2280
Slope	0.14%
Time of conc.	133.24 min
Time of conc.	2.22 hrs
Time to peak	2/3 of tc
Time to peak	1.48 hours

Initial Abstraction	
Land Cover Values	
Impervious	2 mm
Pervious	
Lawns	5 mm
Pasture	8 mm
Forest	10 mm
Cultivated	7 mm
IA = (Forest x 10mm)+(Pasture x 8mm)+(Impervious x 2mm)+(Cultivated x 7mm)	
IA =	7.95 mm

Time of Concentration (SCS Upland Method)	
Path	Watercourse
Hmax (m)	178.2
Hmin (m)	175.0
L (m)	2280.0
Slope	0.1%
Velocity(m/s)	Woodland 0.06 Pasture 0.06 Impervious 0.23 Cultivated 0.10
Time of conc.	427.11 min
Time of conc.	7.12 hrs
Time to peak	2/3 of tc
Time to peak	4.75 hours

Time of Concentration (Airport Method)	
-suggested to use when runoff coefficient is less than 0.40	
Path	Watercourse
Hmax (m)	178.2
Hmin (m)	175.0
L (m)	2280.0
Slope	0.1%
	Loam or Silt Loam
Pasture	0.10
Woodland	0.08
Impervious	0.40
Cultivated	0.22
Runoff Coefficient	0.00
Time of conc.	328.13 min
Time of conc.	5.47 hrs
Time to peak	2/3 of tc
Time to peak	3.65 hours

REEB QUARRY
FILE No 104053

Area #. 105

Area = 195.00 ha

Weighted Curve Number																				
Soil Series Symbol	Hydrologic Soil Group	Soil Texture	Land Use		Forest/Woodland			Pasture/Rangeland			Impervious areas			Cultivated			Water/Wetland			Average CN
			Area (ha)	Percent	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	
F1	B	Loam or Silty loam	156.00	80.0%	15.60	10.0%	60.0	31.20	20.0%	89.0	23.40	15.0%	98.0	31.20	20.0%	74.0	54.60	35.0%	60.0	68.8
Wc	D	Clay	15.60	8.0%	1.56	10.0%	79.0	3.12	20.0%	84.0	2.34	15.0%	98.0	3.12	20.0%	86.0	5.46	35.0%	60.0	74.1
Jc	D	Clay	23.40	12.0%	2.34	10.0%	79.0	4.68	20.0%	84.0	3.51	15.0%	98.0	4.68	20.0%	86.0	8.19	35.0%	60.0	74.1
			Avg. = 10.0%		Avg. = 20.0%			Avg. = 15.0%			Avg. = 20.0%			Avg. = 35.0%						
Total Area =			171.00		Total Avg. = 100.0%									Avg. = 68.3						

Time of Concentration (Bransby-Willems Method)	
-suggested to use when runoff coefficient is greater than or equal to 0.40	
Path	= Watercourse
Hmax (m)	= 182
Hmin (m)	= 175
L (m)	= 3360
Slope	= 0.2%
Time of conc.	= 158.68 min
Time of conc.	= 2.61 hrs
Time to peak	= 2/3 of tc
Time to peak	= 1.74 hours

Initial Abstraction	
Land Cover Values	
Impervious	= 2 mm
Pervious	
Lawns	= 5 mm
Pasture	= 8 mm
Forest	= 10 mm
Cultivated	= 7 mm
IA = (Forest x 10mm)+(Pasture x 8mm)+(Impervious x 2mm)+(Cultivated x 7mm)	
IA = 4.30 mm	

Time of Concentration (SCS Upland Method)	
Path	= Watercourse
Hmax (m)	= 182.0
Hmin (m)	= 175.0
L (m)	= 3360.0
Slope	= 0.2%
Velocity(m/s)	Woodland 0.07 Pasture 0.10 Impervious 0.28 Cultivated 0.13
Time of conc.	= 597.40 min
Time of conc.	= 9.96 hrs
Time to peak	= 2/3 of tc
Time to peak	= 6.64 hours

Time of Concentration (Airport Method)	
-suggested to use when runoff coefficient is less than 0.40	
Path	= Watercourse
Hmax (m)	= 182.0
Hmin (m)	= 175.0
L (m)	= 3360.0
Slope	= 0.2%
	Loam or Silty Loam
Pasture	= 0.10
Woodland	= 0.08
Impervious	= 0.40
Cultivated	= 0.22
Runoff Coefficient	= 0.11
Time of cor	= 316.98 min
Time of cor	= 5.28 hrs
Time to pes	= 2/3 of tc
Time to pes	= 3.52 hours

REEB QUARRY
FILE No 104053

Area #. 106

Area = 138.00 ha

Soil Series Symbol	Hydrologic Soil Group	Soil Texture	Land Use		Forest/Woodland			Pasture/Rangeland			Impervious areas			Cultivated			Water/Wetland			Average
			Area (ha)	Percent	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	CN
Fl	B	Loam or Sil Loam	6.00	6.0%	1.04	15.3%	60.0	1.73	25.0%	69.0	1.73	25.0%	98.0	1.38	20.0%	74.0	1.04	15.0%	50.0	73.1
Jc	D	Clay	119.40	80.0%	18.66	15.0%	70.0	27.60	25.0%	84.0	27.60	25.0%	98.0	22.08	20.0%	86.0	18.66	15.0%	50.0	82.1
Es	B	Sand Loam	20.70	15.0%	3.11	15.0%	80.0	5.18	25.0%	89.0	5.18	25.0%	98.0	4.14	20.0%	74.0	3.11	15.0%	50.0	73.1
			Avg. = 15.0%		Avg. = 25.0%			Avg. = 25.0%			Avg. = 20.0%			Avg. = 15.0%						
Total Area =			117.30		Total Avg. = 100.0%															Avg. = 80.3

Time of Concentration (Bransby-Williams Method)	
-suggested to use when runoff coefficient is greater than or equal to 0.40	
Path	= Watercourse
Hmax (m)	= 175
Hmin (m)	= 174.5
L (m)	= 860
Slope	= 0.1%
Time of conc.	= 53.77 min
Time of conc.	= 0.90 hrs
Time to peak	= 2/3 of tc
Time to peak	= 0.60 hours

Initial Abstraction	
Land Cover Values	
Impervious	= 2 mm
Pervious	
Lawns	= 5 mm
Pasture	= 8 mm
Forest	= 10 mm
Cultivated	= 7 mm
IA =	(Forest x 10mm)+(Pasture x 8mm)+(Impervious x 2mm)+(Cultivated x 7mm)
IA =	5.40 mm

Time of Concentration (SCS Upland Method)	
Path	= Watercourse
Hmax (m)	= 175.0
Hmin (m)	= 174.5
L (m)	= 860.0
Slope	= 0.1%
Velocity (m/s)	Woodland 0.04 Pasture 0.05 Impervious 0.15 Cultivated 0.07
Time of conc.	= 208.55 min
Time of conc.	= 3.48 hrs
Time to peak	= 2/3 of tc
Time to peak	= 2.32 hours

Time of Concentration (Airport Method)	
-suggested to use when runoff coefficient is less than 0.40	
Path	= Watercourse
Hmax (m)	= 175.0
Hmin (m)	= 174.5
L (m)	= 860.0
Slope	= 0.1%
	Loam or Sil Loam
	Pasture 0.10
	Woodland 0.08
	Impervious 0.40
	Cultivated 0.22
Runoff Coefficient	= 0.01
Time of cor	= 259.22 min
Time of cor	= 4.48 hrs
Time to peak	= 2/3 of tc
Time to peak	= 2.99 hours

REEB QUARRY
FILE No 104053

Area #. 107

Area = 26.80 ha

Weighted Curve Number																		
Soil Series Symbol	Hydrologic Soil Group	Soil Texture	Land Use		Water/Wetland			Pasture/Range			Impervious areas			Cultivated			Average	
			Area (ha)	Percent	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	CN	
Fi	B	Loam or Silty Loam	0.38	35.0%	2.35	25.0%	60.0	3.10	33.0%	69.0	0.28	3.0%	98.0	3.75	40.0%	74.0	70.3	
Wc	D	Clay	10.72	40.0%	2.68	25.0%	79.0	3.54	33.0%	84.0	0.32	3.0%	98.0	4.29	40.0%	86.0	84.8	
Jc	D	Clay	6.70	25.0%	1.68	25.0%	79.0	2.21	33.0%	84.0	0.20	3.0%	98.0	2.68	40.0%	86.0	84.8	
			Avg. =		25.0%		Avg. = 33.0%			Avg. = 3.0%			Avg. = 40.0%					
Total Area =			20.10		Total Avg. = 101.0%													Avg. = 79.7

Time of Concentration (Bransby-Williams Method)	
-suggested to use when runoff coefficient is greater than or equal to 0.40	
Path	= Watercourse
Hmax (m)	= 177
Hmin (m)	= 175.5
L (m)	= 675
Slope	= 0.2%
Time of conc.	= 38.50 min
Time of conc.	= 0.64 hrs
Time to peak	= 2/3 of tc
Time to peak	= 0.43 hours

Initial Abstraction	
Land Cover Values	
Impervious	= 2 mm
Pervious	
Lawns	5 mm
Pasture	8 mm
Wetland	16 mm
Cultivated	7 mm
IA = (Forest x 10mm)+(Pasture x 8mm)+(Impervious x 2mm)+(Cultivated x 7mm)	
IA =	9.50 mm

Time of Concentration (SCS Upland Method)	
Path	= Watercourse
Hmax (m)	= 177.0
Hmin (m)	= 175.5
L (m)	= 675.0
Slope	= 0.2%
Velocity(m/s)	
	Wetland 0.07 Pasture 0.10 Impervious 0.29 Cultivated 0.13
Time of conc.	= 100.35 min
Time of conc.	= 1.67 hrs
Time to peak	= 2/3 of tc
Time to peak	= 1.11 hours

Time of Concentration (Airport Method)	
-suggested to use when runoff coefficient is less than 0.40	
Path	= Watercourse
Hmax (m)	= 177.0
Hmin (m)	= 175.5
L (m)	= 675.0
Slope	= 0.2%
	Loam or Silt
	Loam 0.10
	Pasture 0.10
	Wetland 0.08
	Impervious 0.40
	Cultivated 0.22
Runoff Coefficient	= 0.05
Time of conc.	= 146.33 min
Time of conc.	= 2.44 hrs
Time to peak	= 2/3 of tc
Time to peak	= 1.63 hours

REEB QUARRY
FILE No 104053

Area #. 108

Area = 17.00 ha

Weighted Curve Number																		
Soil Series Symbol	Hydrologic Soil Group	Soil Texture Loam or Silt Loam	Land Use		Forest/Woodland			Pasture/Range			Impervious areas			Cultivated			Average	
			Area (ha)	Percent	Area	%	CN	Area	%	CN	Area	%	CN	Area	%	CN	CN	
Ff	B		5.95	35.0%	0.00	0.0%	60.0	1.19	20.0%	69.0	0.18	3.0%	98.0	4.58	77.0%	74.0	73.7	
Wc	D	Clay	6.80	40.0%	0.00	0.0%	79.0	1.38	20.0%	84.0	0.20	3.0%	98.0	5.24	77.0%	86.0	86.0	
Jc	D	Clay	4.25	25.0%	0.00	0.0%	79.0	0.85	20.0%	84.0	0.13	3.0%	98.0	3.27	77.0%	86.0	86.0	
			Avg. =		0.0%		Avg. = 20.0%			Avg. = 3.0%			Avg. = 77.0%					
Total Area =			12.75		Total Avg. = 100.0%													Avg. = 81.7

Time of Concentration (Bransby-Williams Method)	
-suggested to use when runoff coefficient is greater than or equal to 0.40	
Path	= Watercourse
Hmax (m)	= 183
Hmin (m)	= 180.5
L (m)	= 470
Slope	= 0.5%
Time of conc.	= 23.58 min
Time of conc.	= 0.39 hrs
Time to peak	= 2/3 of tc
Time to peak	= 0.26 hours

Initial Abstraction	
Land Cover Values	
Impervious	= 2 mm
Pervious	
Lawns	5 mm
Pasture	8 mm
Forest	10 mm
Cultivated	7 mm
IA = (Forest x 10mm)+(Pasture x 8mm)+(Impervious x 2mm)+(Cultivated x 7mm)	
IA =	7.05 mm

Time of Concentration (SCS Upland Method)	
Path	= Watercourse
Hmax (m)	= 183.0
Hmin (m)	= 180.5
L (m)	= 470.0
Slope	= 0.5%
Velocity(m/s)	Woodland 0.11 Pasture 0.18 Impervious 0.45 Cultivated 0.20
Time of conc.	= 39.19 min
Time of conc.	= 0.65 hrs
Time to peak	= 2/3 of tc
Time to peak	= 0.44 hours

Time of Concentration (Airport Method)	
-suggested to use when runoff coefficient is less than 0.40	
Path	= Watercourse
Hmax (m)	= 183.0
Hmin (m)	= 180.5
L (m)	= 470.0
Slope	= 0.5%
Loam or Silt	
Pasture	0.10
Woodland	0.08
Impervious	0.40
Cultivated	0.22
Runoff Coefficient	= 0.07
Time of conc.	= 89.80 min
Time of conc.	= 1.50 hrs
Time to peak	= 2/3 of tc
Time to peak	= 1.00 hours

=====

```
V  V  I  SSSSS  U  U  A  L
V  V  I  SS     U  U  A  A  L
V  V  I  SS     U  U  AAAAA  L
V  V  I  SS     U  U  A  A  L
VV   I  SSSSS  UUUUU  A  A  LLLLL
```

```
OOO  TTTT  TTTT  H  H  Y  Y  M  M  OOO  TM, Version 2.0
O  O  T  T  H  H  Y  Y  MM  MM  O  O
O  O  T  T  H  H  Y  M  M  O  O  Licensed To: C.C. Tatham &
Associates Ltd.
OOO  T  T  H  H  Y  M  M  OOO  V02-0110
```

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***** D E T A I L E D O U T P U T *****

```
Input filename: C:\Program Files\Visual OTTHYMO v2.0\voin.dat
Output filename: C:\My Documents\104053 Reeb Quarry\Reeb OTTHYMO\Pre-
development.out
Summary filename: C:\My Documents\104053 Reeb Quarry\Reeb OTTHYMO\Pre-
development.sum
```

DATE: 24/01/2008 TIME: 3:33:12 PM

USER:

COMMENTS: _____

```
*****
** SIMULATION NUMBER: 1 **
*****
```

```
-----
| READ STORM | Filename: C:\My Documents\STORMS\
| | Owen Sound\CHIC25MM.4HR
| Ptotal= 24.97 mm | Comments: 25 mm 4-hr Chicago storm
-----
```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.10	1.29	1.10	2.81	2.10	13.05	3.10	2.04
.20	1.36	1.20	3.22	2.20	8.44	3.20	1.89
.30	1.44	1.30	3.77	2.30	6.21	3.30	1.76
.40	1.53	1.40	4.55	2.40	4.91	3.40	1.65
.50	1.63	1.50	5.77	2.50	4.06	3.50	1.55
.60	1.75	1.60	7.86	2.60	3.47	3.60	1.46
.70	1.89	1.70	12.27	2.70	3.03	3.70	1.39
.80	2.06	1.80	26.17	2.80	2.70	3.80	1.32
.90	2.26	1.90	72.58	2.90	2.43	3.90	1.26
1.00	2.50	2.00	26.96	3.00	2.22	4.00	1.20

```
-----
| CALIB |
| NASHYD (0103) | Area (ha)= 70.00 Curve Number (CN)= 78.4
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res. (N)= 3.00
-----
U.H. Tp(hrs)= 1.43
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.083	1.29	1.083	2.81	2.083	13.05	3.08	2.04
.167	1.35	1.167	3.14	2.167	9.36	3.17	1.92
.250	1.41	1.250	3.55	2.250	7.10	3.25	1.81
.333	1.48	1.333	4.08	2.333	5.69	3.33	1.72
.417	1.55	1.417	4.79	2.417	4.74	3.42	1.63
.500	1.63	1.500	5.77	2.500	4.06	3.50	1.55
.583	1.75	1.583	7.86	2.583	3.47	3.58	1.46
.667	1.86	1.667	11.39	2.667	3.12	3.67	1.40
.750	1.99	1.750	20.61	2.750	2.83	3.75	1.35
.833	2.14	1.833	44.73	2.833	2.59	3.83	1.30
.917	2.31	1.917	63.46	2.917	2.39	3.92	1.25
1.000	2.50	2.000	26.96	3.000	2.22	4.00	1.20

Unit Hyd Qpeak (cms) = 1.870

PEAK FLOW (cms) = .204 (i)
 TIME TO PEAK (hrs) = 3.833
 RUNOFF VOLUME (mm) = 3.312
 TOTAL RAINFALL (mm) = 24.971
 RUNOFF COEFFICIENT = .133

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | CALIB |
 | NASHYD (0107) | Area (ha) = 26.80 Curve Number (CN) = 79.7
 | ID= 1 DT= 5.0 min | Ia (mm) = 9.50 # of Linear Res. (N) = 3.00

 U.H. Tp (hrs) = 1.63

Unit Hyd Qpeak (cms) = .628

PEAK FLOW (cms) = .064 (i)
 TIME TO PEAK (hrs) = 4.083
 RUNOFF VOLUME (mm) = 2.986
 TOTAL RAINFALL (mm) = 24.971
 RUNOFF COEFFICIENT = .120

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | ADD HYD (0302) |
 | 1 + 2 = 3 | AREA QPEAK TPEAK R.V.

 ID1= 1 (0103): 70.00 .204 3.83 3.31
 + ID2= 2 (0107): 26.80 .064 4.08 2.99

 ID = 3 (0302): 96.80 .267 3.83 3.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | CALIB |
 | NASHYD (0108) | Area (ha) = 17.00 Curve Number (CN) = 81.7
 | ID= 1 DT= 5.0 min | Ia (mm) = 8.00 # of Linear Res. (N) = 3.00

 U.H. Tp (hrs) = 1.00

Unit Hyd Qpeak (cms) = .649

PEAK FLOW (cms) = .076 (i)
 TIME TO PEAK (hrs) = 3.250

RUNOFF VOLUME (mm)= 3.899
 TOTAL RAINFALL (mm)= 24.971
 RUNOFF COEFFICIENT = .156

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0303) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0302):   96.80   .267    3.83    3.22
+ ID2= 2 (0108):  17.00   .076    3.25    3.90
=====
ID = 3 (0303):  113.80   .334    3.67    3.32
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0102) | Area (ha)= 136.00 Curve Number (CN)= 98.0
| ID= 1 DT= 5.0 min | Ia (mm)= 2.00 # of Linear Res. (N)= 3.00
-----
                U.H. Tp(hrs)= 1.34
  
```

Unit Hyd Qpeak (cms)= 3.877
 PEAK FLOW (cms)= 2.501 (i)
 TIME TO PEAK (hrs)= 3.333
 RUNOFF VOLUME (mm)= 18.742
 TOTAL RAINFALL (mm)= 24.971
 RUNOFF COEFFICIENT = .751

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| DUHYD (0401) |
| Inlet Cap.= .170 |
| #of Inlets= 1 |
| Total(cms)= .2 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
TOTAL HYD.(ID= 1): 136.00   2.50    3.33   18.74
=====
MAJOR SYS.(ID= 2): 115.39   2.33    3.33   18.74
MINOR SYS.(ID= 3):  20.61   .17     1.92   18.74
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0101) | Area (ha)= 343.00 Curve Number (CN)= 78.5
| ID= 1 DT= 5.0 min | Ia (mm)= 7.80 # of Linear Res. (N)= 3.00
-----
                U.H. Tp(hrs)= 2.54
  
```

Unit Hyd Qpeak (cms)= 5.158
 PEAK FLOW (cms)= .651 (i)
 TIME TO PEAK (hrs)= 4.917
 RUNOFF VOLUME (mm)= 3.399
 TOTAL RAINFALL (mm)= 24.971
 RUNOFF COEFFICIENT = .136

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0301) |
  
```

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0401):	20.61	.170	1.92	18.74
+ ID2= 2 (0101):	343.00	.651	4.92	3.40
=====				
ID = 3 (0301):	363.61	.821	4.92	4.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0303):	113.80	.334	3.67	3.32
+ ID2= 2 (0301):	363.61	.821	4.92	4.27
=====				
ID = 3 (0304):	477.41	1.089	4.50	4.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area (ha)	Curve Number (CN)
NASHYD (0105)	195.00	68.3
ID= 1 DT= 5.0 min	Ia (mm)= 4.30	# of Linear Res. (N)= 3.00
	U.H. Tp(hrs)= 3.52	

Unit Hyd Qpeak (cms)= 2.116

PEAK FLOW (cms)= .250 (i)
 TIME TO PEAK (hrs)= 5.833
 RUNOFF VOLUME (mm)= 3.084
 TOTAL RAINFALL (mm)= 24.971
 RUNOFF COEFFICIENT = .123

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)	Curve Number (CN)
NASHYD (0104)	172.00	70.3
ID= 1 DT= 5.0 min	Ia (mm)= 8.00	# of Linear Res. (N)= 3.00
	U.H. Tp(hrs)= 3.65	

Unit Hyd Qpeak (cms)= 1.800

PEAK FLOW (cms)= .160 (i)
 TIME TO PEAK (hrs)= 6.083
 RUNOFF VOLUME (mm)= 2.317
 TOTAL RAINFALL (mm)= 24.971
 RUNOFF COEFFICIENT = .093

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0105):	195.00	.250	5.83	3.08
+ ID2= 2 (0104):	172.00	.160	6.08	2.32
=====				
ID = 3 (0305):	367.00	.409	5.92	2.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD (0306) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0304):  477.41  1.089   4.50   4.04
+ ID2= 2 (0305):  367.00   .409   5.92   2.72
-----
ID = 3 (0306):  844.41  1.436   4.75   3.47

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0106) | Area (ha)= 138.00 Curve Number (CN)= 80.3
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
-----
                U.H. Tp(hrs)= 2.99

```

```

Unit Hyd Qpeak (cms)= 1.763

PEAK FLOW (cms)= .312 (i)
TIME TO PEAK (hrs)= 5.333
RUNOFF VOLUME (mm)= 4.678
TOTAL RAINFALL (mm)= 24.971
RUNOFF COEFFICIENT = .187

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0307) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0306):  844.41  1.436   4.75   3.47
+ ID2= 2 (0106):  138.00   .312   5.33   4.68
-----
ID = 3 (0307):  982.41  1.740   4.92   3.64

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION NUMBER: 2 **
*****

```

```

-----
| CHICAGO STORM | IDF curve parameters: A= 567.000
| Ptotal= 37.40 mm | B= 5.200
                    C= .746
                    used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.17	2.86	1.17	19.21	2.17	6.35	3.17	3.36
.33	3.25	1.33	74.46	2.33	5.47	3.33	3.14
.50	3.78	1.50	24.72	2.50	4.83	3.50	2.95
.67	4.57	1.67	13.71	2.67	4.33	3.67	2.78
.83	5.90	1.83	9.72	2.83	3.94	3.83	2.63
1.00	8.67	2.00	7.64	3.00	3.63	4.00	2.50

```

-----
| CALIB |
| NASHYD (0103) | Area (ha)= 70.00 Curve Number (CN)= 78.4
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00

```

U.H. Tp(hrs)= 1.43

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.083	2.86	1.083	19.21	2.083	6.35	3.08	3.36
.167	2.86	1.167	19.21	2.167	6.35	3.17	3.36
.250	3.25	1.250	74.46	2.250	5.47	3.25	3.14
.333	3.25	1.333	74.46	2.333	5.47	3.33	3.14
.417	3.78	1.417	24.72	2.417	4.83	3.42	2.95
.500	3.78	1.500	24.72	2.500	4.83	3.50	2.95
.583	4.57	1.583	13.71	2.583	4.33	3.58	2.78
.667	4.57	1.667	13.71	2.667	4.33	3.67	2.78
.750	5.90	1.750	9.72	2.750	3.94	3.75	2.63
.833	5.90	1.833	9.72	2.833	3.94	3.83	2.63
.917	8.67	1.917	7.64	2.917	3.63	3.92	2.50
1.000	8.67	2.000	7.64	3.000	3.63	4.00	2.50

Unit Hyd Qpeak (cms) = 1.870

PEAK FLOW (cms) = .473 (i)
TIME TO PEAK (hrs) = 3.500
RUNOFF VOLUME (mm) = 8.699
TOTAL RAINFALL (mm) = 37.402
RUNOFF COEFFICIENT = .233

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| CALIB |
| NASHYD (0107) | Area (ha) = 26.80 Curve Number (CN) = 79.7
| ID= 1 DT= 5.0 min | Ia (mm) = 9.50 # of Linear Res. (N) = 3.00

U.H. Tp(hrs) = 1.63

Unit Hyd Qpeak (cms) = .628

PEAK FLOW (cms) = .162 (i)
TIME TO PEAK (hrs) = 3.833
RUNOFF VOLUME (mm) = 8.408
TOTAL RAINFALL (mm) = 37.402
RUNOFF COEFFICIENT = .225

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0302) |
1 + 2 = 3
ID1= 1 (0103): AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
+ ID2= 2 (0107): 70.00 .473 3.50 8.70
26.80 .162 3.83 8.41
=====

ID = 3 (0302): 96.80 .632 3.58 8.62

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (0108) | Area (ha) = 17.00 Curve Number (CN) = 81.7
| ID= 1 DT= 5.0 min | Ia (mm) = 8.00 # of Linear Res. (N) = 3.00

U.H. Tp(hrs) = 1.00

Unit Hyd Qpeak (cms) = .649

PEAK FLOW (cms) = .165 (i)

TIME TO PEAK (hrs)= 2.750
 RUNOFF VOLUME (mm)= 10.018
 TOTAL RAINFALL (mm)= 37.402
 RUNOFF COEFFICIENT = .268

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0303) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0302):  96.80   .632   3.58   8.62
+ ID2= 2 (0108):  17.00   .165   2.75  10.02
=====
ID = 3 (0303):  113.80   .778   3.33   8.83
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0102) | Area (ha)= 136.00 Curve Number (CN)= 98.0
| ID= 1 DT= 5.0 min | Ia (mm)= 2.00 # of Linear Res. (N)= 3.00
-----
          U.H. Tp(hrs)= 1.34
  
```

Unit Hyd Qpeak (cms)= 3.877

PEAK FLOW (cms)= 3.710 (i)
 TIME TO PEAK (hrs)= 2.917
 RUNOFF VOLUME (mm)= 30.881
 TOTAL RAINFALL (mm)= 37.402
 RUNOFF COEFFICIENT = .826

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| DUHYD (0401) |
| Inlet Cap.= .170 |
| #of Inlets= 1 |
| Total (cms)= .2 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
TOTAL HYD. (ID= 1): 136.00   3.71   2.92  30.88
=====
MAJOR SYS. (ID= 2): 121.73   3.54   2.92  30.88
MINOR SYS. (ID= 3):  14.27   .17   1.33  30.88
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0101) | Area (ha)= 343.00 Curve Number (CN)= 78.5
| ID= 1 DT= 5.0 min | Ia (mm)= 7.80 # of Linear Res. (N)= 3.00
-----
          U.H. Tp(hrs)= 2.54
  
```

Unit Hyd Qpeak (cms)= 5.158

PEAK FLOW (cms)= 1.611 (i)
 TIME TO PEAK (hrs)= 4.750
 RUNOFF VOLUME (mm)= 8.836
 TOTAL RAINFALL (mm)= 37.402
 RUNOFF COEFFICIENT = .236

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

| ADD HYD (0301) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0401):  14.27   .170    1.33   30.88
+ ID2= 2 (0101): 343.00   1.611   4.75   8.84
-----
ID = 3 (0301):  357.27   1.781   4.75   9.72

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| ADD HYD (0304) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0303):  113.80   .778    3.33   8.83
+ ID2= 2 (0301): 357.27   1.781   4.75   9.72
-----
ID = 3 (0304):  471.07   2.423   4.33   9.50

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| CALIB |
| NASHYD (0105) | Area (ha)= 195.00 Curve Number (CN)= 68.3
| ID= 1 DT= 5.0 min | Ia (mm)= 4.30 # of Linear Res. (N)= 3.00
-----
U.H. Tp(hrs)= 3.52

```

Unit Hyd Qpeak (cms)= 2.116

PEAK FLOW (cms)= .572 (i)
TIME TO PEAK (hrs)= 5.667
RUNOFF VOLUME (mm)= 7.257
TOTAL RAINFALL (mm)= 37.402
RUNOFF COEFFICIENT = .194

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

| CALIB |
| NASHYD (0104) | Area (ha)= 172.00 Curve Number (CN)= 70.3
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res. (N)= 3.00
-----
U.H. Tp(hrs)= 3.65

```

Unit Hyd Qpeak (cms)= 1.800

PEAK FLOW (cms)= .425 (i)
TIME TO PEAK (hrs)= 5.833
RUNOFF VOLUME (mm)= 6.324
TOTAL RAINFALL (mm)= 37.402
RUNOFF COEFFICIENT = .169

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

| ADD HYD (0305) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0105):  195.00   .572    5.67   7.26
+ ID2= 2 (0104): 172.00   .425    5.83   6.32
-----
ID = 3 (0305):  367.00   .996    5.75   6.82

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.


```

-----
| ADD HYD (0306) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0304):  471.07  2.423   4.33    9.50
+ ID2= 2 (0305):  367.00   .996    5.75    6.82
-----
ID = 3 (0306):  838.07  3.289   4.58    8.33

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0106) | Area (ha)= 138.00 Curve Number (CN)= 80.3
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res. (N)= 3.00
-----
          U.H. Tp(hrs)= 2.99

```

```

Unit Hyd Qpeak (cms)= 1.763

PEAK FLOW (cms)= .698 (i)
TIME TO PEAK (hrs)= 5.083
RUNOFF VOLUME (mm)= 10.859
TOTAL RAINFALL (mm)= 37.402
RUNOFF COEFFICIENT = .290

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0307) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0306):  838.07  3.289   4.58    8.33
+ ID2= 2 (0106):  138.00   .698    5.08   10.86
-----
ID = 3 (0307):  976.07  3.972   4.67    8.69

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION NUMBER: 3 **
*****

```

```

-----
| CHICAGO STORM |
| Ptotal= 44.35 mm |
-----

```

```

IDF curve parameters: A= 664.000
                      B= 4.700
                      C= .744
used in: INTENSITY = A / (t + B)^C

```

```

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.17	3.39	1.17	22.42	2.17	7.48	3.17	3.98
.33	3.85	1.33	89.88	2.33	6.45	3.33	3.72
.50	4.48	1.50	28.86	2.50	5.70	3.50	3.50
.67	5.41	1.67	16.02	2.67	5.12	3.67	3.30
.83	6.96	1.83	11.39	2.83	4.67	3.83	3.13
1.00	10.17	2.00	8.98	3.00	4.29	4.00	2.98

```

-----
| CALIB |
| NASHYD (0103) | Area (ha)= 70.00 Curve Number (CN)= 78.4

```

|ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 1.43

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.083	3.39	1.083	22.42	2.083	7.48	3.08	3.98
.167	3.39	1.167	22.42	2.167	7.48	3.17	3.98
.250	3.85	1.250	89.88	2.250	6.45	3.25	3.72
.333	3.85	1.333	89.88	2.333	6.45	3.33	3.72
.417	4.48	1.417	28.86	2.417	5.70	3.42	3.50
.500	4.48	1.500	28.86	2.500	5.70	3.50	3.50
.583	5.41	1.583	16.02	2.583	5.12	3.58	3.30
.667	5.41	1.667	16.02	2.667	5.12	3.67	3.30
.750	6.96	1.750	11.39	2.750	4.67	3.75	3.13
.833	6.96	1.833	11.39	2.833	4.67	3.83	3.13
.917	10.17	1.917	8.98	2.917	4.29	3.92	2.98
1.000	10.17	2.000	8.98	3.000	4.29	4.00	2.98

Unit Hyd Qpeak (cms)= 1.870

PEAK FLOW (cms)= .681 (i)
 TIME TO PEAK (hrs)= 3.417
 RUNOFF VOLUME (mm)= 12.428
 TOTAL RAINFALL (mm)= 44.353
 RUNOFF COEFFICIENT = .280

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | CALIB |
 | NASHYD (0107) | Area (ha)= 26.80 Curve Number (CN)= 79.7
 |ID= 1 DT= 5.0 min | Ia (mm)= 9.50 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 1.63

Unit Hyd Qpeak (cms)= .628

PEAK FLOW (cms)= .235 (i)
 TIME TO PEAK (hrs)= 3.750
 RUNOFF VOLUME (mm)= 12.202
 TOTAL RAINFALL (mm)= 44.353
 RUNOFF COEFFICIENT = .275

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | ADD HYD (0302) |
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0103):	70.00	.681	3.42	12.43
+ ID2= 2 (0107):	26.80	.235	3.75	12.20
=====				
ID = 3 (0302):	96.80	.912	3.50	12.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | CALIB |
 | NASHYD (0108) | Area (ha)= 17.00 Curve Number (CN)= 81.7
 |ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 1.00

Unit Hyd Qpeak (cms)= .649

PEAK FLOW (cms) = .238 (i)
 TIME TO PEAK (hrs) = 2.750
 RUNOFF VOLUME (mm) = 14.172
 TOTAL RAINFALL (mm) = 44.353
 RUNOFF COEFFICIENT = .320

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0303) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
    ID1= 1 (0302):  96.80   .912   3.50   12.37
    + ID2= 2 (0108):  17.00   .238   2.75   14.17
    =====
    ID = 3 (0303):  113.80  1.121  3.33   12.64
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0102) | Area (ha) = 136.00 Curve Number (CN) = 98.0
| ID= 1 DT= 5.0 min | Ia (mm) = 2.00 # of Linear Res. (N) = 3.00
-----
                U.H. Tp(hrs) = 1.34
  
```

Unit Hyd Qpeak (cms) = 3.877

PEAK FLOW (cms) = 4.545 (i)
 TIME TO PEAK (hrs) = 2.833
 RUNOFF VOLUME (mm) = 37.735
 TOTAL RAINFALL (mm) = 44.353
 RUNOFF COEFFICIENT = .851

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| DUHYD (0401) |
| Inlet Cap. = .170 |
| #of Inlets = 1 |
| Total(cms) = .2 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
    TOTAL HYD. (ID= 1): 136.00   4.54   2.83   37.73
    =====
    MAJOR SYS. (ID= 2): 123.96   4.37   2.83   37.73
    MINOR SYS. (ID= 3):  12.04   .17   1.25   37.73
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0101) | Area (ha) = 343.00 Curve Number (CN) = 78.5
| ID= 1 DT= 5.0 min | Ia (mm) = 7.80 # of Linear Res. (N) = 3.00
-----
                U.H. Tp(hrs) = 2.54
  
```

Unit Hyd Qpeak (cms) = 5.158

PEAK FLOW (cms) = 2.295 (i)
 TIME TO PEAK (hrs) = 4.667
 RUNOFF VOLUME (mm) = 12.591
 TOTAL RAINFALL (mm) = 44.353
 RUNOFF COEFFICIENT = .284

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0301) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
      ID1= 1 (0401):  12.04   .170   1.25   37.73
      + ID2= 2 (0101): 343.00   2.295   4.67   12.59
      -----
      ID = 3 (0301):  355.04   2.465   4.67   13.44
-----

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD (0304) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
      ID1= 1 (0303):  113.80   1.121   3.33   12.64
      + ID2= 2 (0301): 355.04   2.465   4.67   13.44
      -----
      ID = 3 (0304):  468.84   3.380   4.25   13.25
-----

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| NASHYD (0105) | Area (ha)= 195.00 Curve Number (CN)= 68.3
| ID= 1 DT= 5.0 min | Ia (mm)= 4.30 # of Linear Res. (N)= 3.00
-----
          U.H. Tp(hrs)= 3.52

```

Unit Hyd Qpeak (cms)= 2.116

PEAK FLOW (cms)= .800 (i)
 TIME TO PEAK (hrs)= 5.583
 RUNOFF VOLUME (mm)= 10.157
 TOTAL RAINFALL (mm)= 44.353
 RUNOFF COEFFICIENT = .229

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB
| NASHYD (0104) | Area (ha)= 172.00 Curve Number (CN)= 70.3
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res. (N)= 3.00
-----
          U.H. Tp(hrs)= 3.65

```

Unit Hyd Qpeak (cms)= 1.800

PEAK FLOW (cms)= .619 (i)
 TIME TO PEAK (hrs)= 5.833
 RUNOFF VOLUME (mm)= 9.199
 TOTAL RAINFALL (mm)= 44.353
 RUNOFF COEFFICIENT = .207

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0305) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
      ID1= 1 (0105):  195.00   .800   5.58   10.16
      + ID2= 2 (0104): 172.00   .619   5.83   9.20
      -----
      ID = 3 (0305):  367.00   1.418   5.67   9.71
-----

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD (0306) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0304):  468.84  3.380   4.25   13.25
+ ID2= 2 (0305):  367.00  1.418   5.67   9.71
=====
ID = 3 (0306):  835.84  4.610   4.58   11.69

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0106) | Area (ha)= 138.00 Curve Number (CN)= 80.3
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
-----
                U.H. Tp(hrs)= 2.99

```

Unit Hyd Qpeak (cms)= 1.763

PEAK FLOW (cms)= .963 (i)
 TIME TO PEAK (hrs)= 5.083
 RUNOFF VOLUME (mm)= 14.984
 TOTAL RAINFALL (mm)= 44.353
 RUNOFF COEFFICIENT = .338

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0307) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0306):  835.84  4.610   4.58   11.69
+ ID2= 2 (0106):  138.00  .963    5.08   14.98
=====
ID = 3 (0307):  973.84  5.551   4.67   12.16

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION NUMBER: 4 **
*****

```

```

-----
| CHICAGO STORM | IDF curve parameters: A= 724.000
| Ptotal= 49.77 mm | B= 4.300
-----
                C= .739
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.17	3.86	1.17	24.81	2.17	8.40	3.17	4.52
.33	4.36	1.33	101.38	2.33	7.26	3.33	4.22
.50	5.07	1.50	31.86	2.50	6.43	3.50	3.97
.67	6.10	1.67	17.79	2.67	5.79	3.67	3.75
.83	7.82	1.83	12.71	2.83	5.28	3.83	3.56
1.00	11.37	2.00	10.06	3.00	4.86	4.00	3.39

```

-----
| CALIB |

```

| NASHYD (0103) | Area (ha)= 70.00 Curve Number (CN)= 78.4
 |ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 1.43

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.083	3.86	1.083	24.81	2.083	8.40	3.08	4.52
.167	3.86	1.167	24.81	2.167	8.40	3.17	4.52
.250	4.36	1.250	101.38	2.250	7.26	3.25	4.22
.333	4.36	1.333	101.38	2.333	7.26	3.33	4.22
.417	5.07	1.417	31.86	2.417	6.43	3.42	3.97
.500	5.07	1.500	31.86	2.500	6.43	3.50	3.97
.583	6.10	1.583	17.79	2.583	5.79	3.58	3.75
.667	6.10	1.667	17.79	2.667	5.79	3.67	3.75
.750	7.82	1.750	12.71	2.750	5.28	3.75	3.56
.833	7.82	1.833	12.71	2.833	5.28	3.83	3.56
.917	11.37	1.917	10.06	2.917	4.86	3.92	3.39
1.000	11.37	2.000	10.06	3.000	4.86	4.00	3.39

Unit Hyd Qpeak (cms)= 1.870

PEAK FLOW (cms)= .858 (i)
 TIME TO PEAK (hrs)= 3.333
 RUNOFF VOLUME (mm)= 15.612
 TOTAL RAINFALL (mm)= 49.769
 RUNOFF COEFFICIENT = .314

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | CALIB |
 | NASHYD (0107) | Area (ha)= 26.80 Curve Number (CN)= 79.7
 |ID= 1 DT= 5.0 min | Ia (mm)= 9.50 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 1.63

Unit Hyd Qpeak (cms)= .628

PEAK FLOW (cms)= .298 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 15.449
 TOTAL RAINFALL (mm)= 49.769
 RUNOFF COEFFICIENT = .310

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | ADD HYD (0302) |
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0103):	70.00	.858	3.33	15.61
+ ID2= 2 (0107):	26.80	.298	3.67	15.45
=====				
ID = 3 (0302):	96.80	1.152	3.42	15.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | CALIB |
 | NASHYD (0108) | Area (ha)= 17.00 Curve Number (CN)= 81.7
 |ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
 ----- U.H. Tp(hrs)= 1.00

Unit Hyd Qpeak (cms)= .649

PEAK FLOW (cms)= .299 (i)
 TIME TO PEAK (hrs)= 2.667
 RUNOFF VOLUME (mm)= 17.683
 TOTAL RAINFALL (mm)= 49.769
 RUNOFF COEFFICIENT = .355

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0303) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0302):  96.80  1.152  3.42   15.57
+ ID2= 2 (0108):  17.00  .299   2.67   17.68
=====
ID = 3 (0303):  113.80  1.414  3.25   15.88
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0102) | Area (ha)= 136.00 Curve Number (CN)= 98.0
| ID= 1 DT= 5.0 min | Ia (mm)= 2.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.34
  
```

Unit Hyd Qpeak (cms)= 3.877

PEAK FLOW (cms)= 5.186 (i)
 TIME TO PEAK (hrs)= 2.833
 RUNOFF VOLUME (mm)= 43.093
 TOTAL RAINFALL (mm)= 49.769
 RUNOFF COEFFICIENT = .866

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| DUHYD (0401) |
| Inlet Cap.= .170 |
| #of Inlets= 1 |
| Total(cms)= .2 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
TOTAL HYD. (ID= 1): 136.00  5.19   2.83   43.09
=====
MAJOR SYS. (ID= 2): 125.23  5.02   2.83   43.09
MINOR SYS. (ID= 3):  10.77  .17    1.25   43.09
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0101) | Area (ha)= 343.00 Curve Number (CN)= 78.5
| ID= 1 DT= 5.0 min | Ia (mm)= 7.80 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 2.54
  
```

Unit Hyd Qpeak (cms)= 5.158

PEAK FLOW (cms)= 2.878 (i)
 TIME TO PEAK (hrs)= 4.667
 RUNOFF VOLUME (mm)= 15.792
 TOTAL RAINFALL (mm)= 49.769
 RUNOFF COEFFICIENT = .317

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0301) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0401):  10.77   .170    1.25   43.09
+ ID2= 2 (0101): 343.00   2.878   4.67   15.79
-----
ID = 3 (0301):  353.77   3.048   4.67   16.62

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD (0304) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0303):  113.80   1.414   3.25   15.88
+ ID2= 2 (0301): 353.77   3.048   4.67   16.62
-----
ID = 3 (0304):  467.57   4.196   4.25   16.44

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| NASHYD (0105) | Area (ha)= 195.00 Curve Number (CN)= 68.3
|ID= 1 DT= 5.0 min | Ia (mm)= 4.30 # of Linear Res. (N)= 3.00
-----
U.H. Tp(hrs)= 3.52

```

Unit Hyd Qpeak (cms)= 2.116

PEAK FLOW (cms)= .997 (i)
 TIME TO PEAK (hrs)= 5.583
 RUNOFF VOLUME (mm)= 12.656
 TOTAL RAINFALL (mm)= 49.769
 RUNOFF COEFFICIENT = .254

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB
| NASHYD (0104) | Area (ha)= 172.00 Curve Number (CN)= 70.3
|ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res. (N)= 3.00
-----
U.H. Tp(hrs)= 3.65

```

Unit Hyd Qpeak (cms)= 1.800

PEAK FLOW (cms)= .787 (i)
 TIME TO PEAK (hrs)= 5.750
 RUNOFF VOLUME (mm)= 11.703
 TOTAL RAINFALL (mm)= 49.769
 RUNOFF COEFFICIENT = .235

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0305) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0105):  195.00   .997    5.58   12.66
+ ID2= 2 (0104): 172.00   .787    5.75   11.70
-----
ID = 3 (0305):  367.00   1.783   5.67   12.21

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.


```

-----
| ADD HYD (0306) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0304):  467.57  4.196  4.25   16.44
+ ID2= 2 (0305):  367.00  1.783  5.67   12.21
=====
ID = 3 (0306):  834.57  5.738  4.58   14.58

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0106) | Area (ha)= 138.00 Curve Number (CN)= 80.3
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
-----
                U.H. Tp(hrs)= 2.99

```

```

Unit Hyd Qpeak (cms)= 1.763

PEAK FLOW (cms)= 1.186 (i)
TIME TO PEAK (hrs)= 5.083
RUNOFF VOLUME (mm)= 18.453
TOTAL RAINFALL (mm)= 49.769
RUNOFF COEFFICIENT = .371

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0307) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0306):  834.57  5.738  4.58   14.58
+ ID2= 2 (0106):  138.00  1.186  5.08   18.45
=====
ID = 3 (0307):  972.57  6.898  4.67   15.13

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION NUMBER: 5 **
*****

```

```

-----
| CHICAGO STORM | IDF curve parameters: A= 821.000
| Ptotal= 57.74 mm | B= 4.000
-----
                C= .735
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.17	4.52	1.17	28.47	2.17	9.76	3.17	5.28
.33	5.11	1.33	118.02	2.33	8.45	3.33	4.94
.50	5.92	1.50	36.50	2.50	7.49	3.50	4.65
.67	7.12	1.67	20.47	2.67	6.75	3.67	4.40
.83	9.10	1.83	14.70	2.83	6.17	3.83	4.17
1.00	13.16	2.00	11.66	3.00	5.69	4.00	3.97

```

| CALIB |
| NASHYD (0103) | Area (ha)= 70.00 Curve Number (CN)= 78.4
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 1.43

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
.083 4.52 | 1.083 28.47 | 2.083 9.76 | 3.08 5.28
.167 4.52 | 1.167 28.47 | 2.167 9.76 | 3.17 5.28
.250 5.11 | 1.250 118.02 | 2.250 8.45 | 3.25 4.94
.333 5.11 | 1.333 118.02 | 2.333 8.45 | 3.33 4.94
.417 5.92 | 1.417 36.50 | 2.417 7.49 | 3.42 4.65
.500 5.92 | 1.500 36.50 | 2.500 7.49 | 3.50 4.65
.583 7.12 | 1.583 20.47 | 2.583 6.75 | 3.58 4.40
.667 7.12 | 1.667 20.47 | 2.667 6.75 | 3.67 4.40
.750 9.10 | 1.750 14.70 | 2.750 6.17 | 3.75 4.17
.833 9.10 | 1.833 14.70 | 2.833 6.17 | 3.83 4.17
.917 13.16 | 1.917 11.66 | 2.917 5.69 | 3.92 3.97
1.000 13.16 | 2.000 11.66 | 3.000 5.69 | 4.00 3.97

```

Unit Hyd Qpeak (cms)= 1.870

```

PEAK FLOW (cms)= 1.141 (i)
TIME TO PEAK (hrs)= 3.333
RUNOFF VOLUME (mm)= 20.668
TOTAL RAINFALL (mm)= 57.745
RUNOFF COEFFICIENT = .358

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0107) | Area (ha)= 26.80 Curve Number (CN)= 79.7
| ID= 1 DT= 5.0 min | Ia (mm)= 9.50 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 1.63

```

Unit Hyd Qpeak (cms)= .628

```

PEAK FLOW (cms)= .399 (i)
TIME TO PEAK (hrs)= 3.667
RUNOFF VOLUME (mm)= 20.609
TOTAL RAINFALL (mm)= 57.745
RUNOFF COEFFICIENT = .357

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0302) |
| 1 + 2 = 3 | AREA QPEAK TPEAK R.V.
| | (ha) (cms) (hrs) (mm)
-----
ID1= 1 (0103): 70.00 1.141 3.33 20.67
+ ID2= 2 (0107): 26.80 .399 3.67 20.61
=====
ID = 3 (0302): 96.80 1.534 3.42 20.65

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0108) | Area (ha)= 17.00 Curve Number (CN)= 81.7
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 1.00

```

Unit Hyd Qpeak (cms)= .649
 PEAK FLOW (cms)= .397 (i)
 TIME TO PEAK (hrs)= 2.667
 RUNOFF VOLUME (mm)= 23.205
 TOTAL RAINFALL (mm)= 57.745
 RUNOFF COEFFICIENT = .402

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0303) |
| 1 + 2 = 3 |
-----
| AREA QPEAK TPEAK R.V. |
| (ha) (cms) (hrs) (mm) |
| ID1= 1 (0302): 96.80 1.534 3.42 20.65 |
| + ID2= 2 (0108): 17.00 .397 2.67 23.20 |
|=====|
| ID = 3 (0303): 113.80 1.882 3.25 21.03 |
-----

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0102) | Area (ha)= 136.00 Curve Number (CN)= 98.0
| ID= 1 DT= 5.0 min | Ia (mm)= 2.00 # of Linear Res. (N)= 3.00
|=====|
| U.H. Tp(hrs)= 1.34 |
-----

```

Unit Hyd Qpeak (cms)= 3.877
 PEAK FLOW (cms)= 6.136 (i)
 TIME TO PEAK (hrs)= 2.833
 RUNOFF VOLUME (mm)= 51.002
 TOTAL RAINFALL (mm)= 57.745
 RUNOFF COEFFICIENT = .883

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| DUHYD (0401) |
| Inlet Cap.= .170 |
| #of Inlets= 1 |
| Total(cms)= .2 |
|=====|
| AREA QPEAK TPEAK R.V. |
| (ha) (cms) (hrs) (mm) |
| TOTAL HYD. (ID= 1): 136.00 6.14 2.83 51.00 |
|=====|
| MAJOR SYS. (ID= 2): 126.65 5.97 2.83 51.00 |
| MINOR SYS. (ID= 3): 9.35 .17 1.17 51.00 |
-----

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0101) | Area (ha)= 343.00 Curve Number (CN)= 78.5
| ID= 1 DT= 5.0 min | Ia (mm)= 7.80 # of Linear Res. (N)= 3.00
|=====|
| U.H. Tp(hrs)= 2.54 |
-----

```

Unit Hyd Qpeak (cms)= 5.158
 PEAK FLOW (cms)= 3.804 (i)
 TIME TO PEAK (hrs)= 4.667
 RUNOFF VOLUME (mm)= 20.872
 TOTAL RAINFALL (mm)= 57.745
 RUNOFF COEFFICIENT = .361

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0301) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0401):   9.35   .170   1.17   51.00
+ ID2= 2 (0101): 343.00  3.804  4.67   20.87
=====
ID = 3 (0301):  352.35  3.974  4.67   21.67

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD (0304) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0303):  113.80  1.882  3.25   21.03
+ ID2= 2 (0301): 352.35  3.974  4.67   21.67
=====
ID = 3 (0304):  466.15  5.491  4.17   21.52

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0105) | Area (ha)= 195.00 Curve Number (CN)= 68.3
| ID= 1 DT= 5.0 min | Ia (mm)= 4.30 # of Linear Res.(N)= 3.00
-----
                U.H. Tp(hrs)= 3.52

```

Unit Hyd Qpeak (cms)= 2.116

PEAK FLOW (cms)= 1.313 (i)
 TIME TO PEAK (hrs)= 5.583
 RUNOFF VOLUME (mm)= 16.671
 TOTAL RAINFALL (mm)= 57.745
 RUNOFF COEFFICIENT = .289

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0104) | Area (ha)= 172.00 Curve Number (CN)= 70.3
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
-----
                U.H. Tp(hrs)= 3.65

```

Unit Hyd Qpeak (cms)= 1.800

PEAK FLOW (cms)= 1.060 (i)
 TIME TO PEAK (hrs)= 5.750
 RUNOFF VOLUME (mm)= 15.756
 TOTAL RAINFALL (mm)= 57.745
 RUNOFF COEFFICIENT = .273

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0305) |
| 1 + 2 = 3 |
-----
                AREA   QPEAK   TPEAK   R.V.
                (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0105):  195.00  1.313  5.58   16.67
+ ID2= 2 (0104): 172.00  1.060  5.75   15.76
=====
ID = 3 (0305):  367.00  2.371  5.67   16.24

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----  
| ADD HYD (0306) |  
| 1 + 2 = 3 |  
-----  
                AREA   QPEAK   TPEAK   R.V.  
                (ha)   (cms)   (hrs)   (mm)  
ID1= 1 (0304):  466.15  5.491   4.17   21.52  
+ ID2= 2 (0305):  367.00  2.371   5.67   16.24  
=====
```

```
ID = 3 (0306):  833.15  7.539   4.50   19.19
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----  
| CALIB |  
| NASHYD (0106) | Area (ha)= 138.00 Curve Number (CN)= 80.3  
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res. (N)= 3.00  
-----  
U.H. Tp(hrs)= 2.99
```

Unit Hyd Qpeak (cms)= 1.763

PEAK FLOW (cms)= 1.536 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 23.897
TOTAL RAINFALL (mm)= 57.745
RUNOFF COEFFICIENT = .414

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----  
| ADD HYD (0307) |  
| 1 + 2 = 3 |  
-----  
                AREA   QPEAK   TPEAK   R.V.  
                (ha)   (cms)   (hrs)   (mm)  
ID1= 1 (0306):  833.15  7.539   4.50   19.19  
+ ID2= 2 (0106):  138.00  1.536   5.00   23.90  
=====
```

```
ID = 3 (0307):  971.15  9.040   4.58   19.86
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
*****  
** SIMULATION NUMBER: 6 **  
*****
```

```
-----  
| CHICAGO STORM | IDF curve parameters: A= 900.000  
| Ptotal= 63.69 mm | B= 3.800  
-----  
C= .734  
used in: INTENSITY = A / (t + B)^C  
  
Duration of storm = 4.00 hrs  
Storm time step = 10.00 min  
Time to peak ratio = .33
```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.17	4.99	1.17	31.17	2.17	10.74	3.17	5.83
.33	5.64	1.33	131.09	2.33	9.31	3.33	5.46
.50	6.53	1.50	39.93	2.50	8.26	3.50	5.13
.67	7.84	1.67	22.44	2.67	7.45	3.67	4.85
.83	10.01	1.83	16.13	2.83	6.80	3.83	4.61
1.00	14.46	2.00	12.81	3.00	6.27	4.00	4.39

```

-----
| CALIB |
| NASHYD (0103) | Area (ha)= 70.00 Curve Number (CN)= 78.4
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 1.43

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
.083 4.99 | 1.083 31.17 | 2.083 10.74 | 3.08 5.83
.167 4.99 | 1.167 31.17 | 2.167 10.74 | 3.17 5.83
.250 5.64 | 1.250 131.09 | 2.250 9.31 | 3.25 5.46
.333 5.64 | 1.333 131.09 | 2.333 9.31 | 3.33 5.46
.417 6.53 | 1.417 39.93 | 2.417 8.26 | 3.42 5.13
.500 6.53 | 1.500 39.93 | 2.500 8.26 | 3.50 5.13
.583 7.84 | 1.583 22.44 | 2.583 7.45 | 3.58 4.85
.667 7.84 | 1.667 22.44 | 2.667 7.45 | 3.67 4.85
.750 10.01 | 1.750 16.13 | 2.750 6.80 | 3.75 4.61
.833 10.01 | 1.833 16.13 | 2.833 6.80 | 3.83 4.61
.917 14.46 | 1.917 12.81 | 2.917 6.27 | 3.92 4.39
1.000 14.46 | 2.000 12.81 | 3.000 6.27 | 4.00 4.39

```

Unit Hyd Qpeak (cms)= 1.870

PEAK FLOW (cms)= 1.368 (i)
 TIME TO PEAK (hrs)= 3.250
 RUNOFF VOLUME (mm)= 24.678
 TOTAL RAINFALL (mm)= 63.688
 RUNOFF COEFFICIENT = .387

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0107) | Area (ha)= 26.80 Curve Number (CN)= 79.7
| ID= 1 DT= 5.0 min | Ia (mm)= 9.50 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 1.63

```

Unit Hyd Qpeak (cms)= .628

PEAK FLOW (cms)= .480 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 24.699
 TOTAL RAINFALL (mm)= 63.688
 RUNOFF COEFFICIENT = .388

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0302) |
| 1 + 2 = 3 |
-----
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0103): 70.00 1.368 3.25 24.68
+ ID2= 2 (0107): 26.80 .480 3.58 24.70
=====
ID = 3 (0302): 96.80 1.841 3.33 24.68

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0108) | Area (ha)= 17.00 Curve Number (CN)= 81.7
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
-----
U.H. Tp(hrs)= 1.00

```

Unit Hyd Qpeak (cms)= .649

PEAK FLOW (cms)= .474 (i)
 TIME TO PEAK (hrs)= 2.667
 RUNOFF VOLUME (mm)= 27.546
 TOTAL RAINFALL (mm)= 63.688
 RUNOFF COEFFICIENT = .433

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0303) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0302):  96.80  1.841   3.33   24.68
+ ID2= 2 (0108):  17.00  .474    2.67   27.55
-----
          ID = 3 (0303):  113.80  2.257   3.17   25.11
-----
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0102) | Area (ha)= 136.00 Curve Number (CN)= 98.0
| ID= 1 DT= 5.0 min | Ia (mm)= 2.00 # of Linear Res.(N)= 3.00
-----
          U.H. Tp(hrs)= 1.34
  
```

Unit Hyd Qpeak (cms)= 3.877

PEAK FLOW (cms)= 6.851 (i)
 TIME TO PEAK (hrs)= 2.833
 RUNOFF VOLUME (mm)= 56.906
 TOTAL RAINFALL (mm)= 63.688
 RUNOFF COEFFICIENT = .894

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| DUHYD (0401) |
| Inlet Cap.= .170 |
| #of Inlets= 1 |
| Total(cms)= .2 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
TOTAL HYD.(ID= 1):  136.00  6.85   2.83   56.91
-----
MAJOR SYS.(ID= 2):  127.48  6.68   2.83   56.91
MINOR SYS.(ID= 3):   8.52  .17    1.17   56.91
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0101) | Area (ha)= 343.00 Curve Number (CN)= 78.5
| ID= 1 DT= 5.0 min | Ia (mm)= 7.80 # of Linear Res.(N)= 3.00
-----
          U.H. Tp(hrs)= 2.54
  
```

Unit Hyd Qpeak (cms)= 5.158

PEAK FLOW (cms)= 4.539 (i)
 TIME TO PEAK (hrs)= 4.667
 RUNOFF VOLUME (mm)= 24.897
 TOTAL RAINFALL (mm)= 63.688
 RUNOFF COEFFICIENT = .391

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0301) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0401):   8.52   .170   1.17   56.91
+ ID2= 2 (0101): 343.00  4.539   4.67   24.90
-----
ID = 3 (0301):  351.52  4.709   4.67   25.67

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD (0304) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0303):  113.80  2.257   3.17   25.11
+ ID2= 2 (0301): 351.52  4.709   4.67   25.67
-----
ID = 3 (0304):  465.32  6.520   4.17   25.54

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB
| NASHYD (0105) | Area (ha)= 195.00 Curve Number (CN)= 68.3
| ID= 1 DT= 5.0 min | Ia (mm)= 4.30 # of Linear Res. (N)= 3.00
-----
          U.H. Tp(hrs)= 3.52

```

Unit Hyd Qpeak (cms)= 2.116

PEAK FLOW (cms)= 1.567 (i)
 TIME TO PEAK (hrs)= 5.583
 RUNOFF VOLUME (mm)= 19.895
 TOTAL RAINFALL (mm)= 63.688
 RUNOFF COEFFICIENT = .312

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB
| NASHYD (0104) | Area (ha)= 172.00 Curve Number (CN)= 70.3
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res. (N)= 3.00
-----
          U.H. Tp(hrs)= 3.65

```

Unit Hyd Qpeak (cms)= 1.800

PEAK FLOW (cms)= 1.280 (i)
 TIME TO PEAK (hrs)= 5.750
 RUNOFF VOLUME (mm)= 19.026
 TOTAL RAINFALL (mm)= 63.688
 RUNOFF COEFFICIENT = .299

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0305) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0105):  195.00  1.567   5.58   19.90
+ ID2= 2 (0104): 172.00  1.280   5.75   19.03
-----
ID = 3 (0305):  367.00  2.845   5.67   19.49

```


NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| ADD HYD (0306) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0304): 465.32  6.520   4.17   25.54
+ ID2= 2 (0305): 367.00  2.845   5.67   19.49
=====
ID = 3 (0306): 832.32  8.973   4.50   22.87

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| NASHYD (0106) | Area (ha)= 138.00 Curve Number (CN)= 80.3
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res.(N)= 3.00
-----
          U.H. Tp(hrs)= 2.99

```

```

Unit Hyd Qpeak (cms)= 1.763

PEAK FLOW (cms)= 1.811 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 28.171
TOTAL RAINFALL (mm)= 63.688
RUNOFF COEFFICIENT = .442

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| ADD HYD (0307) |
| 1 + 2 = 3 |
-----
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 (0306): 832.32  8.973   4.50   22.87
+ ID2= 2 (0106): 138.00  1.811   5.00   28.17
=====
ID = 3 (0307): 970.32  10.743  4.58   23.62

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

*****
** SIMULATION NUMBER: 7 **
*****

```

```

-----
| CHICAGO STORM |
| Ptotal= 70.14 mm |
-----

```

```

IDF curve parameters: A= 980.000
                      B= 3.700
                      C= .732
used in: INTENSITY = A / (t + B)^C

```

```

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.17	5.52	1.17	34.19	2.17	11.85	3.17	6.45
.33	6.24	1.33	144.26	2.33	10.28	3.33	6.04
.50	7.22	1.50	43.76	2.50	9.12	3.50	5.68
.67	8.67	1.67	24.65	2.67	8.23	3.67	5.37
.83	11.05	1.83	17.76	2.83	7.52	3.83	5.10
1.00	15.93	2.00	14.12	3.00	6.94	4.00	4.86

 | CALIB |
 | NASHYD (0103) |
ID= 1 DT= 5.0 min

Area (ha)= 70.00 Curve Number (CN)= 78.4
 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 1.43

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.083	5.52	1.083	34.19	2.083	11.85	3.08	6.45
.167	5.52	1.167	34.19	2.167	11.85	3.17	6.45
.250	6.24	1.250	144.26	2.250	10.28	3.25	6.04
.333	6.24	1.333	144.26	2.333	10.28	3.33	6.04
.417	7.22	1.417	43.76	2.417	9.12	3.42	5.68
.500	7.22	1.500	43.76	2.500	9.12	3.50	5.68
.583	8.67	1.583	24.65	2.583	8.23	3.58	5.37
.667	8.67	1.667	24.65	2.667	8.23	3.67	5.37
.750	11.05	1.750	17.76	2.750	7.52	3.75	5.10
.833	11.05	1.833	17.76	2.833	7.52	3.83	5.10
.917	15.93	1.917	14.12	2.917	6.94	3.92	4.86
1.000	15.93	2.000	14.12	3.000	6.94	4.00	4.86

Unit Hyd Qpeak (cms)= 1.870

PEAK FLOW (cms)= 1.625 (i)
 TIME TO PEAK (hrs)= 3.250
 RUNOFF VOLUME (mm)= 29.224
 TOTAL RAINFALL (mm)= 70.137
 RUNOFF COEFFICIENT = .417

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | CALIB |
 | NASHYD (0107) |
ID= 1 DT= 5.0 min

Area (ha)= 26.80 Curve Number (CN)= 79.7
 Ia (mm)= 9.50 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 1.63

Unit Hyd Qpeak (cms)= .628

PEAK FLOW (cms)= .571 (i)
 TIME TO PEAK (hrs)= 3.583
 RUNOFF VOLUME (mm)= 29.337
 TOTAL RAINFALL (mm)= 70.137
 RUNOFF COEFFICIENT = .418

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 | ADD HYD (0302) |
1 + 2 = 3

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0103):	70.00	1.625	3.25	29.22
+ ID2= 2 (0107):	26.80	.571	3.58	29.34
=====				
ID = 3 (0302):	96.80	2.188	3.33	29.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | CALIB |
 | NASHYD (0108) |
ID= 1 DT= 5.0 min

Area (ha)= 17.00 Curve Number (CN)= 81.7
 Ia (mm)= 8.00 # of Linear Res.(N)= 3.00

----- U.H. Tp(hrs)= 1.00

Unit Hyd Qpeak (cms)= .649
PEAK FLOW (cms)= .562 (i)
TIME TO PEAK (hrs)= 2.583
RUNOFF VOLUME (mm)= 32.437
TOTAL RAINFALL (mm)= 70.137
RUNOFF COEFFICIENT = .462

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0303) |
1 + 2 = 3
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
ID1= 1 (0302): 96.80 2.188 3.33 29.26
+ ID2= 2 (0108): 17.00 .562 2.58 32.44
=====

ID = 3 (0303): 113.80 2.681 3.17 29.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (0102) | Area (ha)= 136.00 Curve Number (CN)= 98.0
| ID= 1 DT= 5.0 min | Ia (mm)= 2.00 # of Linear Res. (N)= 3.00

U.H. Tp(hrs)= 1.34

Unit Hyd Qpeak (cms)= 3.877
PEAK FLOW (cms)= 7.619 (i)
TIME TO PEAK (hrs)= 2.833
RUNOFF VOLUME (mm)= 63.320
TOTAL RAINFALL (mm)= 70.137
RUNOFF COEFFICIENT = .903

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| DUHYD (0401) |
| Inlet Cap.= .170 |
| #of Inlets= 1 |
Total(cms)= .2
AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
TOTAL HYD. (ID= 1): 136.00 7.62 2.83 63.32
=====

MAJOR SYS. (ID= 2): 128.21 7.45 2.83 63.32
MINOR SYS. (ID= 3): 7.79 .17 1.08 63.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (0101) | Area (ha)= 343.00 Curve Number (CN)= 78.5
| ID= 1 DT= 5.0 min | Ia (mm)= 7.80 # of Linear Res. (N)= 3.00

U.H. Tp(hrs)= 2.54

Unit Hyd Qpeak (cms)= 5.158
PEAK FLOW (cms)= 5.372 (i)
TIME TO PEAK (hrs)= 4.583
RUNOFF VOLUME (mm)= 29.460
TOTAL RAINFALL (mm)= 70.137
RUNOFF COEFFICIENT = .420

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----  
| ADD HYD (0301) |  
| 1 + 2 = 3 |  
-----  
          AREA      QPEAK      TPEAK      R.V.  
          (ha)      (cms)      (hrs)      (mm)  
ID1= 1 (0401):    7.79      .170      1.08      63.32  
+ ID2= 2 (0101): 343.00    5.372      4.58      29.46  
=====
```

```
ID = 3 (0301):    350.79    5.542      4.58      30.21
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----  
| ADD HYD (0304) |  
| 1 + 2 = 3 |  
-----  
          AREA      QPEAK      TPEAK      R.V.  
          (ha)      (cms)      (hrs)      (mm)  
ID1= 1 (0303):  113.80    2.681      3.17      29.73  
+ ID2= 2 (0301): 350.79    5.542      4.58      30.21  
=====
```

```
ID = 3 (0304):  464.59    7.686      4.17      30.09
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----  
| CALIB |  
| NASHYD (0105) | Area (ha)= 195.00 Curve Number (CN)= 68.3  
| ID= 1 DT= 5.0 min | Ia (mm)= 4.30 # of Linear Res.(N)= 3.00  
-----  
U.H. Tp(hrs)= 3.52
```

Unit Hyd Qpeak (cms)= 2.116

PEAK FLOW (cms)= 1.858 (i)
TIME TO PEAK (hrs)= 5.583
RUNOFF VOLUME (mm)= 23.592
TOTAL RAINFALL (mm)= 70.137
RUNOFF COEFFICIENT = .336

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----  
| CALIB |  
| NASHYD (0104) | Area (ha)= 172.00 Curve Number (CN)= 70.3  
| ID= 1 DT= 5.0 min | Ia (mm)= 8.00 # of Linear Res.(N)= 3.00  
-----  
U.H. Tp(hrs)= 3.65
```

Unit Hyd Qpeak (cms)= 1.800

PEAK FLOW (cms)= 1.533 (i)
TIME TO PEAK (hrs)= 5.750
RUNOFF VOLUME (mm)= 22.786
TOTAL RAINFALL (mm)= 70.137
RUNOFF COEFFICIENT = .325

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----  
| ADD HYD (0305) |  
| 1 + 2 = 3 |  
-----  
          AREA      QPEAK      TPEAK      R.V.  
          (ha)      (cms)      (hrs)      (mm)  
ID1= 1 (0105):  195.00    1.858      5.58      23.59  
+ ID2= 2 (0104): 172.00    1.533      5.75      22.79  
=====
```

ID = 3 (0305): 367.00 3.389 5.67 23.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----  
| ADD HYD (0306) |  
| 1 + 2 = 3 |  
-----  
          AREA   QPEAK   TPEAK   R.V.  
          (ha)   (cms)   (hrs)   (mm)  
ID1= 1 (0304): 464.59  7.686   4.17   30.09  
+ ID2= 2 (0305): 367.00  3.389   5.67   23.21  
=====
```

ID = 3 (0306): 831.59 10.604 4.50 27.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----  
| CALIB  
| NASHYD (0106) | Area (ha)= 138.00 Curve Number (CN)= 80.3  
| ID= 1 DT= 5.0 min | Ia (mm)= 5.40 # of Linear Res. (N)= 3.00  
-----  
U.H. Tp(hrs)= 2.99
```

Unit Hyd Qpeak (cms)= 1.763

PEAK FLOW (cms)= 2.121 (i)

TIME TO PEAK (hrs)= 5.000

RUNOFF VOLUME (mm)= 32.986

TOTAL RAINFALL (mm)= 70.137

RUNOFF COEFFICIENT = .470

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----  
| ADD HYD (0307) |  
| 1 + 2 = 3 |  
-----  
          AREA   QPEAK   TPEAK   R.V.  
          (ha)   (cms)   (hrs)   (mm)  
ID1= 1 (0306): 831.59 10.604 4.50 27.06  
+ ID2= 2 (0106): 138.00 2.121 5.00 32.99  
=====
```

ID = 3 (0307): 969.59 12.677 4.58 27.90

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

FINISH

```
=====
```

APPENDIX B: HYDRAULIC ANALYSIS

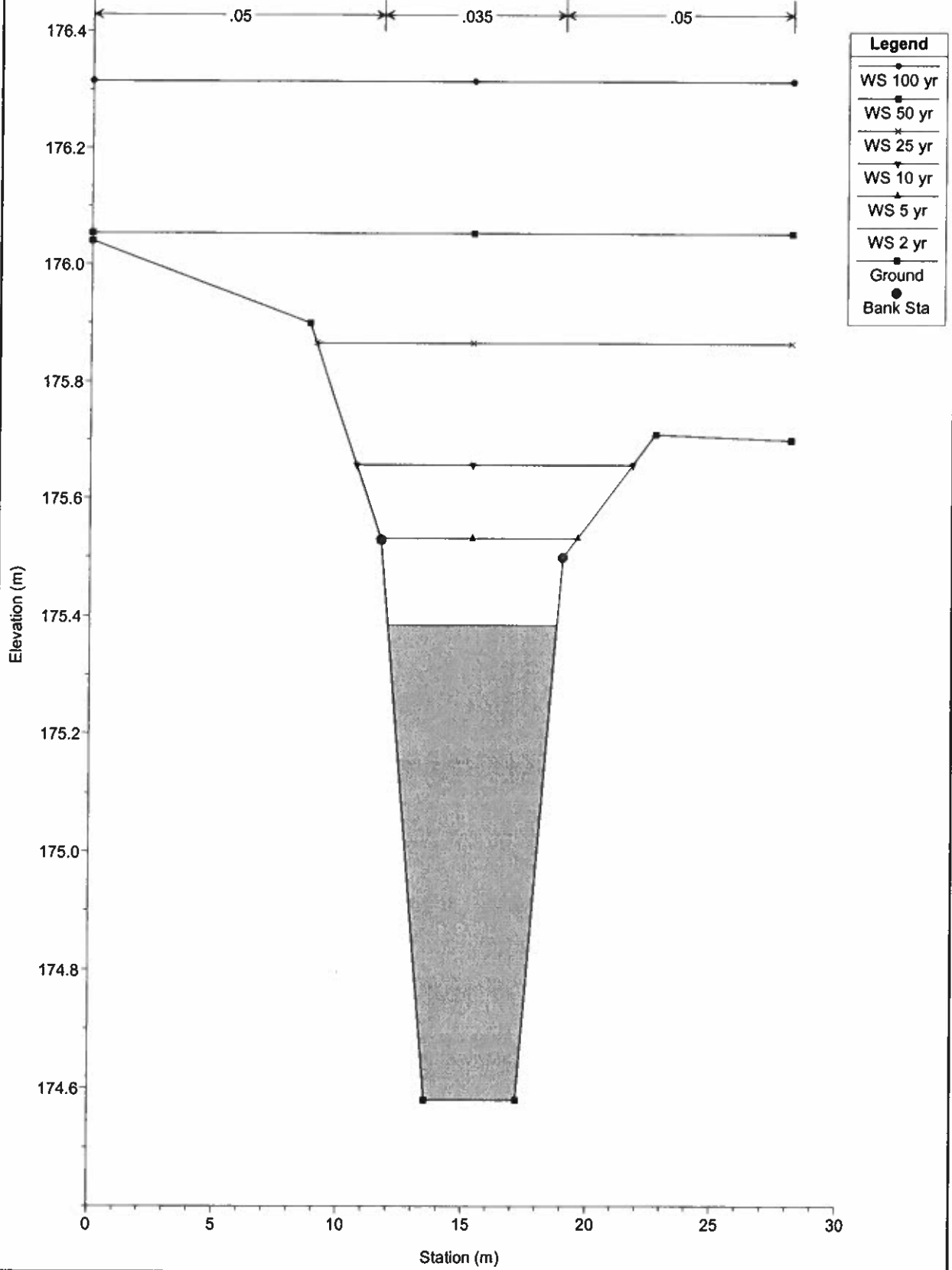
HEC-RAS Plan: exist River: Eagle Marsh Drain Reach: 1

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
1	4000	2 yr	1.78	174.60	175.39		175.40	0.000470	0.43	4.15	6.81	0.18
1	4000	5 yr	2.47	174.60	175.52		175.54	0.000503	0.49	5.10	7.70	0.19
1	4000	10 yr	3.05	174.60	175.62		175.63	0.000505	0.53	5.91	10.01	0.19
1	4000	25 yr	3.98	174.60	175.74		175.76	0.000501	0.58	7.62	18.08	0.19
1	4000	50 yr	4.72	174.60	175.84		175.86	0.000470	0.60	9.39	18.83	0.19
1	4000	100 yr	5.55	174.60	175.95		175.97	0.000425	0.61	11.54	22.37	0.18
1	3991	2 yr	1.78	174.58	175.39	174.85	175.39	0.000440	0.42	4.23	6.80	0.17
1	3991	5 yr	2.47	174.58	175.52	174.92	175.53	0.000478	0.48	5.17	7.61	0.18
1	3991	10 yr	3.05	174.58	175.61	174.96	175.63	0.000484	0.52	5.98	9.90	0.19
1	3991	25 yr	3.98	174.58	175.74	175.03	175.76	0.000485	0.58	7.66	18.05	0.19
1	3991	50 yr	4.72	174.58	175.84	175.08	175.85	0.000458	0.60	9.42	18.80	0.19
1	3991	100 yr	5.55	174.58	175.95	175.13	175.96	0.000415	0.61	11.57	22.14	0.18
1	3990											
1	3971	2 yr	1.78	174.53	175.34	174.75	175.34	0.000218	0.31	5.82	10.39	0.12
1	3971	5 yr	2.47	174.53	175.45	174.81	175.46	0.000247	0.36	7.13	11.82	0.13
1	3971	10 yr	3.05	174.53	175.53	174.84	175.54	0.000266	0.40	8.60	23.86	0.14
1	3971	25 yr	3.98	174.53	175.63	174.90	175.64	0.000278	0.44	11.34	25.77	0.15
1	3971	50 yr	4.72	174.53	175.70	174.94	175.71	0.000286	0.47	13.13	26.44	0.15
1	3971	100 yr	5.55	174.53	175.78	174.99	175.79	0.000282	0.49	15.22	27.19	0.15
1	3961	2 yr	1.78	174.51	175.33	174.73	175.34	0.000204	0.31	5.94	10.37	0.12
1	3961	5 yr	2.47	174.51	175.45	174.79	175.46	0.000233	0.36	7.25	11.79	0.13
1	3961	10 yr	3.05	174.51	175.53	174.83	175.54	0.000253	0.39	8.89	23.71	0.14
1	3961	25 yr	3.98	174.51	175.63	174.88	175.64	0.000268	0.44	11.41	25.75	0.14
1	3961	50 yr	4.72	174.51	175.70	174.92	175.71	0.000277	0.46	13.20	26.41	0.15
1	3961	100 yr	5.55	174.51	175.78	174.97	175.79	0.000274	0.49	15.28	27.17	0.15
1	3936	2 yr	1.78	174.41	175.33		175.33	0.000337	0.37	4.84	7.93	0.15
1	3936	5 yr	2.47	174.41	175.44		175.45	0.000393	0.43	5.79	8.50	0.16
1	3936	10 yr	3.05	174.41	175.52		175.53	0.000446	0.47	6.44	8.86	0.18
1	3936	25 yr	3.98	174.41	175.61		175.63	0.000532	0.54	7.32	9.34	0.20
1	3936	50 yr	4.72	174.41	175.68		175.70	0.000597	0.59	7.95	9.66	0.21
1	3936	100 yr	5.55	174.41	175.75		175.77	0.000641	0.64	8.71	12.17	0.22
1	3447	2 yr	2.29	174.24	175.25		175.26	0.000098	0.16	15.23	50.36	0.08
1	3447	5 yr	3.18	174.24	175.39		175.39	0.000070	0.16	23.06	69.03	0.07
1	3447	10 yr	3.95	174.24	175.46		175.47	0.000065	0.17	28.89	80.15	0.07
1	3447	25 yr	5.16	174.24	175.56		175.57	0.000061	0.18	37.61	94.39	0.07
1	3447	50 yr	6.13	174.24	175.63		175.63	0.000059	0.19	44.31	104.01	0.07
1	3447	100 yr	7.23	174.24	175.71		175.71	0.000055	0.19	53.10	115.41	0.07
1	3432	2 yr	2.29	174.22	175.25	174.56	175.25	0.000090	0.16	15.56	50.16	0.08
1	3432	5 yr	3.18	174.22	175.38	174.61	175.39	0.000066	0.16	23.39	68.89	0.07
1	3432	10 yr	3.95	174.22	175.46	174.66	175.46	0.000062	0.17	29.21	80.02	0.07
1	3432	25 yr	5.16	174.22	175.56	174.71	175.56	0.000058	0.18	37.93	94.26	0.07
1	3432	50 yr	6.13	174.22	175.63	174.75	175.63	0.000057	0.19	44.62	103.88	0.07
1	3432	100 yr	7.23	174.22	175.71	174.80	175.71	0.000053	0.19	53.41	115.29	0.07
1	3431											
1	3420	2 yr	2.29	174.21	175.16		175.16	0.000131	0.20	12.70	40.97	0.09
1	3420	5 yr	3.18	174.21	175.27		175.28	0.000113	0.21	17.97	52.53	0.09
1	3420	10 yr	3.95	174.21	175.36		175.36	0.000100	0.22	22.93	61.45	0.09
1	3420	25 yr	5.16	174.21	175.50		175.50	0.000080	0.22	32.16	75.29	0.08
1	3420	50 yr	6.13	174.21	175.60		175.60	0.000067	0.22	40.39	85.76	0.07
1	3420	100 yr	7.23	174.21	175.70		175.70	0.000059	0.22	49.47	96.00	0.07
1	3410	2 yr	2.29	174.14	175.16		175.16	0.000122	0.19	12.93	40.84	0.09
1	3410	5 yr	3.18	174.14	175.27		175.27	0.000107	0.21	18.20	52.43	0.09
1	3410	10 yr	3.95	174.14	175.36		175.36	0.000096	0.22	23.15	61.35	0.08
1	3410	25 yr	5.16	174.14	175.50		175.50	0.000077	0.22	32.39	75.21	0.08
1	3410	50 yr	6.13	174.14	175.60		175.60	0.000065	0.22	40.62	85.70	0.07
1	3410	100 yr	7.23	174.14	175.70		175.70	0.000057	0.22	49.70	95.94	0.07
1	1475	2 yr	3.17	173.80	174.58	174.13	174.60	0.000770	0.57	5.53	8.55	0.23
1	1475	5 yr	4.43	173.80	174.73	174.20	174.75	0.000810	0.65	6.81	8.99	0.24
1	1475	10 yr	5.51	173.80	174.85	174.25	174.88	0.000796	0.69	7.95	9.37	0.24
1	1475	25 yr	7.24	173.80	175.05	174.33	175.07	0.000818	0.73	9.87	10.91	0.25
1	1475	50 yr	8.62	173.80	175.20	174.39	175.22	0.000808	0.74	11.70	16.90	0.25
1	1475	100 yr	10.19	173.80	175.36	174.45	175.38	0.000620	0.72	16.50	35.15	0.22

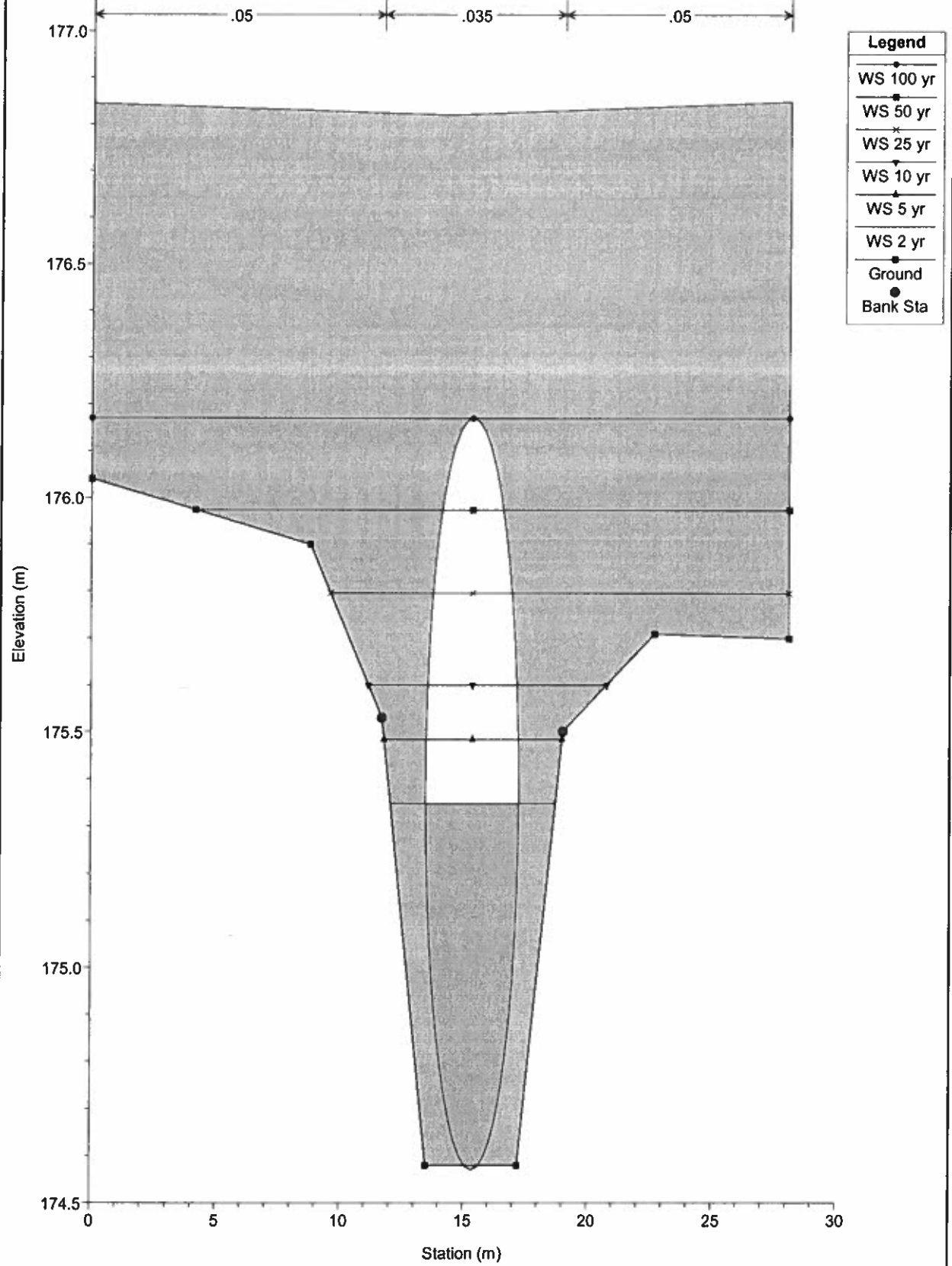
HEC-RAS Plan: exist River: Eagle Marsh Drai Reach: 1 (Continued)

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
1	1485	2 yr	3.17	173.65	174.58	173.96	174.59	0.000466	0.49	6.43	8.31	0.18
1	1485	5 yr	4.43	173.65	174.73	174.04	174.74	0.000547	0.58	7.88	8.75	0.20
1	1465	10 yr	5.51	173.65	174.85	174.10	174.87	0.000576	0.63	8.78	9.13	0.20
1	1485	25 yr	7.24	173.65	175.04	174.18	175.07	0.000644	0.68	10.65	10.72	0.22
1	1485	50 yr	8.62	173.65	175.19	174.24	175.22	0.000671	0.70	12.44	16.21	0.22
1	1485	100 yr	10.19	173.65	175.35	174.31	175.38	0.000536	0.68	17.17	34.92	0.20
1	1464		Culvert									
1	1453	2 yr	3.17	173.62	174.51		174.52	0.000527	0.51	6.18	8.38	0.19
1	1453	5 yr	4.43	173.62	174.63		174.65	0.000665	0.62	7.18	8.75	0.22
1	1453	10 yr	5.51	173.62	174.73		174.75	0.000728	0.68	8.10	9.07	0.23
1	1453	25 yr	7.24	173.62	174.89		174.92	0.000776	0.76	9.58	9.57	0.24
1	1453	50 yr	8.62	173.62	175.01		175.04	0.000789	0.80	10.95	14.79	0.25
1	1453	100 yr	10.19	173.62	175.13		175.17	0.000768	0.84	13.55	28.89	0.25
1	1443	2 yr	3.17	173.61	174.50		174.52	0.000491	0.50	6.32	8.41	0.18
1	1443	5 yr	4.43	173.61	174.62		174.64	0.000626	0.61	7.31	8.75	0.21
1	1443	10 yr	5.51	173.61	174.72		174.75	0.000689	0.67	8.22	9.05	0.22
1	1443	25 yr	7.24	173.61	174.88		174.91	0.000740	0.75	9.70	9.51	0.24
1	1443	50 yr	8.62	173.61	175.00		175.03	0.000758	0.79	10.93	12.86	0.24
1	1443	100 yr	10.19	173.61	175.12		175.16	0.000754	0.83	13.32	27.84	0.24
1	723	2 yr	3.86	173.55	174.34	173.73	174.34	0.000152	0.28	13.65	17.41	0.10
1	723	5 yr	5.38	173.55	174.34	173.77	174.35	0.000294	0.39	13.65	17.41	0.14
1	723	10 yr	6.68	173.55	174.34	173.80	174.35	0.000454	0.49	13.65	17.41	0.18
1	723	25 yr	8.76	173.55	174.34	173.85	174.36	0.000781	0.64	13.65	17.41	0.23
1	723	50 yr	10.40	173.55	174.34	173.89	174.37	0.001100	0.76	13.65	17.41	0.27
1	723	100 yr	12.28	173.55	174.34	173.92	174.38	0.001534	0.90	13.65	17.41	0.32

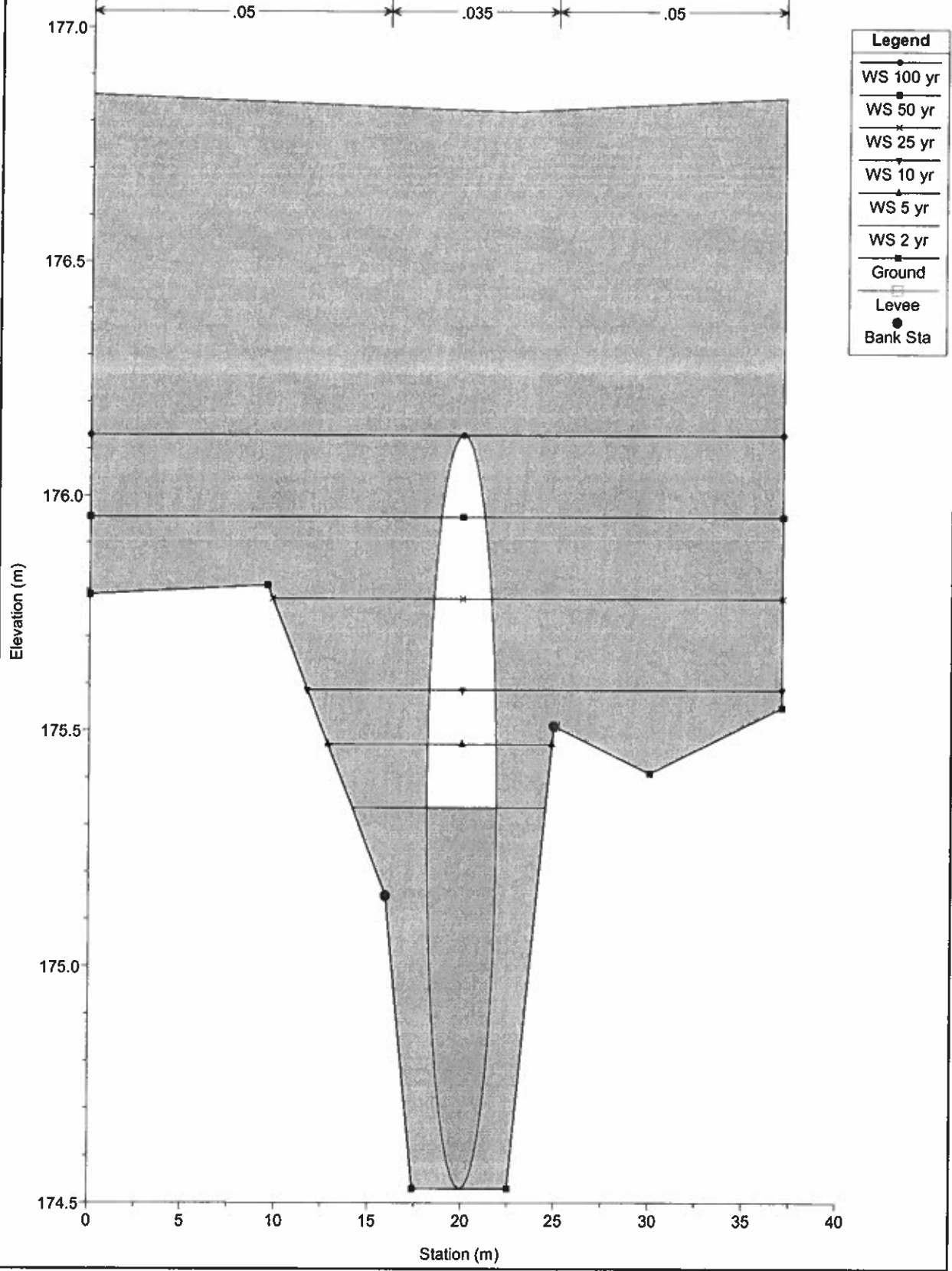
Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 3991 upstream of Hwy 3 crossing



Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 Highway 3 crossing

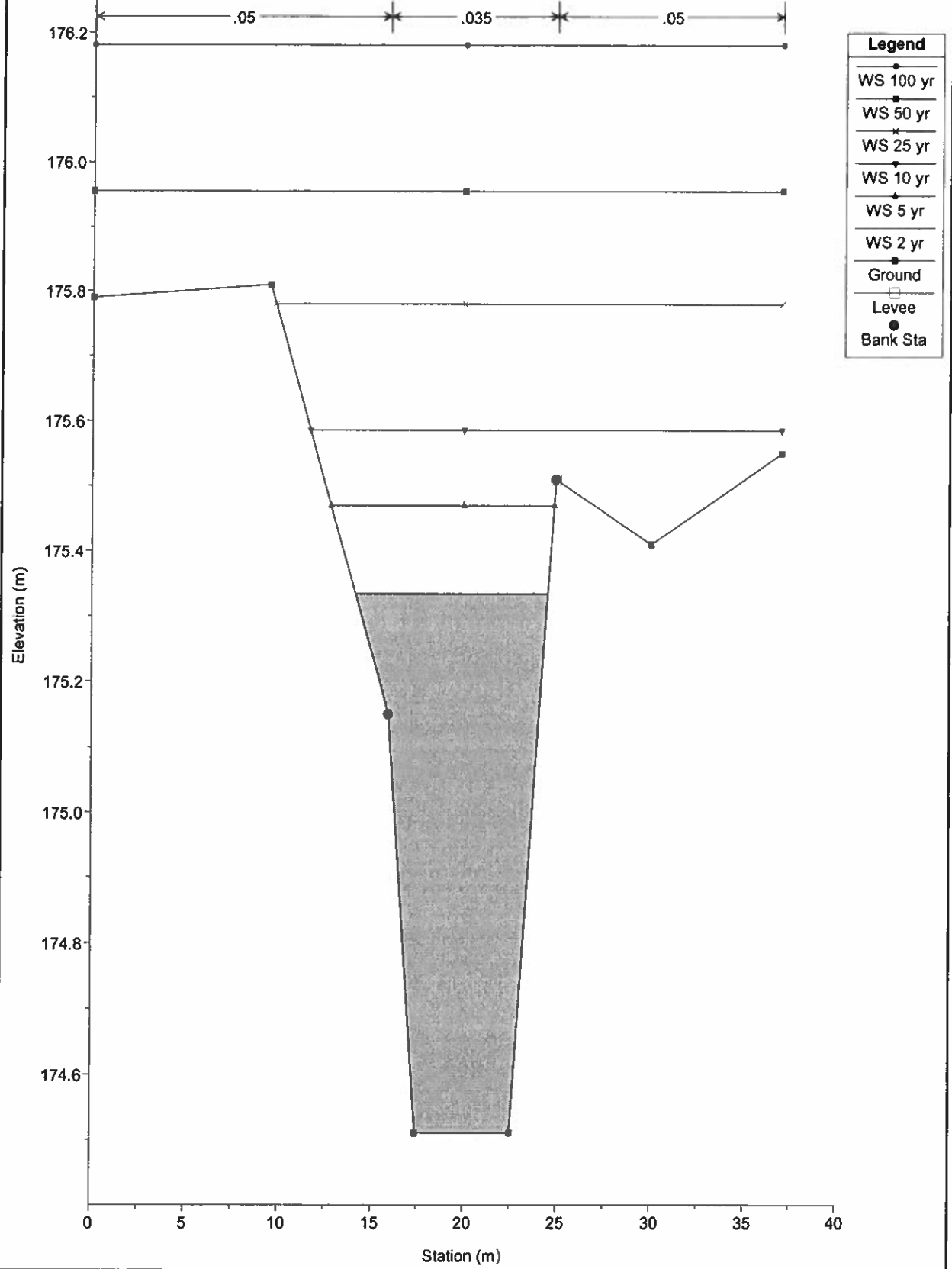


Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 Highway 3 crossing

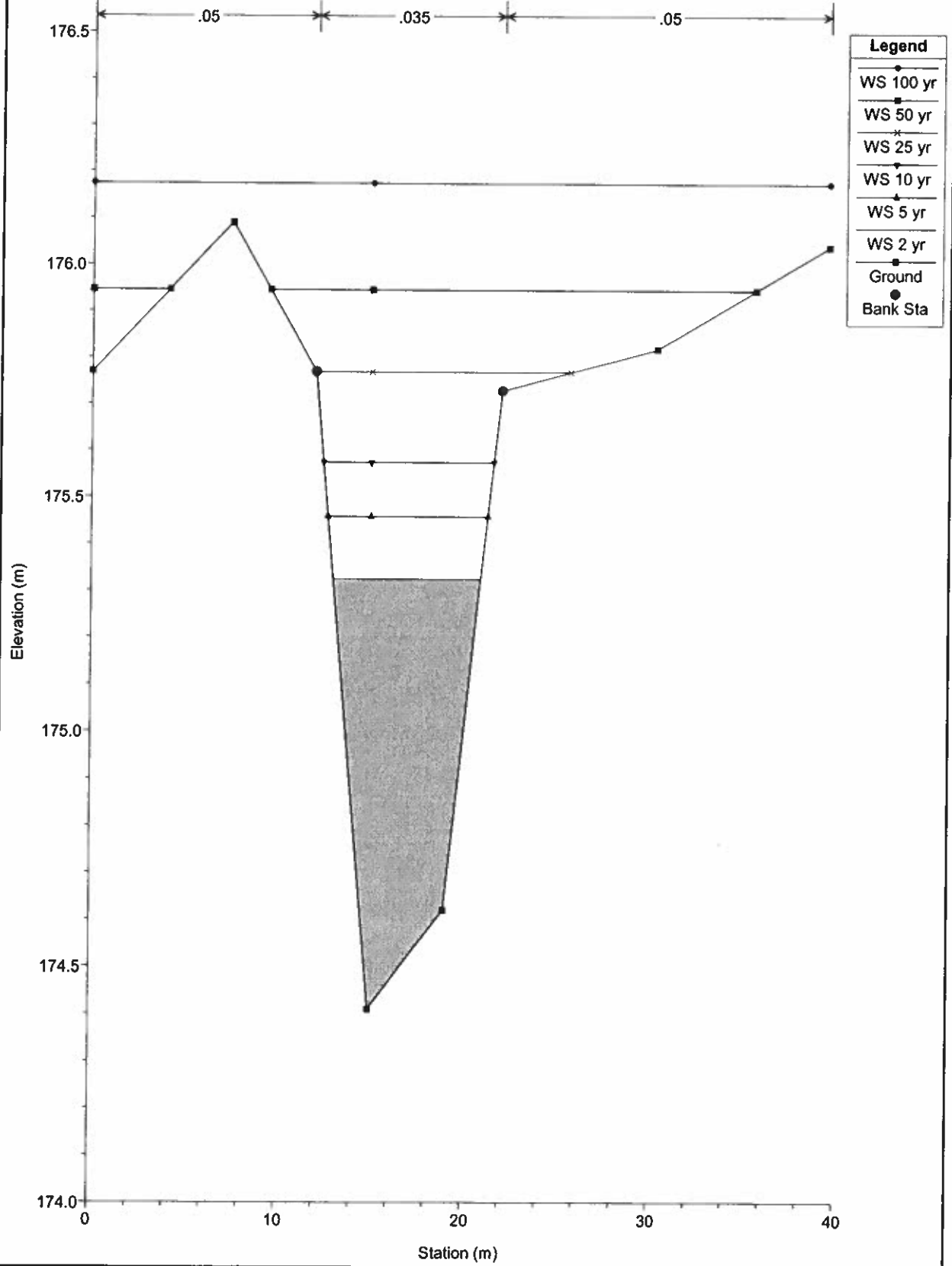


Legend	
●	WS 100 yr
●	WS 50 yr
×	WS 25 yr
▲	WS 10 yr
▲	WS 5 yr
■	WS 2 yr
□	Ground
▭	Levee
●	Bank Sta

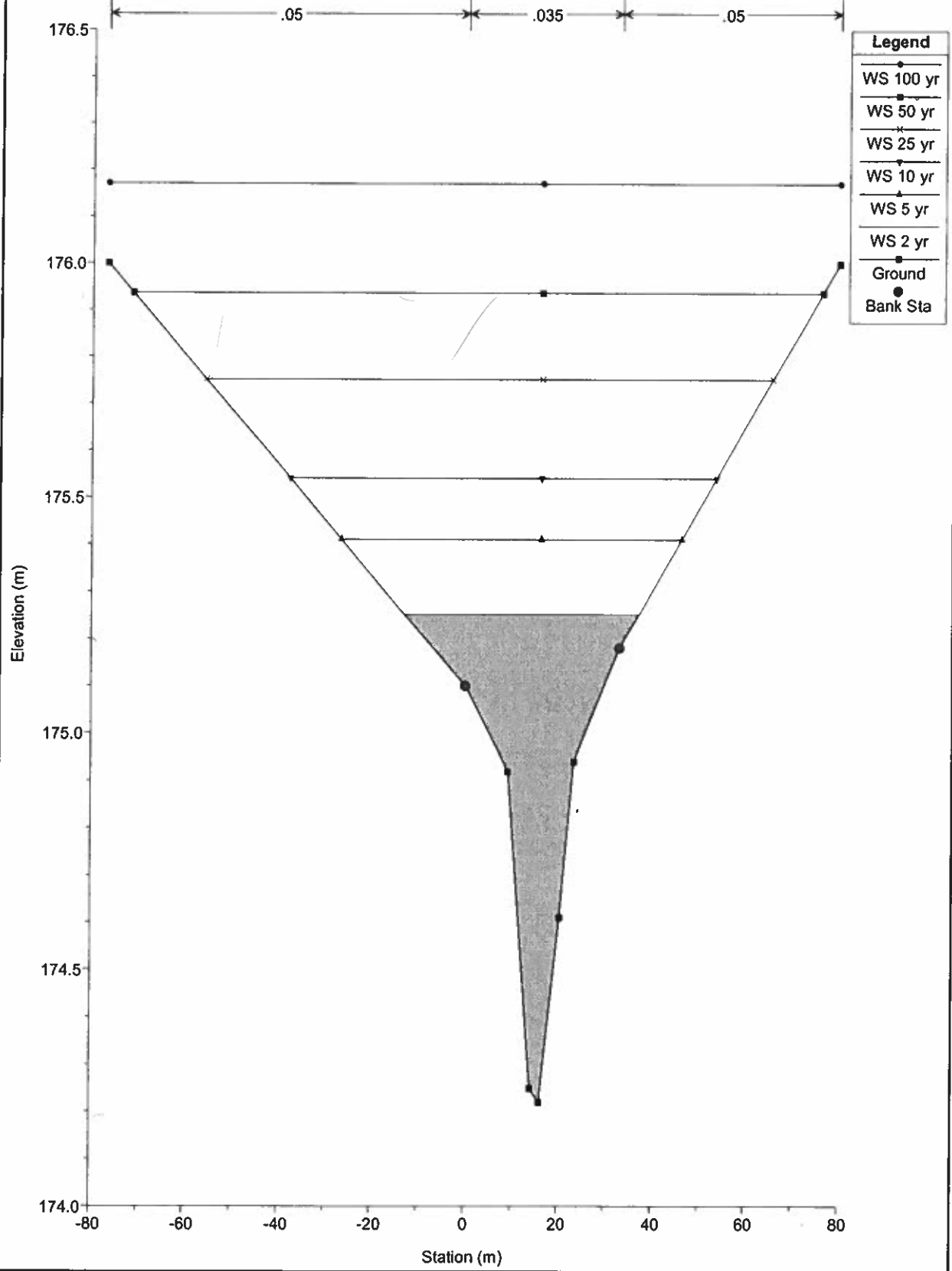
Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 3961



Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 3936



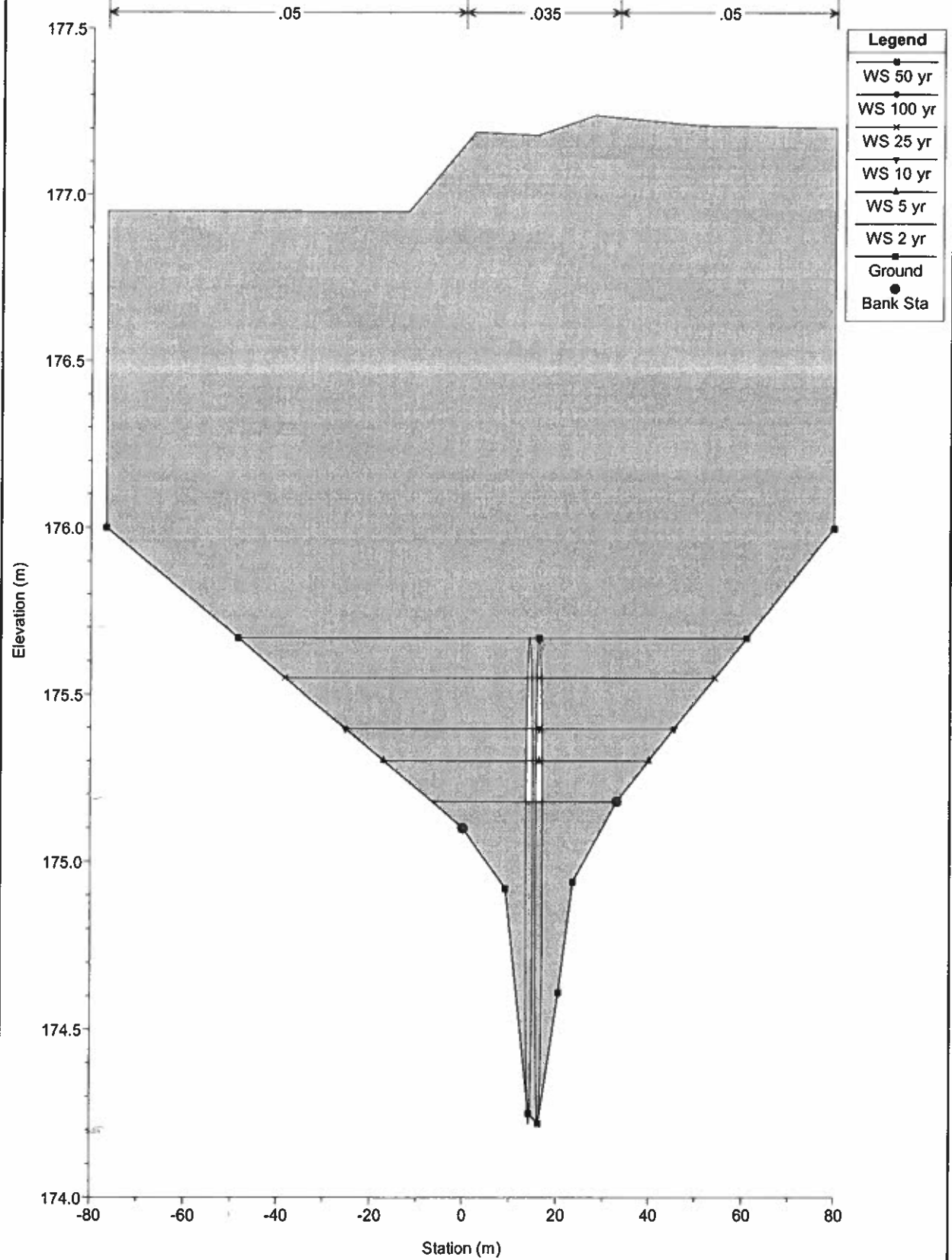
Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 3432 upstream of rail berm at d/s end of Reeb Quarry



1.7 m
 140 m

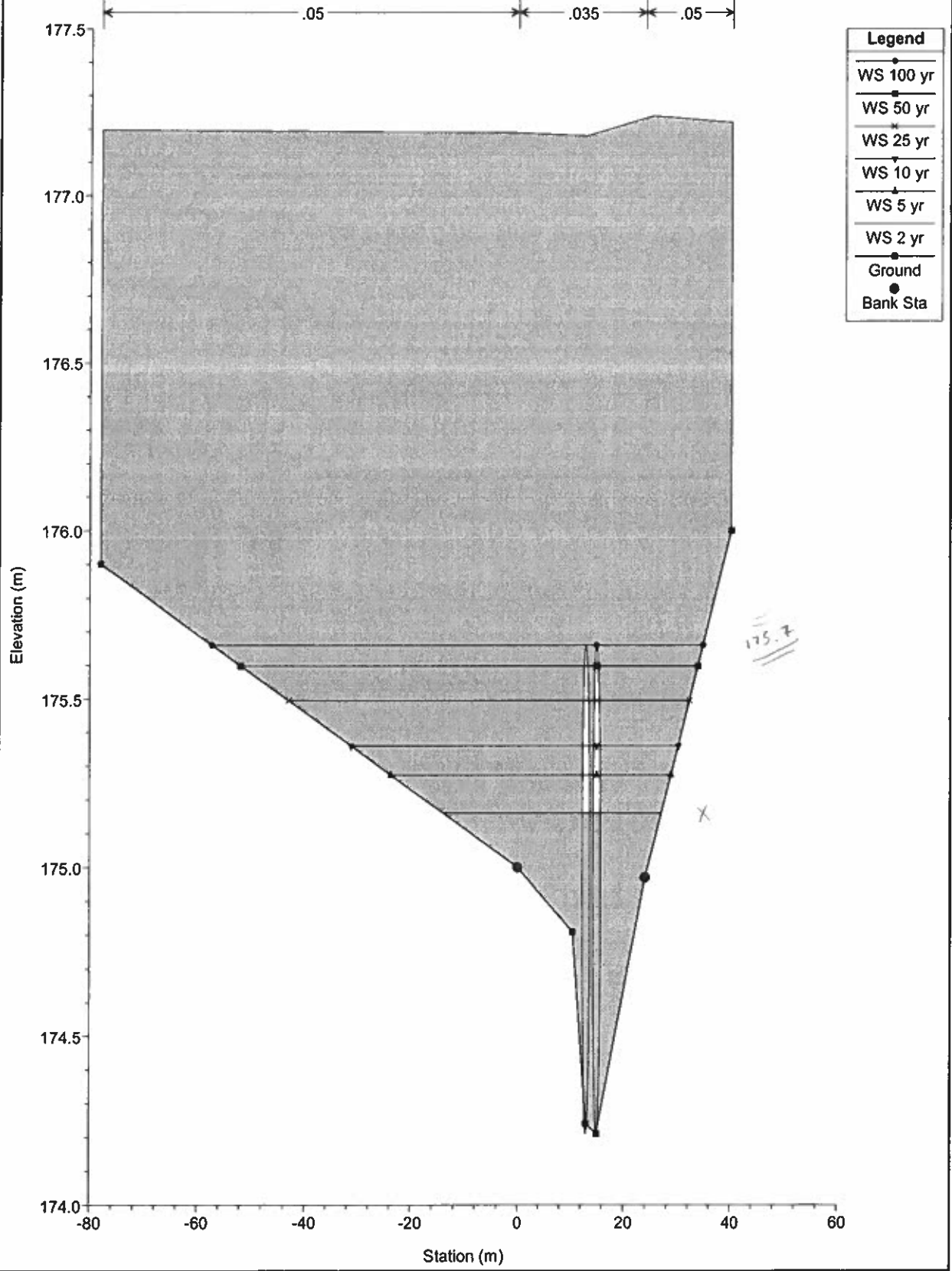
Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008

Rail Berm Crossing

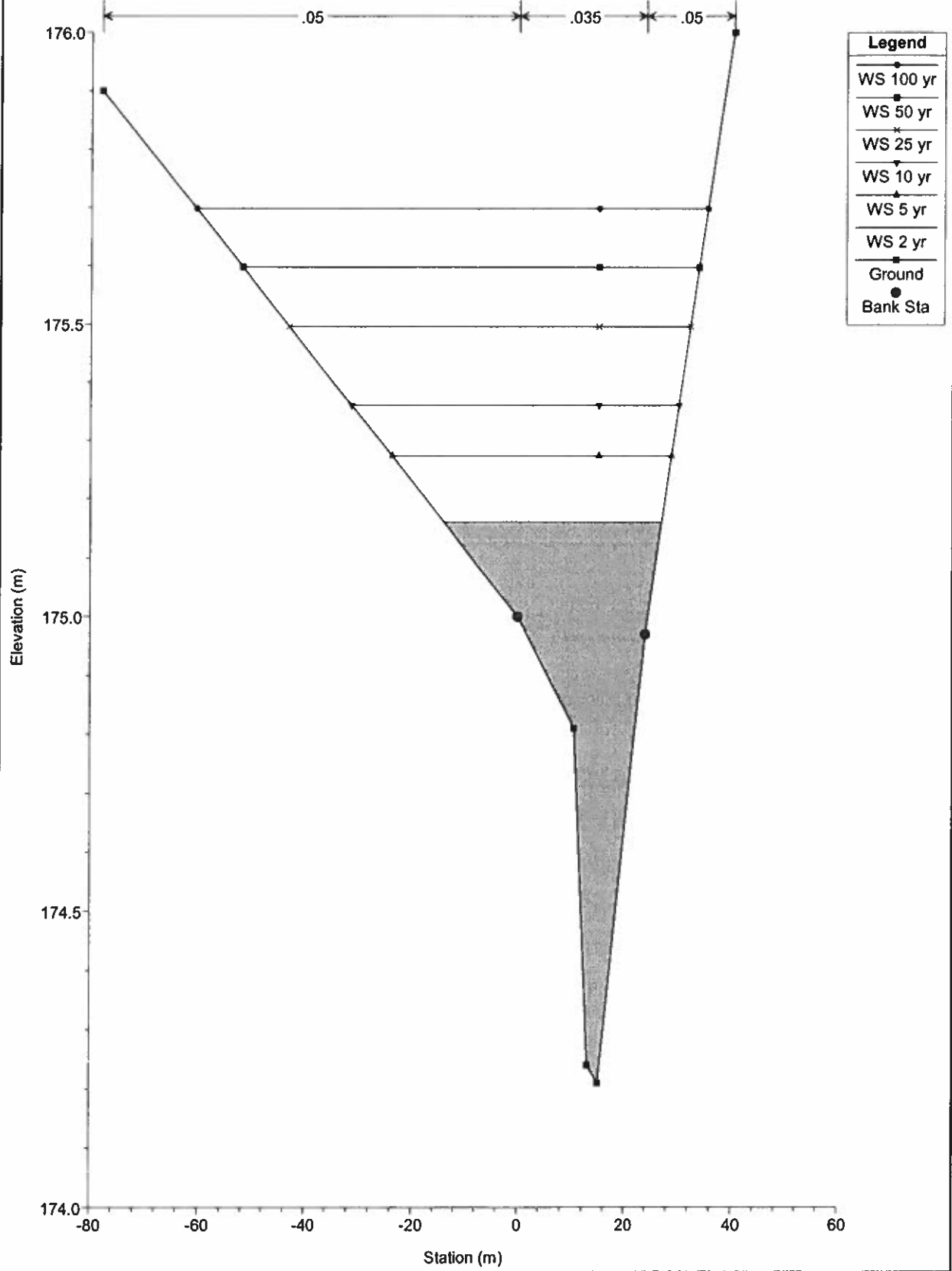


1.7
110 m

Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 Rail Berm Crossing

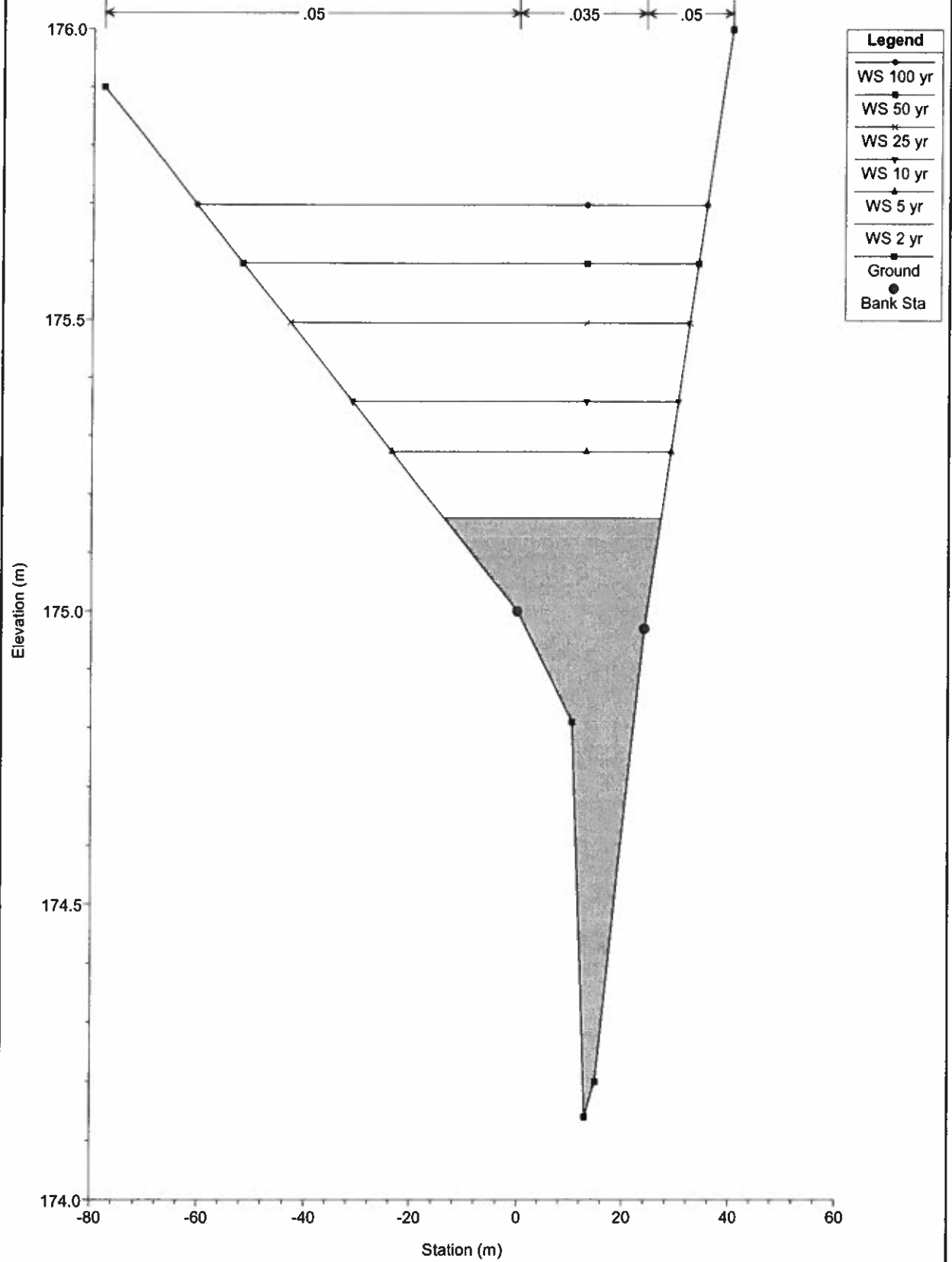


Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 3420 downstream of rail berm



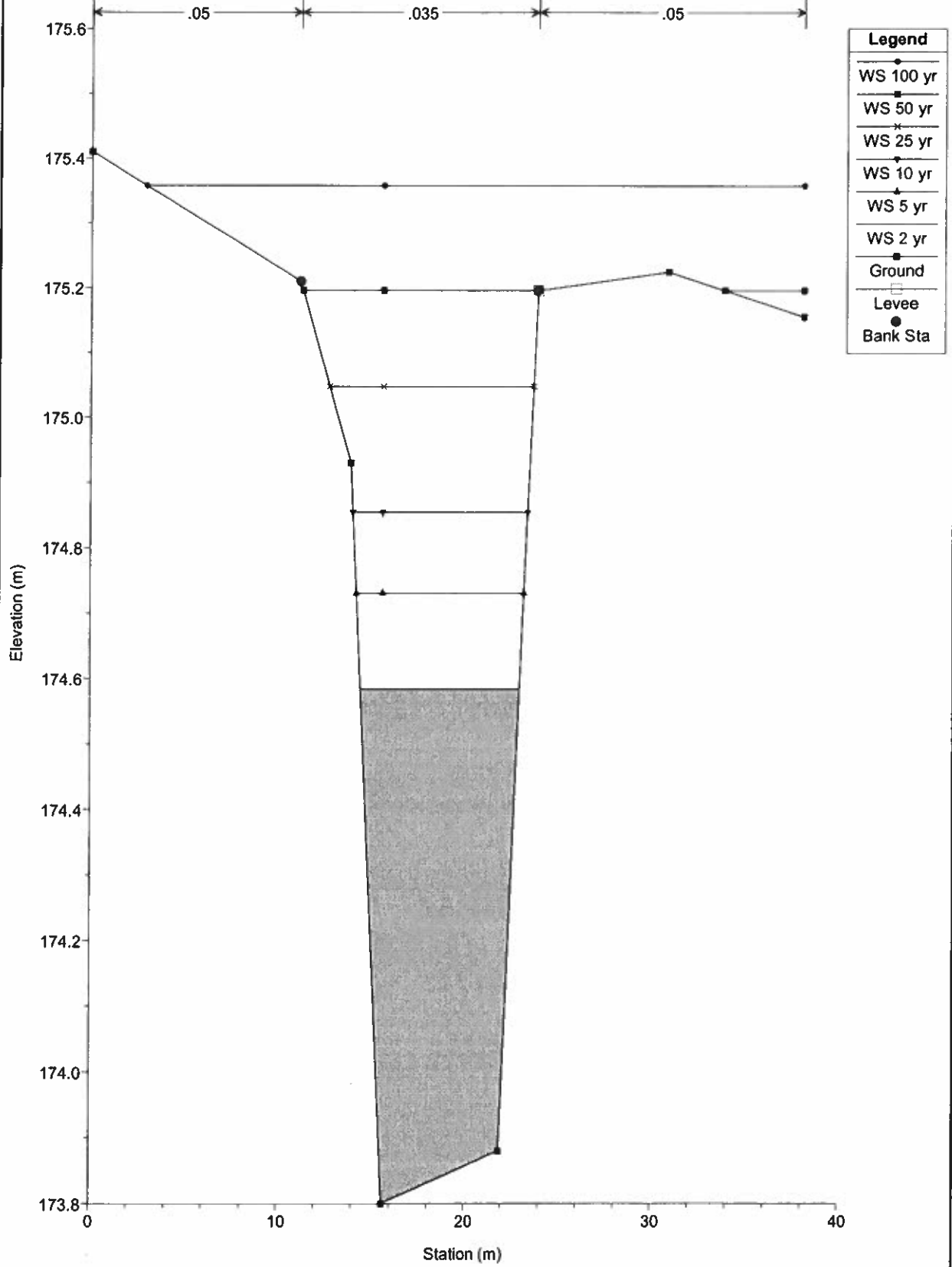
Legend	
●	WS 100 yr
■	WS 50 yr
×	WS 25 yr
▲	WS 10 yr
▼	WS 5 yr
■	WS 2 yr
—	Ground
●	Bank Sta

Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 3410 downstream of rail berm

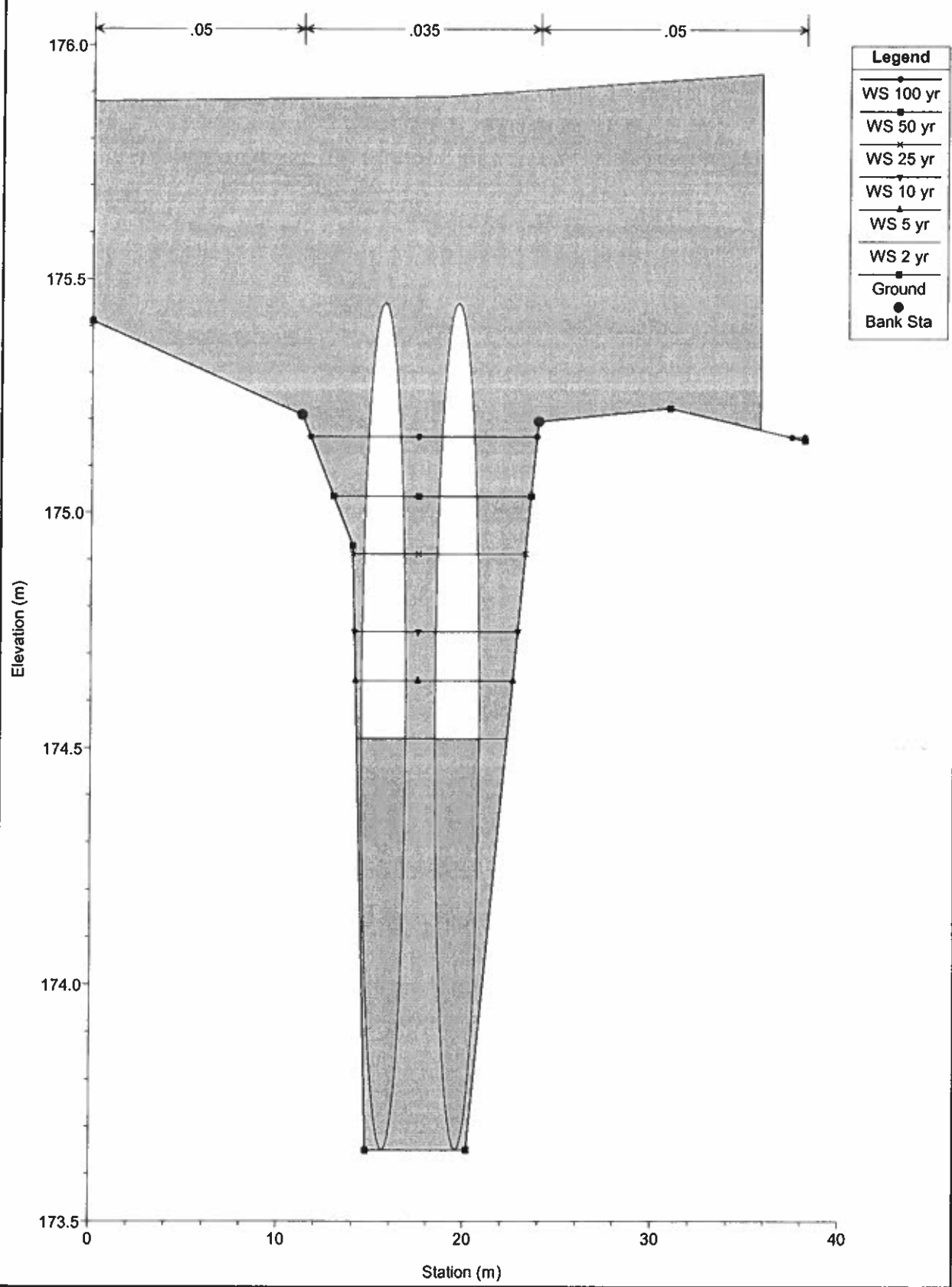


Legend	
●	WS 100 yr
●	WS 50 yr
×	WS 25 yr
▼	WS 10 yr
▲	WS 5 yr
●	WS 2 yr
●	Ground
●	Bank Sta

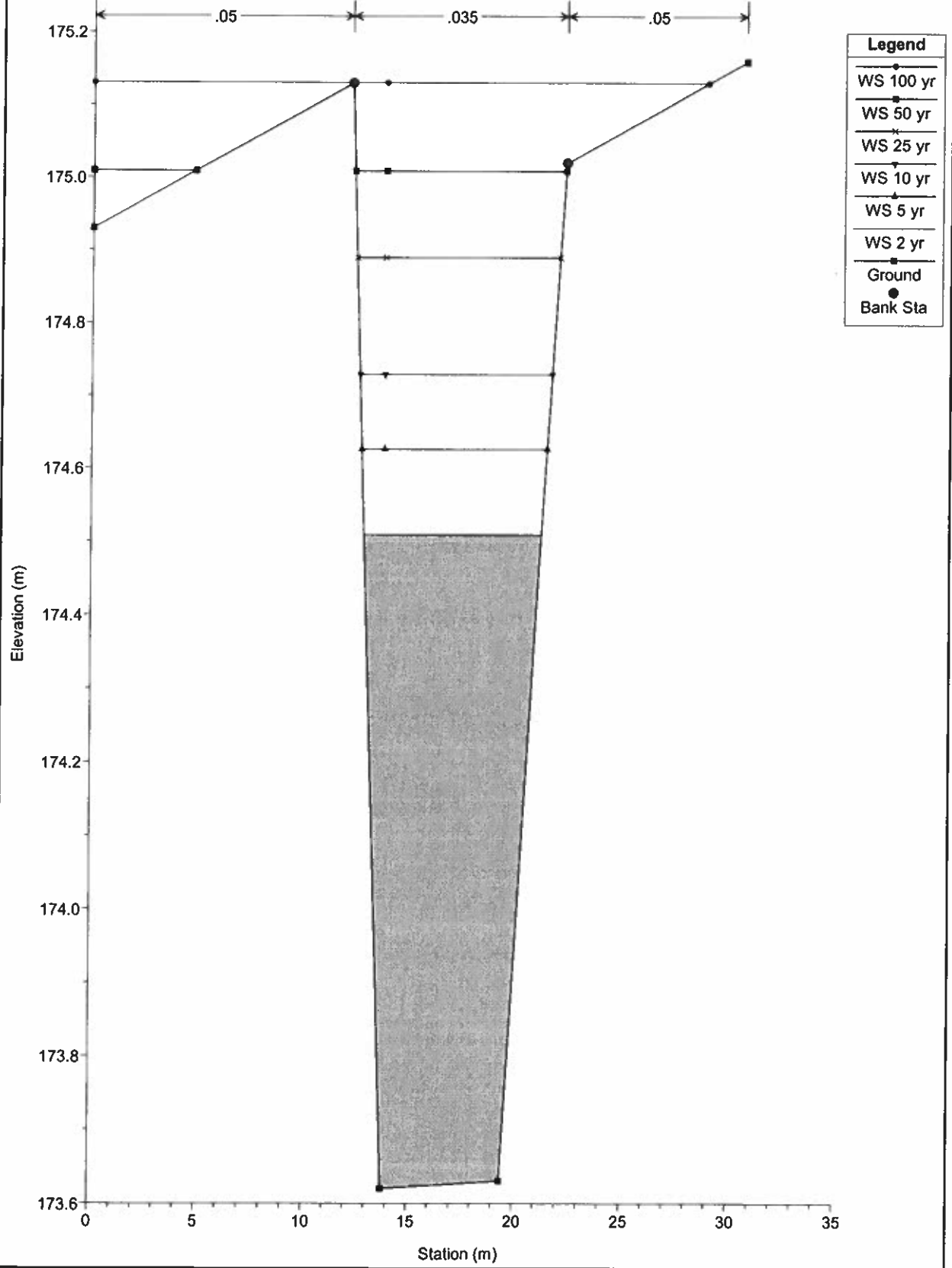
Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 1475 upstream of Cement Plant Road



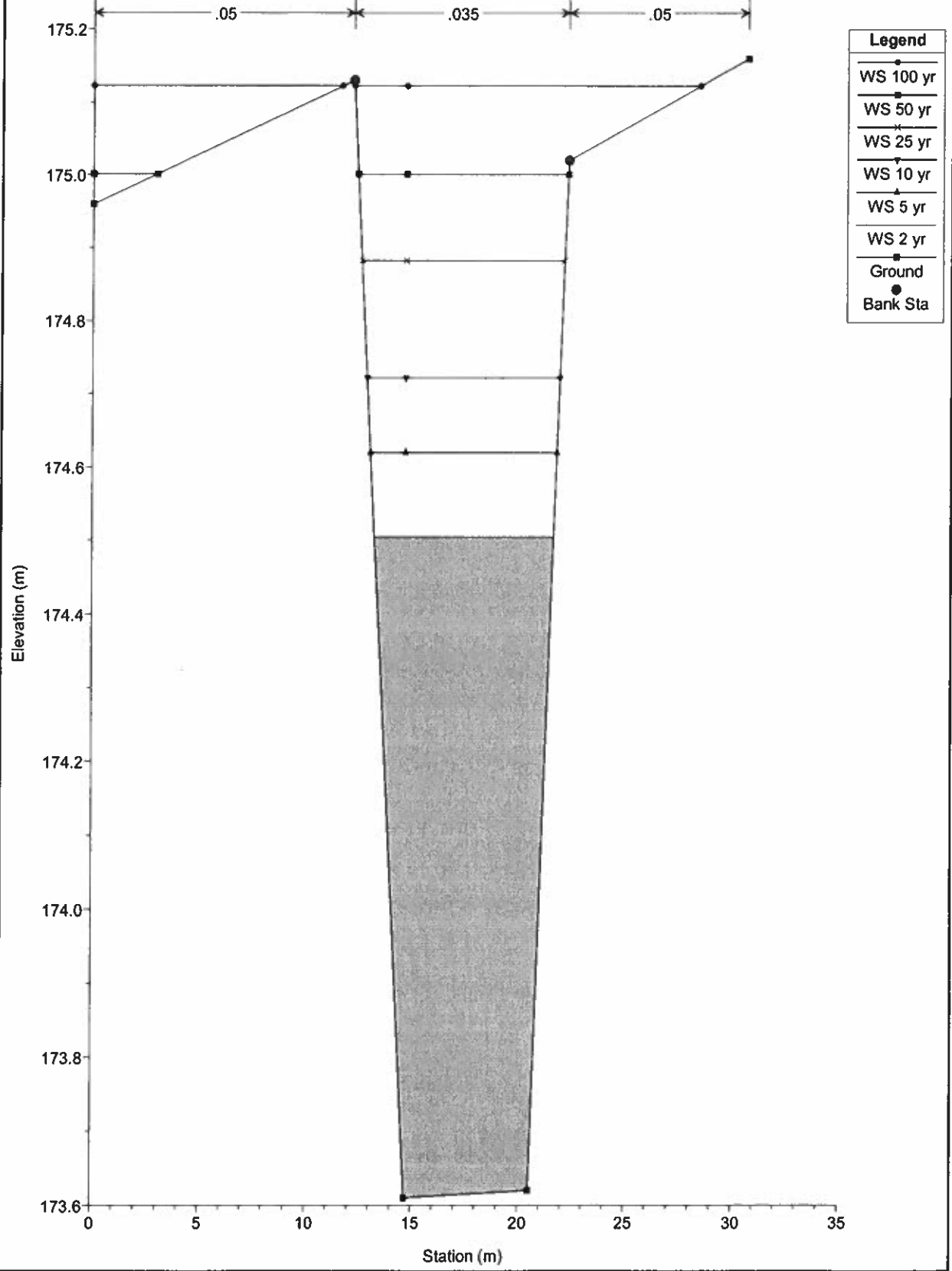
Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008



Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 1453 Downstream of Cement Plant Road



Reeb Quarry - Eagle Marsh Drain Plan: Existing w normal lake level 30/01/2008
 sec 1443 Downstream of Cement Plant Road



Township of Wainfleet
Reeb Quarry
Water Management Report

Table B1
Eagle Marsh Drain Capacity (m³/s) at Specified Locations Based on Lake Erie Water Levels

Location		Starting Water Surface Elevation (m)				
		174.34	174.6	174.8	175.0	175.2
1	Highway 3	3.0	3.0	3.0	3.0	2.7
2	Rail Berm	2.10	2.10	2.10	1.60	0
3	Cement Plant Road	9.1	9.1	8.4	6.6	0
4	Upstream of flood gate at Lake Erie	204	204	204	204	204

Channel Capacity Determination for EMD at Hwy 3

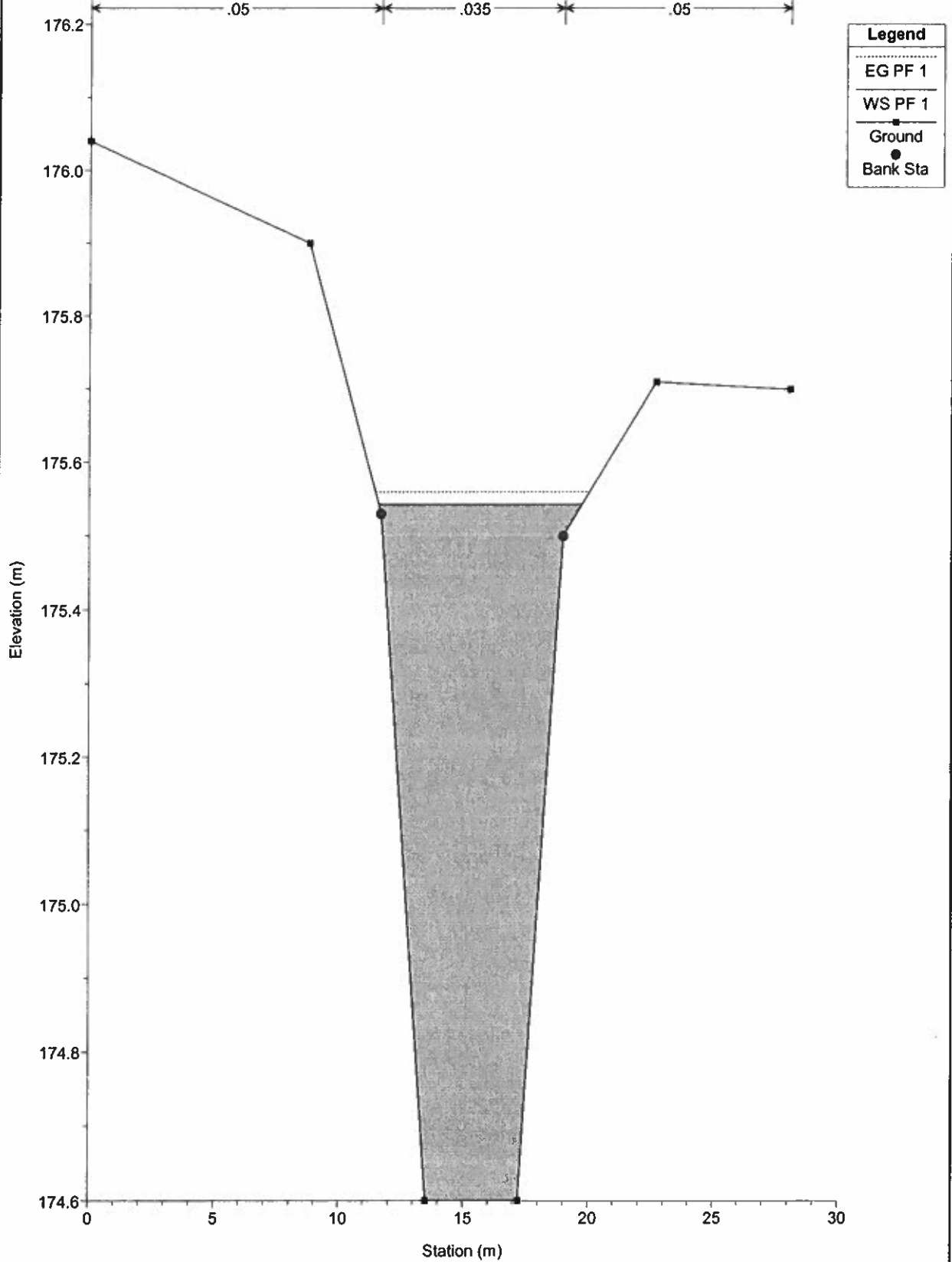
HEC-RAS Plan: 174.34.1 River: Eagle Marsh Drain Reach: 1 Profile: PF 1

1-3 sections

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
1	4000	PF 1	3.00	174.60	175.54		175.56	0.000676	0.57	5.25	8.16	0.22
1	3991	PF 1	3.00	174.58	175.54	174.96	175.55	0.000650	0.57	5.32	8.02	0.21
1	3990		Culvert									
1	3971	PF 1	3.00	174.53	175.44	174.84	175.45	0.000393	0.45	6.92	11.60	0.17
1	3961	PF 1	3.00	174.51	175.43	174.82	175.44	0.000373	0.45	7.02	11.56	0.16
1	3936	PF 1	3.00	174.41	175.42		175.43	0.000646	0.54	5.57	8.37	0.21
1	3447	PF 1	3.00	174.24	175.33		175.33	0.000094	0.17	19.34	60.87	0.08
1	3432	PF 1	3.00	174.22	175.33	174.60	175.33	0.000088	0.17	19.66	60.68	0.08
1	3431		Culvert									
1	3420	PF 1	3.00	174.21	175.19		175.19	0.000182	0.24	13.88	43.83	0.11
1	3410	PF 1	3.00	174.14	175.19		175.19	0.000172	0.24	14.09	43.65	0.11
1	1475	PF 1	3.00	173.80	174.55	174.12	174.56	0.000830	0.58	5.20	8.43	0.23
1	1465	PF 1	3.00	173.65	174.54	173.95	174.55	0.000485	0.49	6.11	8.19	0.18
1	1464		Culvert									
1	1453	PF 1	3.00	173.62	174.47		174.48	0.000556	0.51	5.84	8.25	0.19
1	1443	PF 1	3.00	173.61	174.46		174.48	0.000518	0.50	5.98	8.29	0.19
1	723	PF 1	3.00	173.55	174.34	173.70	174.34	0.000092	0.22	13.65	17.41	0.08

starting water el = 174.34 m

Reeb Quarry - Eagle Marsh Drain Plan: 174.34 1 24/01/2008
sec 4000 upstream of Hwy 3 crossing



Channel Capacity Determination for EMD at Rail Berm

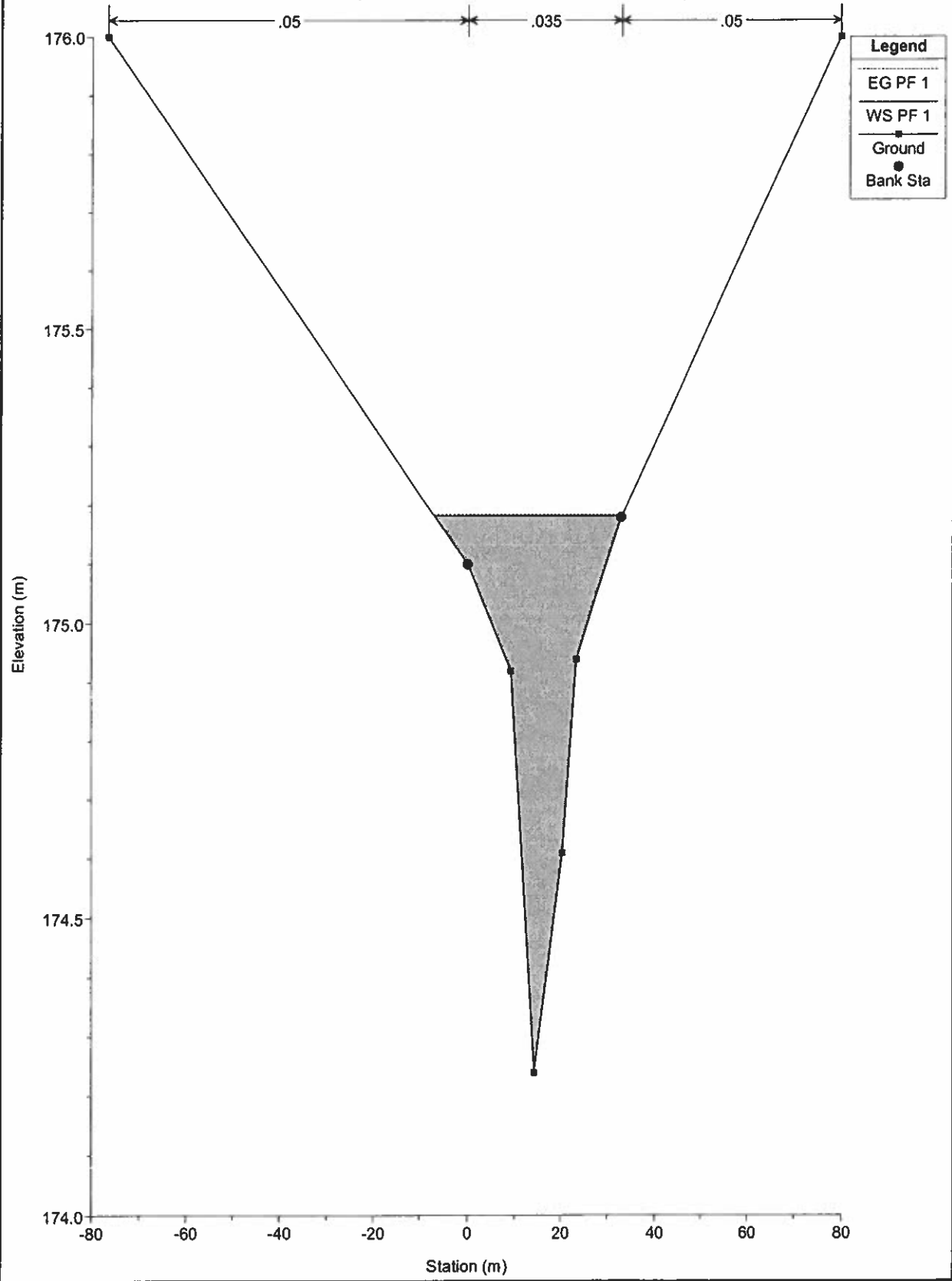
HEC-RAS Plan: 174.34.2 River: Eagle Marsh Drain Reach: 1 Profile: PF 1

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
1	4000	PF 1	2.10	174.60	175.40		175.41	0.000628	0.50	4.21	6.84	0.20
1	3991	PF 1	2.10	174.58	175.39	174.88	175.41	0.000592	0.49	4.28	6.83	0.20
1	3990		Culvert									
1	3971	PF 1	2.10	174.53	175.32	174.78	175.33	0.000328	0.38	5.66	10.19	0.15
1	3981	PF 1	2.10	174.51	175.32	174.76	175.32	0.000307	0.37	5.77	10.16	0.15
1	3936	PF 1	2.10	174.41	175.30		175.31	0.000520	0.45	4.67	7.82	0.19
1	3447	PF 1	2.10	174.24	175.18		175.18	0.000157	0.18	11.96	40.06	0.10
1	3432	PF 1	2.10	174.22	175.18	174.54	175.18	0.000143	0.17	12.27	39.75	0.09
1	3431		Culvert									
1	3420	PF 1	2.10	174.21	175.09		175.09	0.000206	0.22	9.90	33.25	0.11
1	3410	PF 1	2.10	174.14	175.08		175.09	0.000190	0.21	10.12	33.05	0.11
1	1475	PF 1	2.10	173.80	174.45	174.06	174.47	0.000652	0.47	4.45	8.16	0.20
1	1485	PF 1	2.10	173.65	174.45	173.89	174.46	0.000344	0.39	5.38	7.92	0.15
1	1484		Culvert									
1	1453	PF 1	2.10	173.62	174.41		174.42	0.000354	0.39	5.34	8.06	0.15
1	1443	PF 1	2.10	173.61	174.40		174.41	0.000326	0.38	5.49	8.12	0.15
1	723	PF 1	2.10	173.55	174.34	173.67	174.34	0.000045	0.15	13.65	17.41	0.06

starting water el. = 174.34 m

Berm sections

Reeb Quarry - Eagle Marsh Drain Plan: 174.34 2 24/01/2008
sec 3447 upstream of rail berm a d/s end of Reeb Quarry



Channel Capacity Determination for EMD at Cement Plant Road

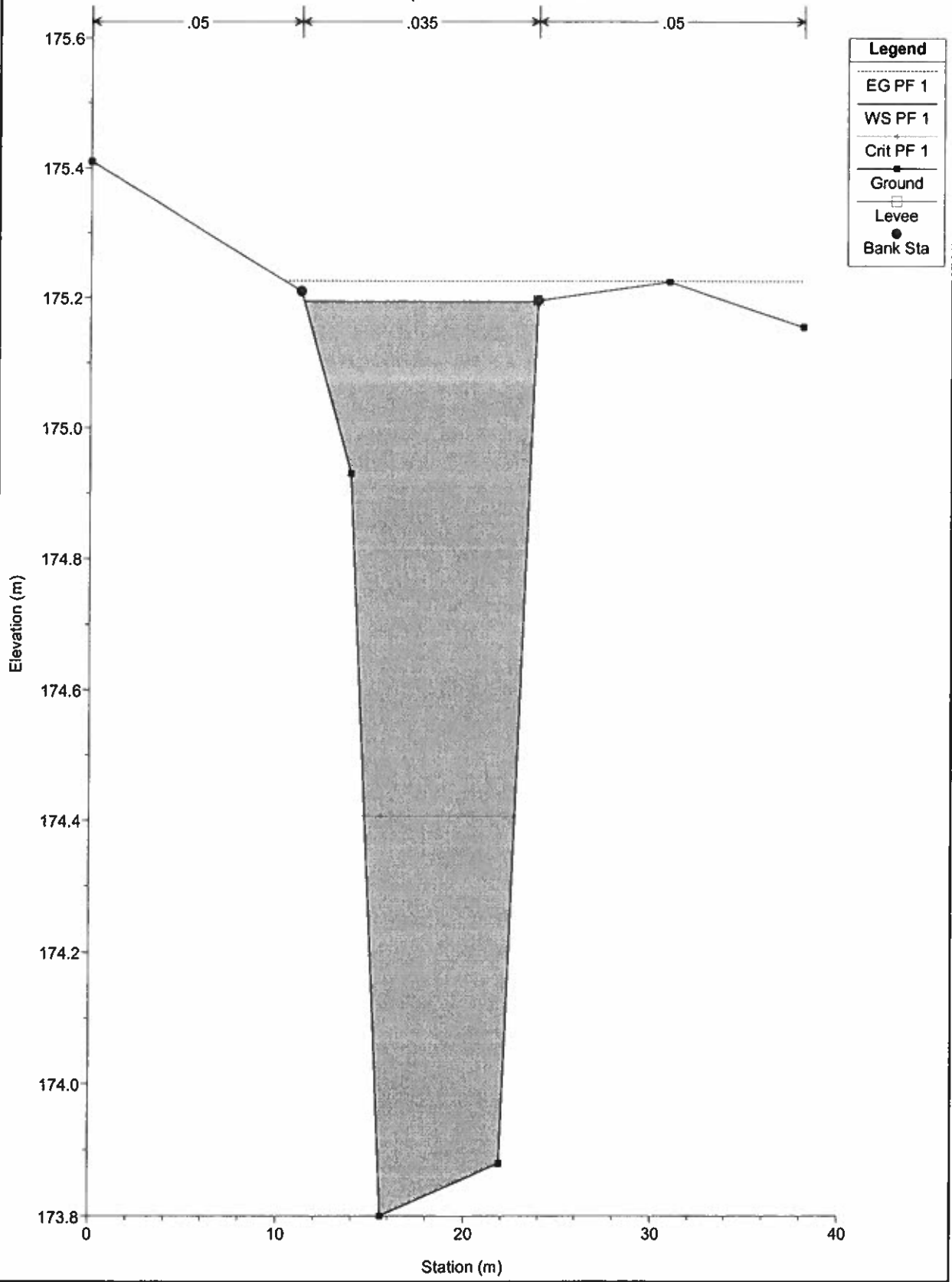
HEC-RAS Plan: 174.34.3 River: Eagle Marsh Drain Reach: 1 Profile: PF 1

Reach	River Sta	Profile	Q Total (m ³ /s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m ²)	Top Width (m)	Froude # Chl
1	4000	PF 1	9.10	174.60	176.27		176.28	0.000350	0.66	20.23	28.10	0.17
1	3991	PF 1	9.10	174.58	176.28	175.32	176.28	0.000345	0.65	20.25	28.10	0.17
1	3990											
		Culvert										
1	3971	PF 1	9.10	174.53	175.85	175.15	175.87	0.000594	0.74	17.52	37.00	0.22
1	3961	PF 1	9.10	174.51	175.84	175.13	175.86	0.000588	0.74	17.43	37.00	0.22
1	3936	PF 1	9.10	174.41	175.79		175.84	0.001527	1.01	9.17	15.87	0.34
1	3447	PF 1	9.10	174.24	175.71		175.71	0.000988	0.25	52.86	115.11	0.08
1	3432	PF 1	9.10	174.22	175.71	174.86	175.71	0.000085	0.24	53.11	114.93	0.08
1	3431											
		Culvert										
1	3420	PF 1	9.10	174.21	175.67		175.67	0.000105	0.29	46.90	93.21	0.09
1	3410	PF 1	9.10	174.14	175.67		175.67	0.000103	0.29	47.08	93.11	0.09
1	1475	PF 1	9.10	173.80	175.19	174.41	175.23	0.000906	0.78	11.60	12.55	0.26
1	1465	PF 1	9.10	173.65	175.19	174.26	175.22	0.000751	0.74	12.40	15.92	0.24
1	1464											
		Culvert										
1	1453	PF 1	9.10	173.62	174.97		175.01	0.000966	0.87	10.48	12.58	0.27
1	1443	PF 1	9.10	173.61	174.97		175.00	0.000929	0.87	10.51	10.16	0.27
1	723	PF 1	9.10	173.55	174.34	173.86	174.36	0.000842	0.67	13.65	17.41	0.24

Cement Plant Road
Sections

starting water el = 174.34m

Reeb Quarry - Eagle Marsh Drain Plan: 174.34 3 24/01/2008
 sec 1475 upstream of Cement Plant Road

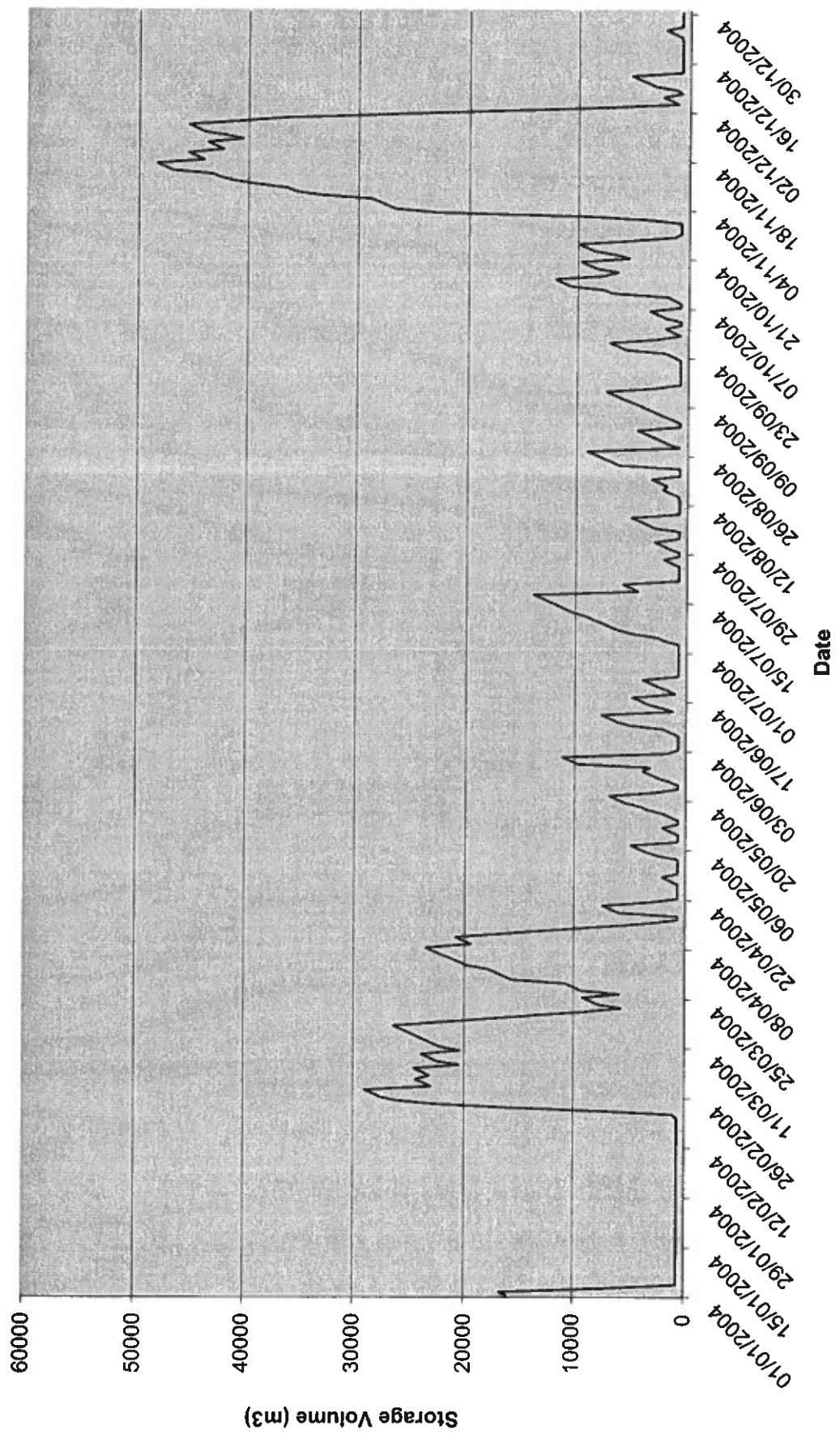


APPENDIX C: WATER BALANCE ANALYSIS

Township of Wainfleet
Reeb Quarry
Water Management Report

PHASE 1A WATER BALANCE

**Storage Volumes - Phase 1A Scenario (Regular Groundwater Inflow)
1985 - Highest Year Recorded**



Running Daily Water Balance, Reab Quarry - Phase 1A
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.25
 Elevation 175.3
 Climate Id 6136606
 WMO Identifier
 TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/e 0.0625 m³/e
 59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
 705 m³/day
 4.15 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 284.33 mm
 48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (m ³)	Storage Volume (m ³)	Allowable Release (mm)	Storage Carryover (mm)
01/01/1965	8	0.4	0	0.4	0.00	28.65	0.00	0.94	9.07	0.90	0.00	4.15	94.03	15884.87	0.00	94.03
02/01/1965	-2.5	0	0	0	0.00	0.00	0.00	0.65	9.11	0.55	0.00	4.15	98.17	16669.57	59.29	38.88
03/01/1965	-3.8	0	0	0	0.00	0.00	0.00	0.52	9.15	0.53	0.00	4.15	43.03	7314.57	59.29	0.00
04/01/1965	-3.8	0	0.8	0.8	0.80	0.00	0.00	0.52	9.19	0.53	0.00	4.15	4.15	705.00	59.29	0.00
05/01/1965	-2.8	0	0	0	0.80	0.00	0.00	0.63	9.23	0.65	0.00	4.15	4.15	705.00	59.29	0.00
06/01/1965	-1.3	0	0	0	0.80	0.00	0.00	0.58	9.27	0.69	0.00	4.15	4.15	705.00	59.29	0.00
07/01/1965	-1.3	0	3.4	3.4	4.20	0.00	0.00	0.58	9.31	0.69	0.00	4.15	4.15	705.00	59.29	0.00
08/01/1965	-1.1	0	0	0	4.20	0.00	0.00	0.27	9.35	0.29	0.00	4.15	4.15	705.00	59.29	0.00
09/01/1965	-1.3	0	0	0	4.20	0.00	0.00	0.26	9.39	0.27	0.00	4.15	4.15	705.00	59.29	0.00
10/01/1965	-10.0	0	1	1	5.20	0.00	0.00	0.27	9.43	0.29	0.00	4.15	4.15	705.00	59.29	0.00
11/01/1965	-8.8	0	0	0	14.20	0.00	0.00	0.44	9.47	0.46	0.00	4.15	4.15	705.00	59.29	0.00
12/01/1965	-5	0	0.8	0.8	14.80	0.00	0.00	0.50	9.51	0.52	0.00	4.15	4.15	705.00	59.29	0.00
13/01/1965	-2.8	0	0.4	0.4	15.20	0.00	0.00	0.55	9.55	0.58	0.00	4.15	4.15	705.00	59.29	0.00
14/01/1965	-2.3	0	0.2	0.2	24.40	0.00	0.00	0.55	9.59	0.58	0.00	4.15	4.15	705.00	59.29	0.00
15/01/1965	-11.6	0	0	0	24.40	0.00	0.00	0.26	9.63	0.29	0.00	4.15	4.15	705.00	59.29	0.00
16/01/1965	-10.3	0	5	5	29.40	0.00	0.00	0.27	9.67	0.30	0.00	4.15	4.15	705.00	59.29	0.00
17/01/1965	-4.8	0	0	0	29.40	0.00	0.00	0.50	9.70	0.53	0.00	4.15	4.15	705.00	59.29	0.00
18/01/1965	-4	0	8.8	8.8	38.00	0.00	0.00	0.52	9.74	0.57	0.00	4.15	4.15	705.00	59.29	0.00
19/01/1965	-6.9	0	8.8	8.8	46.80	0.00	0.00	0.47	9.78	0.51	0.00	4.15	4.15	705.00	59.29	0.00
20/01/1965	-14.8	0	5	5	51.80	0.00	0.00	0.22	9.82	0.25	0.00	4.15	4.15	705.00	59.29	0.00
21/01/1965	-11.3	0	3.8	3.8	55.40	0.00	0.00	0.28	9.86	0.29	0.00	4.15	4.15	705.00	59.29	0.00
22/01/1965	-7	0	0.4	0.4	55.80	0.00	0.00	0.44	9.90	0.49	0.00	4.15	4.15	705.00	59.29	0.00
23/01/1965	-4.8	0	2.4	2.4	58.20	0.00	0.00	0.50	9.94	0.55	0.00	4.15	4.15	705.00	59.29	0.00
24/01/1965	-3.5	0	5	5	63.20	0.00	0.00	0.52	9.98	0.59	0.00	4.15	4.15	705.00	59.29	0.00
25/01/1965	-3	0	0	0	63.20	0.00	0.00	0.55	10.02	0.61	0.00	4.15	4.15	705.00	59.29	0.00
26/01/1965	-2.8	0	0	0	63.20	0.00	0.00	0.29	10.06	0.33	0.00	4.15	4.15	705.00	59.29	0.00
27/01/1965	-5.8	0	0.2	0.2	63.40	0.00	0.00	0.47	10.10	0.53	0.00	4.15	4.15	705.00	59.29	0.00
28/01/1965	-3	0	0	0	63.40	0.00	0.00	0.55	10.14	0.62	0.00	4.15	4.15	705.00	59.29	0.00
29/01/1965	-5.8	0	0	0	63.40	0.00	0.00	0.44	10.18	0.50	0.00	4.15	4.15	705.00	59.29	0.00
30/01/1965	-6.5	0	0	0	63.40	0.00	0.00	0.47	10.22	0.53	0.00	4.15	4.15	705.00	59.29	0.00
31/01/1965	-5.5	0	1	1	64.40	0.00	0.00	0.47	10.26	0.53	0.00	4.15	4.15	705.00	59.29	0.00
01/02/1965	-4	0	0.4	0.4	64.80	0.00	0.00	0.52	10.30	0.60	0.00	4.15	4.15	705.00	59.29	0.00
02/02/1965	-6.8	0	5	5	69.80	0.00	0.00	0.29	10.34	0.34	0.00	4.15	4.15	705.00	59.29	0.00
03/02/1965	-14	0	0	0	69.80	0.00	0.00	0.23	10.38	0.28	0.00	4.15	4.15	705.00	59.29	0.00
04/02/1965	-14.3	0	0	0	69.80	0.00	0.00	0.22	10.42	0.27	0.00	4.15	4.15	705.00	59.29	0.00
05/02/1965	-10.9	0	8	8	77.80	0.00	0.00	0.27	10.46	0.32	0.00	4.15	4.15	705.00	59.29	0.00
06/02/1965	-9.2	0	2	2	78.00	0.00	0.00	0.44	10.50	0.52	0.00	4.15	4.15	705.00	59.29	0.00
07/02/1965	-9	0	7	7	86.80	0.00	0.00	0.41	10.54	0.48	0.00	4.15	4.15	705.00	59.29	0.00
08/02/1965	-12.3	0	4.8	4.8	91.80	0.00	0.00	0.25	10.58	0.30	0.00	4.15	4.15	705.00	59.29	0.00
09/02/1965	-11.3	0	0	0	91.80	0.00	0.00	0.26	10.62	0.32	0.00	4.15	4.15	705.00	59.29	0.00
10/02/1965	-7.5	0	0	0	91.80	0.00	0.00	0.41	10.66	0.49	0.00	4.15	4.15	705.00	59.29	0.00
11/02/1965	-7	0	6.4	6.4	97.00	0.00	0.00	0.58	10.70	0.68	0.00	4.15	4.15	705.00	59.29	0.00
12/02/1965	-11.5	0	0.4	0.4	97.40	0.00	0.00	0.58	10.74	0.69	0.00	4.15	4.15	705.00	59.29	0.00
13/02/1965	0.5	0	3	3	100.40	0.00	0.00	0.61	10.78	0.70	0.00	4.15	4.15	705.00	59.29	0.00
14/02/1965	-5.5	0	12	12	112.40	0.00	0.00	0.47	10.82	0.68	0.00	4.15	4.15	705.00	59.29	0.00
15/02/1965	-7.9	0	5.4	5.4	117.80	0.00	0.00	0.41	10.86	0.60	0.00	4.15	4.15	705.00	59.29	0.00
16/02/1965	-8.8	0	0	0	117.80	0.00	0.00	0.44	10.90	0.59	0.00	4.15	4.15	705.00	59.29	0.00
17/02/1965	-2.5	0	0	0	117.80	0.00	0.00	0.55	10.94	0.67	0.00	4.15	4.15	705.00	59.29	0.00
18/02/1965	-2.8	0	0.4	0.4	118.20	0.00	0.00	0.55	10.98	0.67	0.00	4.15	4.15	705.00	59.29	0.00
19/02/1965	-5.3	0	0	0	118.20	0.00	0.00	0.47	11.02	0.67	0.00	4.15	4.15	705.00	59.29	0.00
20/02/1965	-5	0	0	0	118.20	0.00	0.00	0.50	11.06	0.61	0.00	4.15	4.15	705.00	59.29	0.00
21/02/1965	-1.3	3.2	0	3.2	118.20	0.00	0.00	0.58	11.10	0.71	2.49	4.15	8.64	1128.84	0.00	6.84
22/02/1965	4.5	1.1	0	1.1	118.20	24.54	24.54	0.81	11.14	0.87	34.56	4.15	45.35	7709.80	0.00	45.35
23/02/1965	6.5	20.0	0	20.0	93.00	27.28	27.28	0.87	11.18	1.04	48.84	4.15	96.33	18376.63	0.00	96.33
24/02/1965	7	2.4	0	2.4	66.38	31.39	31.39	1.00	11.22	1.20	32.80	4.15	133.98	22623.72	0.00	133.98
25/02/1965	1.8	0.2	0	0.2	34.89	17.13	17.13	0.99	11.26	0.89	16.53	4.15	153.78	26139.49	0.00	153.78
26/02/1965	0	4.9	0.2	5.1	19.09	0.00	0.00	0.61	11.30	0.75	4.99	4.15	161.65	27631.55	0.00	161.65
27/02/1965	-2.5	0	0	0	19.09	0.00	0.00	0.55	11.34	0.69	0.00	4.15	165.10	28236.55	0.00	165.10
28/02/1965	-3.5	0	0	0	19.09	0.00	0.00	0.52	11.38	0.66	0.00	4.15	170.24	28941.55	59.29	110.95
01/03/1965	3.8	2.8	0	2.8	19.09	22.82	19.09	0.76	11.42	0.83	19.93	4.15	135.03	22824.41	0.00	135.03
02/03/1965	2.8	0	0	0	0.00	19.87	0.00	0.71	11.46	0.87	0.00	4.15	139.17	23659.41	0.00	139.17
03/03/1965	-2.5	0	1.2	1.2	0.00	0.00	0.00	0.55	11.50	0.70	0.00	4.15	143.32	24584.41	29.65	114.87
04/03/1965	-1.5	19.8	6.5	26.3	2.79	0.00	0.00	0.59	11.54	0.74	19.99	4.15	155.88	23199.20	0.00	155.88
05/03/1965	-0.8	0	0.4	0.4	3.10	0.00	0.00	0.58	11.58	0.74	0.00	4.15	160.03	23805.20	0.00	160.03
06/03/1965	-5.8	0	0	0	3.10	0.00	0.00	0.47	11.62	0.61	0.00	4.15	164.18	24510.20	29.65	114.53
07/03/1965	-1.5	2.3	0	2.3	3.10	0.00	0.00	0.58	11.66	0.74	1.96	4.15	120.23	20439.70	0.00	120.23
08/03/1965	2.8	0.4	0	0.4	3.10	19.87	3.10	0.71	11.70	0.89	7.81	4.15	131.99	22438.10	0.00	131.99
09/03/1965	0	0	0	0	0.00	0.00	0.00	0.81	11.74	0.78	0.00	4.15	136.14	23143.10	0.00	136.14
10/03/1965	1.5	0	0	0	0.00	19.51	0.00	0.69	11.78	0.84	0.00	4.15	140.29	23848.10	29.65	110.54
11/03/1965	5.5	6.3	0	6.3	0.00	27.28	0.00	0.87	11.82	1.10	5.20	4.15	119.88	20398.79	0.00	119.88
12/03/1965	2.3	6.8	0	6.8	0.00	19.05	0.00	0.71	11.86	0.80	6.80	4.15	130.02	22103.85	0.00	130.02
13/03/1965	0.5	1	0	1	0.00	0.00	0.00	0.81	11.90	0.79	0.21	4.15	134.38	22844.48	0.00	134.38
14/03/19																

Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province: ONTARIO
 Latitude: 42.88
 Longitude: -79.23
 Elevation: 175.3
 Climate I: 6136006
 WMO Identifier:
 TC Identifier:

Max. Allowable Release: Summer, Wnter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
 705 m³/day
 4.15 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 284.33 mm
 48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/04/1965	2	0	0	0	0.00	17.66	0.00	0.71	12.59	0.95	0.00	4.15	95.31	18372.20	0.00	95.31
02/04/1965	0	0	0	0	0.00	0.00	0.00	0.81	12.83	0.84	0.00	4.15	100.45	17077.20	0.00	100.45
03/04/1965	1.5	1.8	0	1.8	0.00	16.31	0.00	0.86	12.80	0.90	0.70	4.15	103.30	17306.81	0.00	103.30
04/04/1965	5.3	8	0	8	0.00	26.73	0.00	0.87	12.99	1.18	0.82	4.15	115.28	16784.48	0.00	115.28
05/04/1965	11.8	2	0	2	0.00	44.58	0.00	0.91	13.79	1.76	0.25	4.15	120.89	20512.87	0.00	120.89
06/04/1965	4.5	0.2	0	0.2	0.00	24.54	0.00	0.81	12.76	1.11	0.00	4.15	124.81	21217.87	0.00	124.81
07/04/1965	3	1	0.8	1.8	0.80	20.42	0.80	0.76	12.80	1.05	0.75	4.15	128.71	22050.77	0.00	128.71
08/04/1965	2	0	0	0	0.00	17.69	0.00	0.71	12.83	0.98	0.00	4.15	133.66	22755.77	0.00	133.66
09/04/1965	-1.8	0	0	0	0.00	0.00	0.00	0.58	12.88	0.82	0.00	4.15	138.00	23460.77	29.65	109.28
10/04/1965	-0.5	2.4	0	2.4	0.00	0.00	0.00	0.59	12.90	0.82	1.58	4.15	144.08	19384.33	0.00	144.08
11/04/1965	3	0	0	0	0.00	25.81	0.00	0.87	12.93	1.21	0.00	4.15	118.23	20899.33	0.00	118.23
12/04/1965	3.5	0.2	0	0.2	0.00	21.79	0.00	0.79	12.87	1.05	0.00	4.15	122.33	20804.33	29.65	92.73
13/04/1965	11.5	0	0	0	0.00	43.74	0.00	1.21	13.00	1.79	0.00	4.15	98.88	18489.33	29.65	67.23
14/04/1965	11.3	0	0	0	0.00	43.19	0.00	1.31	13.00	1.79	0.00	4.15	71.38	12134.33	29.65	41.73
15/04/1965	15	0	0	0	0.00	63.94	0.00	1.71	13.07	2.30	0.00	4.15	45.88	7799.33	29.65	16.23
16/04/1965	13.8	0	0	0	0.00	60.05	0.00	1.60	13.10	2.04	0.00	4.15	20.38	3464.33	29.65	0.00
17/04/1965	9	0	0	0	0.00	20.42	0.00	0.79	13.14	1.07	0.00	4.15	4.15	705.00	29.65	0.00
18/04/1965	9.5	0	0	0	0.00	35.25	0.00	1.15	13.17	1.69	0.00	4.15	4.15	705.00	29.65	0.00
19/04/1965	8	32.8	0	32.8	0.00	34.14	0.00	1.07	13.20	1.50	31.30	4.15	35.45	6026.75	0.00	35.45
20/04/1965	10.6	0.4	0	0.4	0.00	41.00	0.00	1.23	13.24	1.71	0.00	4.15	39.59	6739.75	0.00	39.59
21/04/1965	12.5	0	0	0	0.00	46.48	0.00	1.40	13.27	1.94	0.00	4.15	43.74	7435.75	29.65	14.08
22/04/1965	13.3	0	0	0	0.00	48.68	0.00	1.50	13.31	2.07	0.00	4.15	18.24	3108.75	29.65	0.00
23/04/1965	19	0	0	0	0.00	81.87	0.00	2.69	13.34	2.82	0.00	4.15	4.15	705.00	29.65	0.00
24/04/1965	18.8	0	0	0	0.00	59.28	0.00	1.82	13.37	2.60	0.00	4.15	4.15	705.00	29.65	0.00
25/04/1965	7.8	0	0	0	0.00	33.59	0.00	1.00	13.41	1.42	0.00	4.15	4.15	705.00	29.65	0.00
26/04/1965	6.5	0	0	0	0.00	35.51	0.00	1.07	13.44	1.53	0.00	4.15	4.15	705.00	29.65	0.00
27/04/1965	8	1.2	0	1.2	0.00	24.14	0.00	1.07	13.48	1.53	0.00	4.15	4.15	705.00	0.00	4.15
28/04/1965	7.5	0	0	0	0.00	32.77	0.00	1.00	13.51	1.44	0.00	4.15	8.29	1410.00	0.00	8.29
29/04/1965	7.3	0	0	0	0.00	32.22	0.00	1.00	13.55	1.44	0.00	4.15	12.44	2115.00	29.65	0.00
30/04/1965	11.3	0	0	0	0.00	45.85	0.00	1.40	13.58	1.90	0.00	4.15	4.15	705.00	29.65	0.00
01/05/1965	9.5	0	0	0	0.00	38.25	0.00	1.15	13.61	1.65	0.00	4.15	4.15	705.00	29.65	0.00
02/05/1965	11	0	0	0	0.00	42.37	0.00	1.21	13.65	1.88	0.00	4.15	4.15	705.00	29.65	0.00
03/05/1965	10.8	0	0	0	0.00	41.82	0.00	1.23	13.68	1.76	0.00	4.15	4.15	705.00	29.65	0.00
04/05/1965	8.3	0	0	0	0.00	34.96	0.00	1.07	13.72	1.56	0.00	4.15	4.15	705.00	29.65	0.00
05/05/1965	11.5	12	0	12	0.00	43.74	0.00	1.21	13.75	1.89	10.11	4.15	14.28	2424.09	0.00	14.28
06/05/1965	10.5	3.9	0	3.9	0.00	41.60	0.00	1.23	13.79	1.78	2.12	4.15	20.53	3468.81	0.00	20.53
07/05/1965	10.8	0	0	0	0.00	41.82	0.00	1.23	13.82	1.78	0.00	4.15	24.68	4184.81	0.00	24.68
08/05/1965	6.8	0	0	0	0.00	30.85	0.00	0.84	13.85	1.38	0.00	4.15	28.82	4899.81	29.65	0.00
09/05/1965	10.8	0	0	0	0.00	41.82	0.00	1.23	13.89	1.79	0.00	4.15	4.15	705.00	29.65	0.00
10/05/1965	18.5	0	0	0	0.00	67.45	0.00	1.82	13.92	2.60	0.00	4.15	4.15	705.00	29.65	0.00
11/05/1965	18.5	2	0	2	0.00	62.84	0.00	2.08	13.95	2.84	0.00	4.15	4.15	705.00	0.00	4.15
12/05/1965	20.2	0.4	0	0.4	0.00	59.43	0.00	2.34	13.99	3.32	0.00	4.15	8.29	1410.00	0.00	8.29
13/05/1965	14.8	0	0	0	0.00	43.74	0.00	1.60	14.02	2.32	0.00	4.15	12.44	2115.00	29.65	0.00
14/05/1965	18.5	0	0	0	0.00	67.45	0.00	1.82	14.06	2.63	0.00	4.15	4.15	705.00	29.65	0.00
15/05/1965	15.8	2	0	2	0.00	55.53	0.00	1.71	14.09	2.48	0.00	4.15	4.15	705.00	0.00	4.15
16/05/1965	15.3	0.8	0	0.8	0.00	54.16	0.00	1.71	14.12	2.49	0.00	4.15	8.29	1410.00	0.00	8.29
17/05/1965	14	0.4	0	0.4	0.00	50.80	0.00	1.60	14.16	2.35	0.00	4.15	12.44	2115.00	0.00	12.44
18/05/1965	9.3	5.2	0	5.2	0.00	37.70	0.00	1.15	14.18	1.72	3.48	4.15	20.07	3411.83	0.00	20.07
19/05/1965	19	1.7	0	1.7	0.00	59.82	0.00	1.22	14.23	1.84	0.00	4.15	24.22	4118.83	0.00	24.22
20/05/1965	17.3	6.8	0	6.8	0.00	59.85	0.00	1.84	14.26	2.83	3.97	4.15	32.33	5495.88	0.00	32.33
21/05/1965	12	0	0	0	0.00	45.11	0.00	1.40	14.29	2.09	0.00	4.15	36.48	6205.88	0.00	36.48
22/05/1965	12	0	0	0	0.00	45.11	0.00	1.40	14.33	2.10	0.00	4.15	40.62	6905.88	29.65	10.98
23/05/1965	15	0	0	0	0.00	63.24	0.00	1.71	14.36	2.53	0.00	4.15	15.12	2579.88	29.65	0.00
24/05/1965	16	0	0	0	0.00	58.28	0.00	1.82	14.40	2.99	0.00	4.15	4.15	705.00	29.65	0.00
25/05/1965	18.3	0.8	0	0.8	0.00	59.61	0.00	1.82	14.45	2.70	0.00	4.15	4.15	705.00	0.00	4.15
26/05/1965	15.5	0.8	0	0.8	0.00	54.71	0.00	1.71	14.46	2.55	0.00	4.15	8.29	1410.00	0.00	8.29
27/05/1965	19	5	0	5	0.00	56.08	0.00	1.82	14.50	2.72	2.28	4.15	14.73	2503.27	0.00	14.73
28/05/1965	14.5	0	0	0	0.00	51.87	0.00	1.60	14.53	2.41	0.00	4.15	18.87	3208.27	0.00	18.87
29/05/1965	14.3	0	0	0	0.00	51.42	0.00	1.60	14.57	2.41	0.00	4.15	23.02	3813.27	29.65	0.00
30/05/1965	16.3	17.8	0	17.8	0.00	56.91	0.00	1.82	14.60	2.73	15.07	4.15	19.21	3268.50	0.00	19.21
31/05/1965	18.8	38.8	0	38.8	0.00	63.78	0.00	2.08	14.63	3.08	33.72	4.15	37.68	6705.44	0.00	37.68
01/06/1965	14.5	0	0	0	0.00	51.87	0.00	1.60	14.67	2.43	0.00	4.15	81.22	10409.44	0.00	81.22
02/06/1965	17.3	0	0	0	0.00	59.85	0.00	1.84	14.70	2.92	0.00	4.15	85.37	11113.44	59.29	6.08
03/06/1965	15	0	0	0	0.00	53.24	0.00	1.71	14.74	2.80	0.00	4.15	10.23	1738.44	59.29	0.00
04/06/1965	15.3	0.2	0	0.2	0.00	54.71	0.00	1.71	14.77	2.80	0.00	4.15	4.15	705.00	59.29	0.00
05/06/1965	18.8	0	0	0	0.00	58.28	0.00	1.82	14.81	2.77	0.00	4.15	4.15	705.00	59.29	0.00
06/06/1965	15	0	0	0	0.00	53.24	0.00	1.71	14.84	2.82	0.00	4.15	4.15	705.00	59.29	0.00
07/06/1965	18.5	0	0	0	0.00	67.45	0.00	1.82	14.87	2.78	0.00	4.15	4.15	705.00	59.29	0.00
08/06/1965	19.5	1.8	0	1.8	0.00	64.31	0.00	2.00	14.91	3.34	0.00	4.15	4.15	705.00	0.00	4.15
09/06/1965	20	0	0	0	0.00	67.00	0.00	2.34	14.94	3.55	0.00	4.15	8.29	1410.00	0.00	8.29
10/06/1965	16	0	0	0	0.00	56.08	0.00	1.82	14.98	2.81	0.00	4.15	12.44	2115.00	59.29	0.00
11/06/1965	15.3	28.8	0	28.8	0.00	54.16	0.00	1.71	15.01	2.84	28.10	4.15	30.30	6151.50	0.00	30.30</

Running Daily Water Balance, Raeb Quarry - Phase 1A
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.23
 Elevation 175.3
 Climate IC 8136006
 WMO Identifier
 TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
 705 m³/day
 4.15 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 284.33 mm
 48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
30/06/1965	19.6	0	0	0	0.00	65.68	0.00	2.20	15.04	3.39	0.00	4.15	4.15	705.00	59.29	0.00
01/07/1965	20	0	0	0	0.00	67.06	0.00	2.34	15.01	3.87	0.00	4.15	4.15	705.00	59.29	0.00
02/07/1965	20.8	0	0	0	0.00	69.25	0.00	2.34	14.97	3.35	0.00	4.15	4.15	705.00	59.29	0.00
03/07/1965	21.3	0	0	0	0.00	70.82	0.00	2.49	14.94	3.78	0.00	4.15	4.15	705.00	59.29	0.00
04/07/1965	22.8	0	0	0	0.00	74.74	0.00	2.64	14.90	3.92	0.00	4.15	4.15	705.00	59.29	0.00
05/07/1965	22.8	11.4	0	11.4	0.00	74.74	0.00	2.64	14.87	3.85	7.44	4.15	11.59	1079.19	0.00	11.59
06/07/1965	20.6	0.4	0	0.4	0.00	69.26	0.00	2.34	14.83	3.52	0.00	4.15	15.74	2678.19	0.00	15.74
07/07/1965	17.3	11.8	0	11.8	0.00	59.85	0.00	1.94	14.80	2.94	8.86	4.15	28.74	4888.03	0.00	28.74
08/07/1965	20.3	7.2	0	7.2	0.00	67.88	0.00	2.34	14.76	3.51	3.69	4.15	36.58	6218.07	0.00	36.58
09/07/1965	22.8	0.6	0	0.6	0.00	74.74	0.00	2.64	14.73	3.92	0.00	4.15	49.73	8924.07	0.00	49.73
10/07/1965	21.3	0.2	0	0.2	0.00	70.82	0.00	2.49	14.70	3.70	0.00	4.15	44.86	7829.07	0.00	44.86
11/07/1965	19.3	3.8	0	3.8	0.00	62.36	0.00	2.05	14.66	3.09	0.71	4.15	49.73	8454.16	0.00	49.73
12/07/1965	19.5	0.4	0	0.4	0.00	65.68	0.00	2.20	14.63	3.27	0.00	4.15	53.88	9159.16	0.00	53.88
13/07/1965	23.6	8.4	0	8.4	0.00	78.66	0.00	2.81	14.59	4.12	2.28	4.15	60.31	10252.01	0.00	60.31
14/07/1965	22.8	3.8	0	3.8	0.00	74.74	0.00	2.64	14.56	3.86	0.00	4.15	64.45	10957.01	0.00	64.45
15/07/1965	22.3	1.8	0	1.8	0.00	73.37	0.00	2.64	14.52	3.87	0.00	4.15	68.60	11662.01	0.00	68.60
16/07/1965	18.8	1	0	1	0.00	69.81	0.00	2.29	14.49	3.74	0.00	4.15	72.75	12367.01	0.00	72.75
17/07/1965	18.8	0	0	0	0.00	63.78	0.00	2.06	14.45	3.04	0.00	4.15	76.89	13072.01	0.00	76.89
18/07/1965	20	0	0	0	0.00	67.06	0.00	2.34	14.42	3.43	0.00	4.15	81.04	13777.01	0.00	81.04
19/07/1965	22.5	1	0	1	0.00	73.91	0.00	2.64	14.39	3.83	0.00	4.15	85.19	14482.01	0.00	85.19
20/07/1965	22.3	0	0	0	0.00	73.37	0.00	2.64	14.35	3.83	0.00	4.15	90.04	15187.01	0.00	90.04
21/07/1965	20.6	0	0	0	0.00	68.43	0.00	2.34	14.32	3.40	0.00	4.15	94.19	15892.01	0.00	94.19
22/07/1965	19.3	0	0	0	0.00	65.14	0.00	2.20	14.28	3.20	0.00	4.15	98.34	16597.01	0.00	98.34
23/07/1965	17.3	0	0	0	0.00	59.85	0.00	1.94	14.25	2.83	0.00	4.15	102.49	17302.01	0.00	102.49
24/07/1965	21.8	0	0	0	0.00	71.99	0.00	2.49	14.21	3.67	0.00	4.15	106.64	18007.01	0.00	106.64
25/07/1965	20	0	0	0	0.00	63.52	0.00	2.38	14.18	4.75	0.00	4.15	110.79	18712.01	0.00	110.79
26/07/1965	24.5	0.6	0	0.6	0.00	79.40	0.00	2.99	14.15	4.23	0.00	4.15	114.94	19417.01	0.00	114.94
27/07/1965	20.3	0	0	0	0.00	67.88	0.00	2.34	14.11	3.35	0.00	4.15	119.09	20122.01	0.00	119.09
28/07/1965	20	0	0	0	0.00	67.06	0.00	2.34	14.08	3.35	0.00	4.15	123.24	20827.01	0.00	123.24
29/07/1965	24.3	2	0	2	0.00	87.99	0.00	3.00	14.04	4.20	0.00	4.15	127.39	21532.01	0.00	127.39
30/07/1965	21.6	1	0	1	0.00	71.99	0.00	2.49	14.01	3.52	0.00	4.15	131.54	22237.01	0.00	131.54
31/07/1965	17.5	3.8	0	3.8	0.00	60.20	0.00	1.84	13.97	2.78	1.02	4.15	135.69	22942.01	0.00	135.69
01/08/1965	19	0	0	0	0.00	64.31	0.00	2.20	13.94	3.12	0.00	4.15	139.84	23647.01	0.00	139.84
02/08/1965	19.5	0	0	0	0.00	65.88	0.00	2.20	13.90	3.11	0.00	4.15	143.99	24352.01	0.00	143.99
03/08/1965	19.3	0	0	0	0.00	65.14	0.00	2.20	13.87	3.10	0.00	4.15	148.14	25057.01	0.00	148.14
04/08/1965	21.3	0	0	0	0.00	70.82	0.00	2.49	13.84	3.49	0.00	4.15	152.29	25762.01	0.00	152.29
05/08/1965	24	0	0	0	0.00	78.03	0.00	2.99	13.80	4.12	0.00	4.15	156.44	26467.01	0.00	156.44
06/08/1965	24	17.2	0	17.2	0.00	78.03	0.00	2.99	13.77	4.12	13.08	4.15	172.23	2928.54	0.00	172.23
07/08/1965	22.3	2	0	2	0.00	73.37	0.00	2.64	13.73	3.86	0.00	4.15	176.38	3833.54	0.00	176.38
08/08/1965	23.8	0	0	0	0.00	77.48	0.00	2.81	13.70	3.86	0.00	4.15	180.53	4338.54	0.00	180.53
09/08/1965	23	0	0	0	0.00	80.77	0.00	3.17	13.66	4.33	0.00	4.15	184.68	5043.54	0.00	184.68
10/08/1965	24	0	0	0	0.00	78.63	0.00	2.99	13.63	4.08	0.00	4.15	188.83	5948.54	0.00	188.83
11/08/1965	21.8	0	0	0	0.00	71.99	0.00	2.49	13.59	3.52	0.00	4.15	192.98	6853.54	0.00	192.98
12/08/1965	20.3	0	0	0	0.00	67.88	0.00	2.34	13.56	3.22	0.00	4.15	197.13	7758.54	0.00	197.13
13/08/1965	22	0	0	0	0.00	72.64	0.00	2.64	13.53	3.81	0.00	4.15	201.28	8663.54	0.00	201.28
14/08/1965	24.8	0	0	0	0.00	80.22	0.00	2.99	13.49	4.03	0.00	4.15	205.43	9568.54	0.00	205.43
15/08/1965	24	4.8	0	4.8	0.00	78.03	0.00	2.99	13.46	4.03	0.57	4.15	209.58	10473.54	0.00	209.58
16/08/1965	19.8	0	0	0	0.00	69.81	0.00	2.20	13.42	3.00	0.00	4.15	213.73	11378.54	0.00	213.73
17/08/1965	21.8	0	0	0	0.00	71.99	0.00	2.49	13.39	3.52	0.00	4.15	217.88	12283.54	0.00	217.88
18/08/1965	23.5	10.4	0	10.4	0.00	78.63	0.00	2.81	13.35	3.77	8.63	4.15	19.78	1833.31	0.00	10.78
19/08/1965	19.5	0	0	0	0.00	65.88	0.00	2.20	13.32	2.88	0.00	4.15	14.93	2537.31	0.00	14.93
20/08/1965	18.5	0	0	0	0.00	62.84	0.00	2.06	13.28	2.80	0.00	4.15	19.07	3242.31	0.00	19.07
21/08/1965	17.8	0	0	0	0.00	61.02	0.00	1.84	13.25	2.63	0.00	4.15	23.22	3947.31	0.00	23.22
22/08/1965	19	0	0	0	0.00	61.57	0.00	2.06	13.22	2.79	0.00	4.15	27.37	4652.31	0.00	27.37
23/08/1965	18.8	2.2	0	2.2	0.00	63.78	0.00	2.06	13.18	2.78	0.00	4.15	31.52	5357.31	0.00	31.52
24/08/1965	19.8	31.2	0	31.2	0.00	65.81	0.00	2.20	13.15	2.84	28.26	4.15	36.56	6214.60	0.00	36.56
25/08/1965	21.5	0	0	0	0.00	71.17	0.00	2.49	13.11	3.30	0.00	4.15	40.70	6919.60	0.00	40.70
26/08/1965	22	2.8	0	2.8	0.00	72.64	0.00	2.64	13.08	3.49	0.00	4.15	44.85	7624.60	0.00	44.85
27/08/1965	19.8	0	0	0	0.00	69.81	0.00	2.20	13.04	2.91	0.00	4.15	48.99	8329.60	0.00	48.99
28/08/1965	21.5	0	0	0	0.00	71.17	0.00	2.49	13.01	3.27	0.00	4.15	53.14	9034.60	0.00	53.14
29/08/1965	19.8	0	0	0	0.00	63.78	0.00	2.06	12.97	2.73	0.00	4.15	57.29	9739.60	0.00	57.29
30/08/1965	19	8.8	0	8.8	0.00	64.31	0.00	2.20	12.94	2.90	5.99	4.15	10.95	1738.19	0.00	10.95
31/08/1965	15.3	0	0	0	0.00	54.18	0.00	1.71	12.91	2.27	0.00	4.15	14.19	2443.19	0.00	14.19
01/09/1965	16.8	2	0	2	0.00	58.28	0.00	1.82	12.87	2.40	0.00	4.15	18.34	3148.19	0.00	18.34
02/09/1965	22.5	0	0	0	0.00	73.91	0.00	2.64	12.84	3.42	0.00	4.15	22.49	3853.19	0.00	22.49
03/09/1965	21.8	0	0	0	0.00	71.99	0.00	2.49	12.80	3.22	0.00	4.15	26.64	4558.19	0.00	26.64
04/09/1965	23.8	0.4	0	0.4	0.00	77.48	0.00	2.81	12.77	3.80	0.00	4.15	30.79	5263.19	0.00	30.79
05/09/1965	24.8	3.2	0	3.2	0.00	82.72	0.00	2.99	12.73	3.92	0.00	4.15	34.94	5968.19	0.00	34.94
06/09/1965	23.8	0	0	0	0.00	77.48	0.00	2.81	12.70	3.58	0.00	4.15	39.09	6673.19	0.00	39.09
07/09/1965	24.5	4.4	0	4.4	0.00	79.40	0.00	2.99	12.66	3.75	0.82	4.15	13.06	2219.67	0.00	13.06
08/09/1965	23.8	0.4	0	0.4	0.00	77.48	0.00	2.81	12.63	3.56	0.00	4.15	17.20	2924.67	0.00	17.20
09/09/1965	22	2														

**Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate IC: 6136806
WMO Identifier:
TC Identifier:

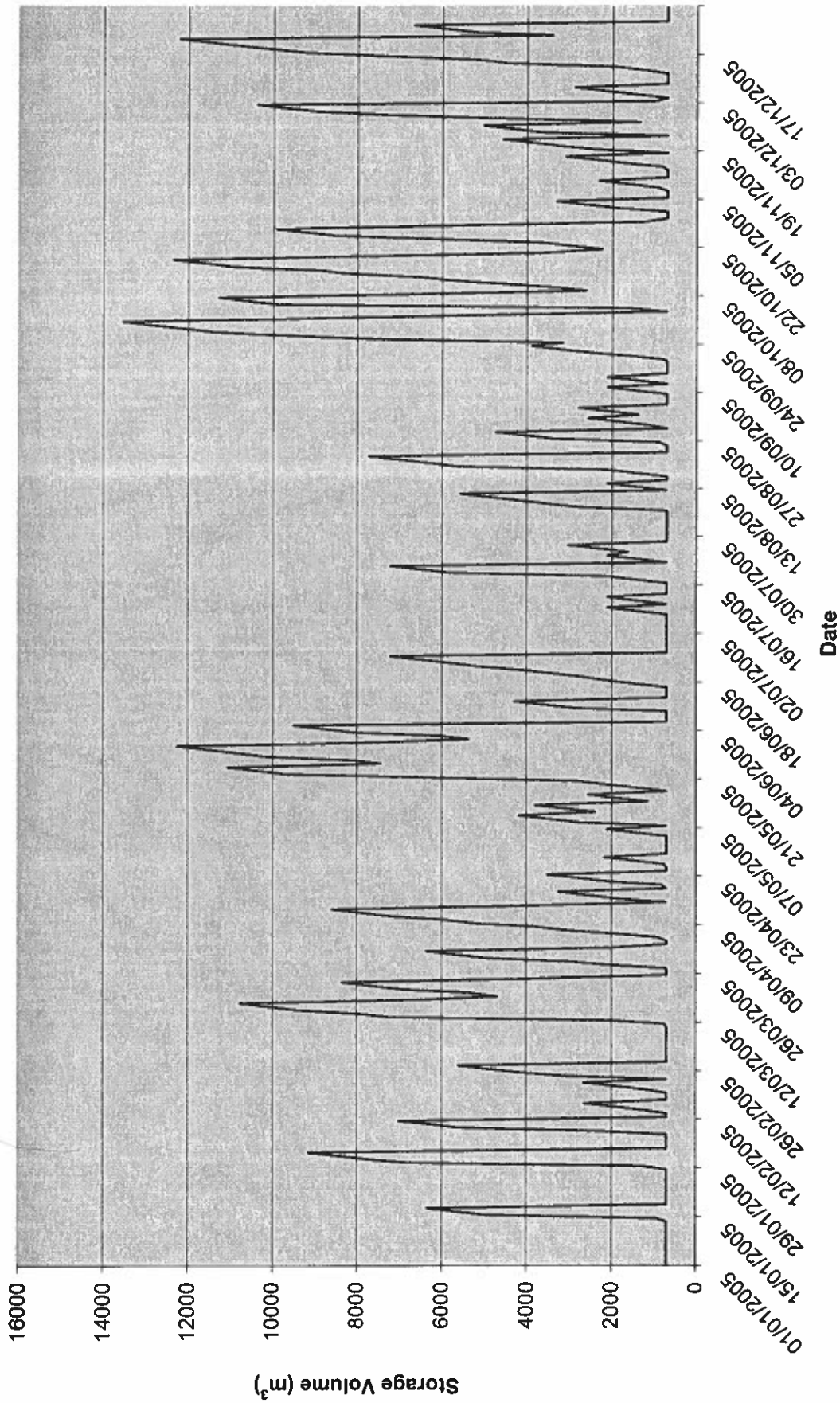
Max. Allowable Release: Summer, Winter 7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
705 m³/day
4.15 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 284.33 mm
48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (mm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
28/09/1965	13.6	0	0	0	0.00	50.05	0.00	1.50	11.97	1.86	0.00	4.15	41.63	7111.32	29.65	12.18
29/09/1965	19	0	0	0	0.00	64.31	0.00	2.20	11.94	2.87	0.00	4.15	16.33	2778.32	29.65	0.00
30/09/1965	18.6	1.8	0	1.8	0.00	63.78	0.00	2.08	11.91	2.51	0.00	4.15	4.15	705.00	0.00	4.15
01/10/1965	12.3	0.4	0	0.4	0.00	45.92	0.00	1.40	11.87	1.74	0.00	4.15	8.29	1416.00	0.00	8.29
02/10/1965	7.8	0	0	0	0.00	32.77	0.00	1.00	11.84	1.28	0.00	4.15	12.44	2119.00	29.65	0.00
03/10/1965	12	0	0	0	0.00	45.11	0.00	1.40	11.81	1.73	0.00	4.15	4.15	705.00	29.65	0.00
04/10/1965	15.3	1	0	1	0.00	54.16	0.00	1.71	11.78	2.08	0.00	4.15	4.15	705.00	0.00	4.15
05/10/1965	12.5	5.8	0	5.8	0.00	46.46	0.00	1.40	11.75	1.72	4.08	4.15	12.38	2103.76	0.00	12.38
06/10/1965	9.8	0	0	0	0.00	39.96	0.00	1.15	11.72	1.42	0.00	4.15	18.52	2806.76	0.00	18.52
07/10/1965	10.8	0	0	0	0.00	41.82	0.00	1.23	11.68	1.51	0.00	4.15	20.67	3513.76	29.65	0.00
08/10/1965	15.8	0	0	0	0.00	59.28	0.00	1.82	11.65	2.18	0.00	4.15	4.15	705.00	29.65	0.00
09/10/1965	17	0	0	0	0.00	58.63	0.00	1.94	11.63	2.31	0.00	4.15	4.15	705.00	29.65	0.00
10/10/1965	19	5.4	0	5.4	0.00	58.08	0.00	1.82	11.60	2.17	0.00	4.15	7.37	1253.68	0.00	7.37
11/10/1965	7.6	0	0	0	0.00	32.77	0.00	1.00	11.57	1.23	0.00	4.15	11.52	1958.68	0.00	11.52
12/10/1965	11	28.8	0	28.8	0.00	42.37	0.00	1.31	11.54	1.59	25.21	4.15	40.88	6949.93	0.00	40.88
13/10/1965	14.8	0	0	0	0.00	52.79	0.00	1.60	11.50	1.90	0.00	4.15	45.03	7554.93	0.00	45.03
14/10/1965	13.5	15	0	15	0.00	49.23	0.00	1.50	11.47	1.79	13.21	4.15	62.30	10899.40	0.00	62.30
15/10/1965	14.3	0	0	0	0.00	51.42	0.00	1.60	11.44	1.90	0.00	4.15	66.64	11311.40	0.00	66.64
16/10/1965	10.6	0	0	0	0.00	41.00	0.00	1.23	11.41	1.47	0.00	4.15	70.88	12018.40	29.65	41.04
17/10/1965	8.8	0	0	0	0.00	36.33	0.00	1.07	11.38	1.29	0.00	4.15	45.18	7861.40	29.65	15.54
18/10/1965	14.8	20	0	20	0.00	52.79	0.00	1.60	11.35	1.88	18.12	4.15	37.81	6427.26	0.00	37.81
19/10/1965	13.5	8.8	0	8.8	0.00	49.23	0.00	1.50	11.32	1.78	8.84	4.15	48.79	8284.79	0.00	48.79
20/10/1965	9.3	0	0	0	0.00	37.70	0.00	1.15	11.29	1.37	0.00	4.15	62.94	8996.79	0.00	62.94
21/10/1965	18.3	0	0	0	0.00	60.45	0.00	1.73	11.26	1.45	0.00	4.15	67.09	9794.79	29.65	27.44
22/10/1965	13.3	1.8	0	1.8	0.00	48.08	0.00	1.50	11.23	1.75	0.00	4.15	31.58	4389.79	0.00	31.58
23/10/1965	17.3	5.2	0	5.2	0.00	59.05	0.00	1.94	11.20	2.23	2.97	4.15	38.71	6580.42	0.00	38.71
24/10/1965	16	9.2	0	9.2	0.00	56.08	0.00	1.82	11.18	2.09	7.11	4.15	49.86	8493.83	0.00	49.86
25/10/1965	11.8	0	0	0	0.00	44.60	0.00	1.31	11.13	1.53	0.00	4.15	54.11	9198.85	0.00	54.11
26/10/1965	11.3	0	0	0	0.00	43.19	0.00	1.31	11.10	1.53	0.00	4.15	58.26	9903.85	29.65	28.61
27/10/1965	14.8	0	0	0	0.00	51.97	0.00	1.60	11.07	1.83	0.00	4.15	32.78	6569.85	29.65	3.11
28/10/1965	4.8	0	0	0	0.00	25.36	0.00	0.81	11.04	0.95	0.00	4.15	7.39	1233.85	29.65	0.00
29/10/1965	6.8	0	0	0	0.00	25.36	0.00	0.81	11.01	0.95	0.00	4.15	4.15	705.00	29.65	0.00
30/10/1965	4.5	0	0	0	0.00	30.02	0.00	0.84	10.98	1.09	0.00	4.15	4.15	705.00	29.65	0.00
31/10/1965	10.5	0	0	0	0.00	41.00	0.00	1.23	10.95	1.41	0.00	4.15	4.15	705.00	29.65	0.00
01/11/1965	13.5	0	0	0	0.00	49.23	0.00	1.50	10.92	1.70	0.00	4.15	4.15	705.00	29.65	0.00
02/11/1965	11.8	19	0	19	0.00	44.56	0.00	1.31	10.89	1.49	17.81	4.15	21.65	3881.12	0.00	21.65
03/11/1965	9.8	28.8	0	28.8	0.00	36.98	0.00	1.15	10.86	1.31	27.39	4.15	53.09	6025.01	0.00	53.09
04/11/1965	11.3	78.2	0	78.2	0.00	43.19	0.00	1.31	10.83	1.49	78.71	4.15	133.85	22771.12	0.00	133.85
05/11/1965	7.8	19.8	0	19.8	0.00	33.59	0.00	1.00	10.79	1.15	18.65	4.15	158.75	29847.12	0.00	158.75
06/11/1965	6	9.2	0	9.2	0.00	34.14	0.00	1.07	10.76	1.22	0.00	4.15	180.89	27352.12	0.00	180.89
07/11/1965	9	1.4	0	1.4	0.00	36.89	0.00	1.15	10.73	1.30	0.10	4.15	185.14	28073.83	0.00	185.14
08/11/1965	0.3	1.4	0	1.4	0.00	29.47	0.00	0.84	10.70	1.07	0.33	4.15	189.62	28835.56	0.00	189.62
09/11/1965	7.2	24.4	0	24.4	0.00	32.22	0.00	1.00	10.67	1.14	23.28	4.15	197.03	33495.45	0.00	197.03
10/11/1965	5.5	19	0	19	0.00	27.28	0.00	0.97	10.64	0.99	9.21	4.15	219.18	35731.80	0.00	219.18
11/11/1965	2	0.4	0	0.4	0.00	17.86	0.00	0.71	10.61	0.81	0.00	4.15	214.33	38438.80	0.00	214.33
12/11/1965	7.9	12.8	0	12.8	0.00	32.22	0.00	1.00	10.58	1.13	11.67	4.15	230.18	39120.38	0.00	230.18
13/11/1965	9	0	0	0	0.00	39.06	0.00	1.15	10.55	1.28	7.72	4.15	242.03	41144.60	0.00	242.03
14/11/1965	4.8	0	0	0	0.00	25.36	0.00	0.81	10.52	0.92	4.08	4.15	250.28	42543.70	0.00	250.28
15/11/1965	4.5	5	0	5	0.00	24.84	0.00	0.81	10.49	0.91	0.00	4.15	254.49	43248.79	0.00	254.49
16/11/1965	4.5	10	0	10	0.00	24.84	0.00	0.81	10.46	0.91	12.49	4.15	278.04	49029.72	0.00	278.04
17/11/1965	5.8	0	0	0	0.00	26.19	0.00	0.87	10.42	0.97	0.00	4.15	280.19	47833.72	0.00	280.19
18/11/1965	8.6	0	0	0	0.00	35.51	0.00	1.07	10.39	1.18	0.00	4.15	284.33	48336.72	29.65	254.69
19/11/1965	10.3	2	0	2	0.00	56.81	0.00	1.82	10.36	1.94	0.06	4.15	258.89	44012.06	0.00	258.89
20/11/1965	9.5	0	0	0	0.00	38.26	0.00	1.15	10.33	1.25	0.00	4.15	263.04	44717.06	0.00	263.04
21/11/1965	0.9	0	0	0	0.00	0.00	0.00	0.81	10.30	0.88	0.00	4.15	267.19	45422.06	29.65	237.54
22/11/1965	9.3	7.6	0	7.6	0.00	6.00	0.00	0.81	10.27	0.88	8.84	4.15	248.81	42282.89	0.00	248.81
23/11/1965	3.9	0	0	0	0.00	22.82	0.00	0.79	10.24	0.82	0.00	4.15	252.75	42987.89	0.00	252.75
24/11/1965	1	0	0	0	0.00	0.00	0.00	0.86	10.21	0.73	0.00	4.15	255.90	43672.89	29.65	227.25
26/11/1965	0.6	7.4	0	7.4	0.00	0.00	0.00	0.81	10.18	0.89	6.72	4.15	238.12	40480.88	0.00	238.12
28/11/1965	0.8	5.8	0	5.8	0.00	0.00	0.00	0.81	10.15	0.87	5.13	4.15	247.40	42057.30	0.00	247.40
27/11/1965	2.8	0	0	0	0.00	19.05	0.00	0.71	10.12	0.77	7.23	4.15	258.77	43991.07	0.00	258.77
28/11/1965	-0.3	0	0	0	0.00	0.00	0.00	0.58	10.09	0.84	0.00	4.15	262.82	44996.07	0.00	262.82
29/11/1965	0.8	0	0	0	0.00	0.00	0.00	0.81	10.05	0.87	0.00	4.15	267.07	45491.07	29.65	237.42
30/11/1965	4.3	0	0	0	0.00	23.99	0.00	0.81	10.02	0.86	0.00	4.15	241.57	41986.07	29.65	211.92
01/12/1965	7.8	0	0	0	0.00	33.59	0.00	1.00	9.99	1.06	0.00	4.15	218.07	38731.07	59.29	159.77
02/12/1965	-4.6	0	0	0	0.00	0.00	0.00	0.60	9.96	0.55	0.00	4.15	160.82	27358.07	59.29	101.62
03/12/1965	-5	0	0	0	0.00	0.00	0.00	0.50	9.93	0.65	0.00	4.15	105.77	17981.07	59.29	46.46
04/12/1965	-2.3	0	7.6	7.6	2.80	0.00	0.00	0.55	9.90	0.80	0.00	4.15	50.82	8805.07	59.29	0.00
05/12/1965	1.5	0	0	0	2.80	19.31	2.80	0.69	9.87	0.70	1.90	4.15	8.04	1027.42	0.00	8.04
06/12/1965	0.5	0	0	0	0.00	0.00	0.00	0.61	9.84	0.65	0.50	4.15	19.19	1733.42	0.00	19.19
07/12/1965	0.5	0	0	0	0.00	0.00	0.00	0.81	9.81	0.85	0.00	4.15	14.94	2437.42	59.29	0.00
08/12/1965	1	0	0	0	0.00	0.00	0.00	0.86	9.78	0.70	0.00					

**Storage Volumes - Phase 1A (Regular Groundwater Inflow)
2001 - Lowest Year Recorded**



**Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate Id: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter 7000 L/min
Spring, Fall 3500 L/min
0.125 m³/s 0.0625 m³/s
59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
705 m³/day
4.15 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 264.33 mm
48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/01/2001	-5.5	0	0	0	24.00	0.00	0.00	0.44	9.07	0.44	0.00	4.15	4.15	705.00	59.29	0.00
02/01/2001	-10.8	0	0	0	24.00	0.00	0.00	0.27	9.11	0.28	0.00	4.15	4.15	705.00	59.29	0.00
03/01/2001	-5	0	4	4	20.00	0.00	0.00	0.50	9.15	0.50	0.00	4.15	4.15	705.00	59.29	0.00
04/01/2001	-3.5	0	4	4	30.00	0.00	0.00	0.52	9.19	0.53	0.00	4.15	4.15	705.00	59.29	0.00
05/01/2001	-1.5	0	0	0	30.00	0.00	0.00	0.58	9.23	0.58	0.00	4.15	4.15	705.00	59.29	0.00
06/01/2001	-3	0	0	0	30.00	0.00	0.00	0.55	9.27	0.57	0.00	4.15	4.15	705.00	59.29	0.00
07/01/2001	-0.5	0	2	2	32.00	0.00	0.00	0.58	9.31	0.59	0.00	4.15	4.15	705.00	59.29	0.00
08/01/2001	-4	0	0	0	32.00	0.00	0.00	0.52	9.35	0.54	0.00	4.15	4.15	705.00	59.29	0.00
09/01/2001	-9.3	0	1	1	33.00	0.00	0.00	0.29	9.39	0.30	0.00	4.15	4.15	705.00	59.29	0.00
10/01/2001	-2.3	0	0	0	33.00	0.00	0.00	0.45	9.43	0.37	0.00	4.15	4.15	705.00	59.29	0.00
11/01/2001	-0.3	0	0	0	33.00	0.00	0.00	0.58	9.47	0.50	0.00	4.15	4.15	705.00	59.29	0.00
12/01/2001	0	0	0	0	33.00	0.00	0.00	0.81	9.51	0.83	0.00	4.15	4.15	705.00	59.29	0.00
13/01/2001	-2.5	0	0	0	33.00	0.00	0.00	0.55	9.55	0.58	0.00	4.15	4.15	705.00	59.29	0.00
14/01/2001	0.3	2	0	2	33.00	0.00	0.00	0.61	9.59	0.64	1.38	4.15	5.51	838.58	0.00	5.51
15/01/2001	2.5	1	0	1	33.00	19.05	19.05	0.71	9.63	0.73	18.32	4.15	28.97	4625.22	0.00	28.97
16/01/2001	0.5	0	0	0	14.85	0.00	0.00	0.81	9.67	0.84	0.00	4.15	33.12	5639.27	0.00	33.12
17/01/2001	-1	0	0	0	14.85	0.00	0.00	0.58	9.70	0.62	0.00	4.15	37.27	6333.22	0.00	37.27
18/01/2001	-0.3	0	0	0	14.85	0.00	0.00	0.58	9.74	0.62	0.00	4.15	4.15	705.00	59.29	0.00
19/01/2001	0	0	0	0	14.85	0.00	0.00	0.81	9.78	0.83	0.00	4.15	4.15	705.00	59.29	0.00
20/01/2001	-5.9	0	0	0	14.85	0.00	0.00	0.44	9.82	0.48	0.00	4.15	4.15	705.00	59.29	0.00
21/01/2001	-6.3	0	0	0	14.85	0.00	0.00	0.44	9.86	0.48	0.00	4.15	4.15	705.00	59.29	0.00
22/01/2001	-3.5	0	0	0	14.85	0.00	0.00	0.52	9.90	0.57	0.00	4.15	4.15	705.00	59.29	0.00
23/01/2001	-0.5	0	0	0	14.85	0.00	0.00	0.58	9.94	0.63	0.00	4.15	4.15	705.00	59.29	0.00
24/01/2001	-0.5	0	1	1	15.93	0.00	0.00	0.58	9.98	0.63	0.00	4.15	4.15	705.00	59.29	0.00
25/01/2001	-5	0	0	0	15.93	0.00	0.00	0.47	10.02	0.52	0.00	4.15	4.15	705.00	59.29	0.00
26/01/2001	-3	0	2	2	17.95	0.00	0.00	0.55	10.06	0.61	0.00	4.15	4.15	705.00	59.29	0.00
27/01/2001	-0.5	0	0	0	17.95	0.00	0.00	0.58	10.10	0.64	0.00	4.15	4.15	705.00	59.29	0.00
28/01/2001	-4.2	0	0	0	17.95	0.00	0.00	0.50	10.14	0.56	0.00	4.15	4.15	705.00	59.29	0.00
29/01/2001	-2.5	4	0	4	17.95	0.00	0.00	0.55	10.18	0.62	3.38	4.15	7.53	1279.58	0.00	7.53
30/01/2001	1.8	12	0	12	17.95	17.13	17.13	0.66	10.22	0.73	28.40	4.15	40.00	4812.88	0.00	40.00
31/01/2001	0.8	2	0	2	0.82	0.00	0.00	0.81	10.26	0.86	1.32	4.15	45.84	7742.01	0.00	45.84
01/02/2001	0.5	0	1	1	1.82	0.00	0.00	0.81	10.30	0.88	0.00	4.15	49.00	8447.01	0.00	49.00
02/02/2001	-2.8	0	0	0	1.82	0.00	0.00	0.55	10.34	0.63	0.00	4.15	53.84	9152.01	0.00	53.84
03/02/2001	-9.9	0	0	0	1.82	0.00	0.00	0.44	10.38	0.51	0.00	4.15	4.15	705.00	59.29	0.00
04/02/2001	-3	0	0	0	1.82	0.00	0.00	0.65	10.42	0.64	0.00	4.15	4.15	705.00	59.29	0.00
05/02/2001	0.5	0	0.5	0.5	0.00	0.00	0.00	0.81	10.46	0.70	0.00	4.15	4.15	705.00	59.29	0.00
06/02/2001	0.8	0	2	2	4.32	0.00	0.00	0.81	10.50	0.70	0.00	4.15	4.15	705.00	59.29	0.00
07/02/2001	1	0	0	0	4.32	0.00	0.00	0.86	10.54	0.75	0.00	4.15	4.15	705.00	59.29	0.00
08/02/2001	1	11	0	11	4.32	0.00	0.00	0.86	10.68	0.78	10.24	4.15	14.39	2446.55	0.00	14.39
09/02/2001	5.3	11	0	11	4.32	26.73	4.32	0.87	10.62	0.99	14.33	4.15	32.87	5587.62	0.00	32.87
10/02/2001	-4.3	0	0	0	0.00	0.00	0.00	0.50	10.66	0.59	0.00	4.15	37.01	6292.62	0.00	37.01
11/02/2001	-8.5	0	0	0	0.00	0.00	0.00	0.44	10.70	0.52	0.00	4.15	41.19	6997.62	0.00	41.19
12/02/2001	-3.5	0	0	0	0.00	0.00	0.00	0.52	10.74	0.62	0.00	4.15	4.15	705.00	59.29	0.00
13/02/2001	0	0	0	0	0.00	0.00	0.00	0.81	10.78	0.72	0.00	4.15	4.15	705.00	59.29	0.00
14/02/2001	0	3.8	4	7.8	4.00	0.00	0.00	0.81	10.82	0.72	3.08	4.15	7.23	1228.42	0.00	7.23
15/02/2001	-3.3	0	0	0	4.00	0.00	0.00	0.62	10.86	0.63	0.00	4.15	11.37	1833.47	0.00	11.37
16/02/2001	-3	0	0	0	4.00	0.00	0.00	0.55	10.90	0.67	0.00	4.15	15.52	2639.47	0.00	15.52
17/02/2001	-5.8	0	0	0	4.00	0.00	0.00	0.44	10.84	0.54	0.00	4.15	4.15	705.00	59.29	0.00
18/02/2001	-2.3	0	0	0	4.00	0.00	0.00	0.41	10.88	0.50	0.00	4.15	4.15	705.00	59.29	0.00
19/02/2001	-1.1	0	0	0	4.00	0.00	0.00	0.58	11.02	0.70	0.00	4.15	4.15	705.00	59.29	0.00
20/02/2001	2.8	0	0	0	4.00	18.87	4.00	0.71	11.09	0.84	3.16	4.15	7.30	1241.67	0.00	7.30
21/02/2001	-5.5	0	0	0	0.00	0.00	0.00	0.47	11.10	0.59	0.00	4.15	11.45	1846.67	0.00	11.45
22/02/2001	-8.8	0	2	2	2.00	0.00	0.00	0.44	11.14	0.65	0.00	4.15	15.60	2651.67	0.00	15.60
23/02/2001	-1.8	0	0	0	2.00	0.00	0.00	0.39	11.18	0.62	0.00	4.15	4.15	705.00	59.29	0.00
24/02/2001	-3	15	0	15	2.00	0.00	0.00	0.55	11.22	0.68	14.32	4.15	19.49	3138.81	0.00	19.49
25/02/2001	4.5	1	0	1	2.00	24.54	2.00	0.81	11.26	0.88	2.62	4.15	24.63	4189.81	0.00	24.63
26/02/2001	0.5	0	0	0	0.00	0.00	0.00	0.81	11.30	0.76	0.00	4.15	28.77	4991.81	0.00	28.77
27/02/2001	-0.3	0	0	0	0.00	0.00	0.00	0.58	11.34	0.72	0.00	4.15	32.92	5598.81	0.00	32.92
28/02/2001	-4.2	0	0	0	0.00	0.00	0.00	0.50	11.38	0.63	0.00	4.15	4.15	705.00	59.29	0.00
01/03/2001	-4.5	0	12	12	12.00	0.00	0.00	0.59	11.42	0.63	0.00	4.15	4.15	705.00	29.65	0.00
02/03/2001	-1	0	0	0	0.00	0.00	0.00	0.58	11.46	0.72	0.00	4.15	4.15	705.00	29.65	0.00
03/03/2001	0.5	0	0	0	12.00	0.00	0.00	0.41	11.50	0.56	0.00	4.15	4.15	705.00	29.65	0.00
04/03/2001	-2.5	0	5	5	17.00	0.00	0.00	0.55	11.54	0.70	0.00	4.15	4.15	705.00	29.65	0.00
05/03/2001	-3.3	0	6	6	23.00	0.00	0.00	0.52	11.58	0.67	0.00	4.15	4.15	705.00	29.65	0.00
06/03/2001	-3.5	0	0	0	23.00	0.00	0.00	0.52	11.62	0.67	0.00	4.15	4.15	705.00	29.65	0.00
07/03/2001	-2.8	0	0	0	23.00	0.00	0.00	0.55	11.66	0.71	0.00	4.15	4.15	705.00	29.65	0.00
08/03/2001	-0.8	0	2	2	28.00	0.00	0.00	0.58	11.70	0.74	0.00	4.15	4.15	705.00	29.65	0.00
09/03/2001	-2	0	0	0	25.00	0.00	0.00	0.58	11.74	0.75	0.00	4.15	4.15	705.00	29.65	0.00
10/03/2001	-1.5	0	2	2	27.00	0.00	0.00	0.58	11.78	0.75	0.00	4.15	4.15	705.00	29.65	0.00
11/03/2001	-1.5	1	0	1	27.00	0.00	0.00	0.58	11.82	0.75	0.25	4.15	4.39	746.79	0.00	4.39
12/03/2001	-2.5	3.8	0	3.8	27.00	0.00	0.00	0.55	11.86	0.72	3.08	4.15	11.82	1874.96	0.00	11.82
13/03/2001	3.8	8	0	8	27.00	21.79	21.79	0.79	11.90	0.87	20.82	4.15	42.59	7239.79	0.00	42.59
14/03/2001	1	0	0	0	5.21	0.00	0.00	0.59	11.84	0.63	0.00	4.15	48.73	7844.79	0.00	48.73
15/03/2001	4	0	0	0	0.00	0.00	0.00	0.81	11.88	1.05	4.18	4.15	55			

Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.25
 Elevation 175.3
 Climate k 8136606
 WMO Identifier
 TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
 705 m³/day
 4.15 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 284.33 mm
 48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
30/08/2001	24.5	0	0	0	0.00	79.40	0.00	2.09	15.04	4.49	0.00	4.15	4.15	705.00	59.29	0.00
01/09/2001	19	0	0	0	0.00	64.31	0.00	2.20	15.01	3.39	0.00	4.15	4.15	705.00	59.29	0.00
02/09/2001	17.5	0	0	0	0.00	49.48	0.00	1.40	14.97	2.19	0.00	4.15	4.15	705.00	59.29	0.00
03/09/2001	17.9	0	0	0	0.00	51.02	0.00	1.84	14.94	2.89	0.00	4.15	4.15	705.00	59.29	0.00
04/09/2001	21.8	0	0	0	0.00	21.96	0.00	2.49	14.90	3.74	0.00	4.15	4.15	705.00	59.29	0.00
05/09/2001	19.5	0	0	0	0.00	85.68	0.00	2.20	14.87	3.33	0.00	4.15	4.15	705.00	59.29	0.00
06/09/2001	19.8	0	0	0	0.00	55.53	0.00	1.71	14.83	2.81	0.00	4.15	4.15	705.00	59.29	0.00
07/09/2001	21.5	2.8	0	2.8	0.00	71.17	0.00	2.49	14.80	3.72	0.00	4.15	4.15	705.00	59.29	0.00
08/09/2001	23.5	0	0	0	0.00	78.95	0.00	2.81	14.76	4.17	0.00	4.15	4.15	1410.00	59.29	0.00
09/09/2001	21.8	0	0	0	0.00	71.99	0.00	2.49	14.73	3.70	0.00	4.15	12.44	2115.00	59.29	0.00
10/09/2001	22	2.8	0	2.8	0.00	76.29	0.00	2.81	14.70	4.15	0.00	4.15	4.15	705.00	59.29	0.00
11/09/2001	19.3	0	0	0	0.00	82.39	0.00	2.08	14.66	3.09	0.00	4.15	8.29	1410.00	59.29	0.00
12/09/2001	18	0	0	0	0.00	61.57	0.00	2.08	14.63	3.09	0.00	4.15	12.44	2115.00	59.29	0.00
13/09/2001	18.3	0	0	0	0.00	67.39	0.00	2.08	14.59	3.08	0.00	4.15	4.15	705.00	59.29	0.00
14/09/2001	19.5	0	0	0	0.00	65.68	0.00	2.20	14.56	3.20	0.00	4.15	4.15	705.00	59.29	0.00
15/09/2001	20	0	0	0	0.00	67.69	0.00	2.34	14.52	3.45	0.00	4.15	4.15	705.00	59.29	0.00
16/09/2001	20.8	0.8	0	0.8	0.00	69.23	0.00	2.34	14.49	3.43	0.00	4.15	4.15	705.00	59.29	0.00
17/09/2001	21.3	0	0	0	0.00	70.82	0.00	2.49	14.45	3.84	0.00	4.15	8.29	1410.00	59.29	0.00
18/09/2001	24	0	0	0	0.00	78.03	0.00	2.89	14.42	4.32	0.00	4.15	12.44	2115.00	59.29	0.00
19/09/2001	23.5	3.4	0	3.4	0.00	78.86	0.00	2.81	14.39	4.08	29.84	4.15	34.09	6784.78	59.29	34.08
20/09/2001	24.5	0	0	0	0.00	79.40	0.00	2.99	14.35	4.20	0.00	4.15	38.23	6499.78	59.29	38.23
21/09/2001	23.5	0	0	0	0.00	82.14	0.00	3.17	14.32	4.52	0.00	4.15	42.38	7204.78	59.29	42.38
22/09/2001	22.5	2.8	0	2.8	0.00	80.77	0.00	3.17	14.28	4.52	0.00	4.15	4.15	705.00	59.29	0.00
23/09/2001	25.5	0	0	0	0.00	82.14	0.00	3.17	14.25	4.50	0.00	4.15	8.29	1410.00	59.29	0.00
24/09/2001	24	0	0	0	0.00	83.52	0.00	3.36	14.21	4.78	0.00	4.15	12.44	2115.00	59.29	0.00
25/09/2001	24	9.8	0	9.8	0.00	78.03	0.00	2.89	14.18	4.24	5.39	4.15	9.50	1815.52	59.29	9.50
26/09/2001	20.3	0	0	0	0.00	67.88	0.00	2.34	14.15	3.36	0.00	4.15	13.65	2320.52	59.29	13.65
27/09/2001	19	0	0	0	0.00	64.31	0.00	2.20	14.11	3.10	0.00	4.15	17.80	3025.52	59.29	17.80
28/09/2001	20.8	0	0	0	0.00	69.23	0.00	2.34	14.08	3.34	0.00	4.15	4.15	705.00	59.29	0.00
29/09/2001	22.5	0	0	0	0.00	73.81	0.00	2.84	14.04	3.74	0.00	4.15	4.15	705.00	59.29	0.00
30/09/2001	22.5	0	0	0	0.00	73.81	0.00	2.84	14.01	3.73	0.00	4.15	4.15	705.00	59.29	0.00
31/09/2001	23.5	0	0	0	0.00	76.95	0.00	2.81	13.97	3.84	0.00	4.15	4.15	705.00	59.29	0.00
01/10/2001	25	0	0	0	0.00	80.77	0.00	3.17	13.94	4.41	0.00	4.15	4.15	705.00	59.29	0.00
02/10/2001	29	0	0	0	0.00	83.52	0.00	3.36	13.90	4.86	0.00	4.15	4.15	705.00	59.29	0.00
03/10/2001	24.5	0	0	0	0.00	79.40	0.00	2.99	13.87	4.14	0.00	4.15	4.15	705.00	59.29	0.00
04/10/2001	25.3	0	0	0	0.00	81.59	0.00	3.17	13.84	4.59	0.00	4.15	4.15	705.00	59.29	0.00
05/10/2001	24	0	0	0	0.00	80.22	0.00	2.99	13.80	4.12	0.00	4.15	4.15	705.00	59.29	0.00
06/10/2001	24	0	0	0	0.00	78.03	0.00	2.89	13.77	4.12	0.00	4.15	4.15	705.00	59.29	0.00
07/10/2001	20.5	16.6	0	16.6	0.00	84.89	0.00	3.36	13.73	4.59	12.01	4.15	16.16	2746.61	59.29	16.16
08/10/2001	25.8	0	0	0	0.00	82.87	0.00	3.17	13.70	4.32	0.00	4.15	20.30	3451.61	59.29	20.30
09/10/2001	27	0	0	0	0.00	88.26	0.00	3.57	13.66	4.84	0.00	4.15	24.45	4156.61	59.29	24.45
10/10/2001	25	0	0	0	0.00	80.77	0.00	3.17	13.63	4.31	0.00	4.15	28.60	4861.61	59.29	28.60
11/10/2001	21	0	0	0	0.00	69.80	0.00	2.49	13.59	3.09	0.00	4.15	32.74	5566.61	59.29	32.74
12/10/2001	21.5	1	0	1	0.00	71.17	0.00	2.49	13.56	3.41	0.00	4.15	4.15	705.00	59.29	0.00
13/10/2001	22	0.4	0	0.4	0.00	72.54	0.00	2.84	13.53	3.81	0.00	4.15	8.29	1410.00	59.29	8.29
14/10/2001	19.8	0	0	0	0.00	65.51	0.00	2.20	13.49	3.01	0.00	4.15	12.44	2115.00	59.29	12.44
15/10/2001	21.8	0	0	0	0.00	71.99	0.00	2.49	13.46	3.38	0.00	4.15	4.15	705.00	59.29	0.00
16/10/2001	23.5	2.4	0	2.4	0.00	76.95	0.00	2.81	13.42	3.79	0.00	4.15	4.15	705.00	59.29	0.00
17/10/2001	22	1	0	1	0.00	72.54	0.00	2.84	13.39	3.57	0.00	4.15	8.29	1410.00	59.29	8.29
18/10/2001	23.5	0	0	0	0.00	78.95	0.00	2.81	13.35	3.77	0.00	4.15	12.44	2115.00	59.29	12.44
19/10/2001	21.5	19.8	0	19.8	0.00	71.17	0.00	2.49	13.32	3.35	18.45	4.15	35.04	5616.58	59.29	35.04
20/10/2001	20.5	1.4	0	1.4	0.00	68.43	0.00	2.34	13.28	3.15	0.00	4.15	37.19	6321.58	59.29	37.19
21/10/2001	20.3	0	0	0	0.00	67.88	0.00	2.34	13.25	3.15	0.00	4.15	41.33	7026.58	59.29	41.33
22/10/2001	20.3	0	0	0	0.00	67.88	0.00	2.34	13.22	3.14	0.00	4.15	45.48	7731.58	59.29	45.48
23/10/2001	22.5	0	0	0	0.00	73.81	0.00	2.84	13.19	3.51	0.00	4.15	4.15	705.00	59.29	0.00
24/10/2001	22.5	0	0	0	0.00	73.81	0.00	2.84	13.16	3.50	0.00	4.15	4.15	705.00	59.29	0.00
25/10/2001	20.5	0	0	0	0.00	68.43	0.00	2.34	13.11	3.11	0.00	4.15	4.15	705.00	59.29	0.00
26/10/2001	24.5	5	0	5	0.00	79.40	0.00	2.99	13.08	3.81	1.09	4.15	5.24	890.89	59.29	5.24
27/10/2001	27	13.9	0	13.9	0.00	72.54	0.00	2.84	13.04	3.48	10.12	4.15	19.50	3315.84	59.29	19.50
28/10/2001	22.5	9.4	0	9.4	0.00	73.81	0.00	2.84	13.01	3.47	0.00	4.15	23.65	4020.84	59.29	23.65
29/10/2001	19.8	0	0	0	0.00	65.51	0.00	2.20	12.97	2.90	0.00	4.15	27.80	4725.84	59.29	27.80
30/10/2001	21.8	0	0	0	0.00	71.99	0.00	2.49	12.94	3.29	0.00	4.15	4.15	705.00	59.29	0.00
31/10/2001	22	8	0	8	0.00	72.54	0.00	2.84	12.91	3.44	2.58	4.15	9.70	1130.40	59.29	9.70
01/11/2001	16.8	0	0	0	0.00	58.28	0.00	1.82	12.87	2.40	0.00	4.15	13.85	1844.40	59.29	13.85
02/11/2001	16.8	0	0	0	0.00	57.45	0.00	1.82	12.84	2.40	0.00	4.15	15.00	2549.40	59.29	15.00
03/11/2001	20.8	7	0	7	0.00	69.23	0.00	2.34	12.80	3.03	3.97	4.15	8.11	1379.12	59.29	8.11
04/11/2001	18.5	0	0	0	0.00	71.17	0.00	2.49	12.77	3.21	0.00	4.15	12.20	2084.12	59.29	12.20
05/11/2001	21.5	0	0	0	0.00	80.77	0.00	3.17	12.74	3.59	0.00	4.15	16.41	2789.12	59.29	16.41
06/11/2001	18	0	0	0	0.00	61.57	0.00	2.08	12.70	2.98	0.00	4.15	4.15	705.00	59.29	0.00
07/11/2001	22	0	0	0	0.00	72.54	0.00	2.84	12.66	3.38	0.00	4.15	4.15	705.00	59.29	0.00
08/11/2001	26.5	0	0	0	0.00	84.89	0.00	3.36	12.63	4.22	0.00	4.15	4.15	705.00	59.29	0.00
09/11/2001	26.5	1	0	1	0.00	84.89	0.00	3.36	12.60	4.21	0.00	4.15	4.15	705.00	59.29	0.00
10/11/2001	21	0	0	0	0.00	69										

Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province: ONTARIO
 Latitude: 42.88
 Longitude: -79.25
 Elevation: 175.3
 Climate IC: 6136006
 WMO Identifier:
 TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
 705 m³/day
 4.15 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 284.33 mm
 48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
28/09/2001	13	2	0	2	0.00	47.85	0.00	1.59	11.87	1.87	0.13	4.15	71.39	12135.00	0.00	71.39
29/09/2001	12.5	0	0	0	0.00	46.46	0.00	1.40	11.94	1.75	0.00	4.15	75.54	12841.00	0.00	75.54
30/09/2001	12.8	0	0	0	0.00	47.30	0.00	1.40	11.81	1.74	0.00	4.15	79.68	13546.00	29.65	50.04
01/10/2001	17.8	0	0	0	0.00	47.83	0.00	1.50	11.87	1.85	0.00	4.15	84.18	14211.00	29.65	24.54
02/10/2001	19	0	0	0	0.00	56.06	0.00	1.82	13.84	2.22	0.00	4.15	28.68	4925.00	29.65	0.00
03/10/2001	20.6	0	0	0	0.00	68.43	0.00	2.34	11.81	2.60	0.00	4.15	4.15	705.00	29.65	0.00
04/10/2001	19	6.4	0	6.4	0.00	64.31	0.00	2.20	11.78	2.64	6.78	4.15	9.91	1684.22	0.00	9.91
05/10/2001	11.3	45.0	0	45.0	0.00	43.19	0.00	1.31	11.75	1.81	43.09	4.15	58.04	8868.71	0.00	58.04
06/10/2001	6.8	0	0	0	0.00	36.33	0.00	1.07	11.72	1.33	0.00	4.15	62.18	10571.71	0.00	62.18
07/10/2001	5.8	0	0	0	0.00	28.10	0.00	0.87	11.69	1.09	0.00	4.15	66.33	11278.71	29.65	36.69
08/10/2001	4.3	0	0	0	0.00	23.99	0.00	0.81	11.66	1.02	0.00	4.15	49.83	6943.71	29.65	11.18
09/10/2001	10.6	1	0	1	0.00	41.00	0.00	1.23	11.63	1.60	0.00	4.15	15.33	2698.71	0.00	15.33
10/10/2001	17.8	0	0	0	0.00	61.02	0.00	1.94	11.60	2.30	0.00	4.15	19.43	3311.71	0.00	19.43
11/10/2001	19	5.4	0	5.4	0.00	61.87	0.00	2.08	11.57	2.44	2.86	4.15	28.58	4519.41	0.00	28.58
12/10/2001	15.8	5.4	0	5.4	0.00	65.83	0.00	1.71	11.54	2.05	3.37	4.15	34.10	5787.61	0.00	34.10
13/10/2001	20	0	0	0	0.00	67.08	0.00	2.34	11.50	2.73	0.00	4.15	39.25	8902.61	0.00	39.25
14/10/2001	19	8.8	0	8.8	0.00	64.31	0.00	2.20	11.47	2.87	0.00	4.15	48.43	6234.69	0.00	48.43
15/10/2001	12.8	0	0	0	0.00	47.30	0.00	1.40	11.44	1.67	0.00	4.15	52.67	6937.69	0.00	52.67
16/10/2001	13.3	9.4	0	9.4	0.00	48.68	0.00	1.50	11.41	1.78	7.62	4.15	64.34	10938.47	0.00	64.34
17/10/2001	6.5	0	0	0	0.00	30.02	0.00	0.94	11.38	1.13	0.00	4.15	68.49	11843.47	0.00	68.49
18/10/2001	7.6	0	0	0	0.00	32.77	0.00	1.00	11.35	1.21	0.00	4.15	72.64	12348.47	29.65	42.99
19/10/2001	12	0	0	0	0.00	47.85	0.00	1.60	11.32	1.78	0.00	4.15	77.14	13013.47	29.65	17.46
20/10/2001	12	0	0	0	0.00	49.11	0.00	1.40	11.29	1.65	0.00	4.15	81.64	13728.47	29.65	0.00
21/10/2001	15	11	0	11	0.00	53.34	0.00	1.71	11.26	1.98	9.04	4.15	13.18	12313.47	0.00	13.18
22/10/2001	19.8	0.6	0	0.6	0.00	41.82	0.00	1.23	11.23	1.45	0.00	4.15	17.31	2842.67	0.00	17.31
23/10/2001	14	1.8	0	1.8	0.00	50.80	0.00	1.60	11.20	1.86	0.00	4.15	21.46	3647.67	0.00	21.46
24/10/2001	17	13	0	13	0.00	58.83	0.00	1.94	11.16	2.22	19.78	4.15	39.38	6184.64	0.00	39.38
25/10/2001	9	11	0	11	0.00	36.88	0.00	1.15	11.13	1.35	9.85	4.15	50.18	8520.39	0.00	50.18
26/10/2001	6	0	0	0	0.00	28.85	0.00	0.84	11.10	1.11	0.00	4.15	54.33	9235.39	0.00	54.33
27/10/2001	4.5	0	0	0	0.00	24.84	0.00	0.81	11.07	0.97	0.00	4.15	58.47	9949.39	29.65	28.83
28/10/2001	5.8	0	0	0	0.00	28.10	0.00	0.87	11.04	1.03	0.00	4.15	62.67	5903.39	29.65	3.33
29/10/2001	8	0	0	0	0.00	36.88	0.00	1.15	11.01	1.33	0.00	4.15	7.47	1270.39	29.65	0.00
30/10/2001	6.6	0	0	0	0.00	30.02	0.00	0.94	10.99	1.09	0.00	4.15	4.15	705.00	29.65	0.00
31/10/2001	9.3	0	0	0	0.00	37.70	0.00	1.15	10.95	1.33	0.00	4.15	4.15	705.00	29.65	0.00
01/11/2001	14.3	0.2	0	0.2	0.00	61.42	0.00	1.80	10.92	1.81	0.00	4.15	4.15	705.00	29.65	0.00
02/11/2001	14.5	8.8	0	8.8	0.00	51.87	0.00	1.60	10.89	1.80	7.00	4.15	11.14	1084.65	0.00	11.14
03/11/2001	10.5	0	0	0	0.00	41.00	0.00	1.23	10.86	1.40	0.00	4.15	15.29	2588.65	0.00	15.29
04/11/2001	10.5	0	0	0	0.00	41.00	0.00	1.23	10.83	1.40	0.00	4.15	19.44	3304.65	29.65	0.00
05/11/2001	5.8	0	0	0	0.00	27.28	0.00	0.87	10.79	1.01	0.00	4.15	4.15	705.00	29.65	0.00
06/11/2001	4.8	0	0	0	0.00	25.36	0.00	0.81	10.76	0.84	0.00	4.15	4.15	705.00	29.65	0.00
07/11/2001	11.5	0	0	0	0.00	43.74	0.00	1.31	10.73	1.47	0.00	4.15	4.15	705.00	29.65	0.00
08/11/2001	12.3	2.8	0	2.8	0.00	45.11	0.00	1.40	10.70	1.57	1.23	4.15	5.38	814.37	0.00	5.38
09/11/2001	5	0	0	0	0.00	26.81	0.00	0.87	10.67	1.00	0.00	4.15	8.53	1319.37	0.00	8.53
10/11/2001	7.8	0	0	0	0.00	33.59	0.00	1.00	10.64	1.13	0.00	4.15	13.67	2324.37	29.65	0.00
11/11/2001	2.3	0	0	0	0.00	18.50	0.00	0.71	10.61	0.81	0.00	4.15	4.15	705.00	29.65	0.00
12/11/2001	4.3	0	0	0	0.00	23.99	0.00	0.81	10.58	0.82	0.00	4.15	4.15	705.00	29.65	0.00
13/11/2001	7	0	0	0	0.00	31.39	0.00	1.00	10.55	1.12	0.00	4.15	4.15	705.00	29.65	0.00
14/11/2001	10.5	2	0	2	0.00	41.00	0.00	1.23	10.52	1.36	0.84	4.15	4.79	814.40	0.00	4.79
15/11/2001	12.3	2	0	2	0.00	45.83	0.00	1.40	10.49	1.54	0.86	4.15	9.69	1363.43	0.00	9.69
16/11/2001	12.8	0	0	0	0.00	47.30	0.00	1.40	10.46	1.53	0.00	4.15	14.05	2388.43	0.00	14.05
17/11/2001	6.8	0	0	0	0.00	30.02	0.00	0.84	10.42	1.04	0.00	4.15	18.20	3093.43	29.65	0.00
18/11/2001	7.8	0	0	0	0.00	33.59	0.00	1.00	10.39	1.10	0.00	4.15	4.15	705.00	29.65	0.00
19/11/2001	11.5	11.8	0	11.8	0.00	43.74	0.00	1.31	10.36	1.42	10.18	4.15	14.32	2435.00	0.00	14.32
20/11/2001	2.9	0.8	0	0.8	0.00	18.50	0.00	0.71	10.33	0.79	0.01	4.15	18.48	3141.88	0.00	18.48
21/11/2001	4	0	0	0	0.00	23.18	0.00	0.81	10.30	0.89	0.00	4.15	22.63	3646.88	0.00	22.63
22/11/2001	8	0	0	0	0.00	34.14	0.00	1.07	10.27	1.17	0.00	4.15	26.78	4531.88	29.65	0.00
23/11/2001	10.6	0	0	0	0.00	41.00	0.00	1.23	10.24	1.32	0.00	4.15	4.15	705.00	29.65	0.00
24/11/2001	11.8	18.6	0	18.6	0.00	44.56	0.00	1.31	10.21	1.40	17.10	4.15	21.25	3611.84	0.00	21.25
25/11/2001	13	0	0	0	0.00	47.85	0.00	1.60	10.18	1.59	0.00	4.15	25.39	4318.84	0.00	25.39
26/11/2001	8.3	0.2	0	0.2	0.00	34.98	0.00	1.07	10.15	1.15	0.00	4.15	29.84	4921.84	29.65	0.00
27/11/2001	8	8	0	8	0.00	38.88	0.00	1.16	10.12	1.23	3.77	4.15	7.82	1346.82	0.00	7.82
28/11/2001	5.8	14.8	0	14.8	0.00	28.10	0.00	0.87	10.09	0.84	13.88	4.15	28.93	4407.85	0.00	28.93
29/11/2001	5	12.8	0	12.8	0.00	25.81	0.00	0.87	10.05	0.84	11.88	4.15	41.94	7129.22	0.00	41.94
30/11/2001	8.8	7.8	0	7.8	0.00	36.33	0.00	1.07	10.02	1.14	6.89	4.15	52.75	8957.01	0.00	52.75
01/12/2001	7.6	0.2	0	0.2	0.00	32.77	0.00	1.00	9.99	1.08	0.00	4.15	56.89	9872.01	0.00	56.89
02/12/2001	9	0	0	0	0.00	28.85	0.00	0.84	9.95	0.89	0.00	4.15	61.04	10377.01	59.29	1.75
03/12/2001	8	0	0	0	0.00	34.14	0.00	1.07	9.93	1.13	0.00	4.15	5.89	1002.01	59.29	0.00
04/12/2001	8.8	0.8	0	0.8	0.00	36.33	0.00	1.07	9.89	1.12	0.00	4.15	4.15	705.00	0.00	4.15
05/12/2001	14	2	0	2	0.00	50.80	0.00	1.60	9.87	1.64	0.36	4.15	8.66	1471.72	0.00	8.66
06/12/2001	10.8	0	0	0	0.00	41.00	0.00	1.23	9.84	1.27	0.00	4.15	12.80	2178.72	0.00	12.80
07/12/2001	5.3	0	0	0	0.00	26.72	0.00	0.87	9.81	0.82	0.00	4.15	16.85	2881.72	59.29	0.00
08/12/2001	0.8	0	0	0	0.00	0.00	0.00	0.81	0.78	0.85	0.00	4.15	4.15	705.00	59.29	0.00
09/12/2001	3	0														

Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.25
 Elevation 175.3
 Climate k: 8136806
 WMO Identifier
 TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/e 0.0625 m³/e
 59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
 705 m³/day
 4.15 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 284.33 mm
 48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
27/12/2001	-4	0	20	20	79.50	0.00	0.00	0.52	9.19	0.53	0.00	4.15	4.15	705.00	59.29	0.00
28/12/2001	-2.5	0	9	9	88.50	0.00	0.00	0.55	9.16	0.58	0.00	4.15	4.15	705.00	59.29	0.00
29/12/2001	-4	0	0	0	95.50	0.00	0.00	0.52	9.13	0.53	0.00	4.15	4.15	705.00	59.29	0.00
30/12/2001	-4	0	9	9	83.50	0.00	0.00	0.52	9.10	0.53	0.00	4.15	4.15	705.00	59.29	0.00
31/12/2001	-5	0	0	0	83.50	0.00	0.00	0.50	9.07	0.50	0.00	4.15	4.15	705.00	59.29	0.00

**Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007**

Station #: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate Id: 8136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter 7000 L/min 3500 L/min
0.125 m³/a 0.0625 m³/a
59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
705 m³/day
4.15 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 284.33 mm
48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)	
01/01/2000	1.3	3	0	3	0.00	15.76	0.00	0.68	9.07	0.55	2.35	4.15	44.31	7522.99	0.00	44.31
02/01/2000	-4.2	0	8	8	8.00	0.00	0.50	0.67	0.52	0.00	4.15	48.46	8237.69	0.00	48.46	
03/01/2000	-3	0	7	7	15.00	0.00	0.52	0.11	0.54	0.00	4.15	52.60	8642.69	59.29	0.00	
04/01/2000	-0.2	0	2	2	15.00	0.00	0.56	0.12	0.28	0.00	4.15	56.75	9047.69	59.29	0.00	
05/01/2000	-2.5	0	2	2	17.00	0.00	0.55	0.15	0.19	0.00	4.15	60.90	9452.69	59.29	0.00	
06/01/2000	-2.5	0	17	17	34.00	0.00	0.52	0.25	0.22	0.00	4.15	65.05	9857.69	59.29	0.00	
07/01/2000	-5.8	0	7	7	41.00	0.00	0.47	0.27	0.48	0.00	4.15	69.20	10262.69	59.29	0.00	
08/01/2000	1	0	0	0	41.00	0.00	0.52	0.21	0.50	0.00	4.15	73.35	10667.69	59.29	0.00	
09/01/2000	2.5	1	2	3	41.00	19.05	19.05	0.71	0.32	0.71	19.34	4.15	23.49	3992.25	0.00	23.49
10/01/2000	-5.8	0	0	0	21.83	0.00	0.52	0.37	0.39	0.49	0.00	4.15	27.63	4587.25	0.00	27.63
11/01/2000	-7	0	0	0	21.83	0.00	0.52	0.44	0.43	0.59	0.00	4.15	31.78	5482.25	59.29	0.00
12/01/2000	-3.5	0	0	0	21.83	0.00	0.52	0.52	0.47	0.55	0.00	4.15	35.93	6377.25	59.29	0.00
13/01/2000	-4	0	0	0	21.83	0.00	0.52	0.52	0.51	0.55	0.00	4.15	40.08	7272.25	59.29	0.00
14/01/2000	-8.8	0	0	0	21.83	0.00	0.52	0.44	0.55	0.47	0.00	4.15	44.23	8167.25	59.29	0.00
15/01/2000	-7.8	0	0	0	21.83	0.00	0.52	0.41	0.59	0.64	0.00	4.15	48.38	9062.25	59.29	0.00
16/01/2000	-7.3	0	0	0	21.83	0.00	0.52	0.41	0.63	0.64	0.00	4.15	52.53	9957.25	59.29	0.00
17/01/2000	-9.5	0	0	0	21.83	0.00	0.52	0.29	0.67	0.71	0.00	4.15	56.68	10852.25	59.29	0.00
18/01/2000	-10.8	0	0	0	21.83	0.00	0.52	0.27	0.70	0.70	0.00	4.15	60.83	11747.25	59.29	0.00
19/01/2000	-8	0	0	0	25.85	0.00	0.50	0.41	0.74	0.65	0.00	4.15	64.98	12642.25	59.29	0.00
20/01/2000	-9	0	0	0	25.85	0.00	0.50	0.38	0.78	0.62	0.00	4.15	69.13	13537.25	59.29	0.00
21/01/2000	-10.1	0	0	0	25.85	0.00	0.50	0.27	0.82	0.50	0.00	4.15	73.28	14432.25	59.29	0.00
22/01/2000	-12.3	0	0	0	25.85	0.00	0.50	0.25	0.86	0.28	0.00	4.15	77.43	15327.25	59.29	0.00
23/01/2000	-14.4	0	4	4	25.85	0.00	0.50	0.23	0.90	0.27	0.00	4.15	81.58	16222.25	59.29	0.00
24/01/2000	-13.5	0	0	0	30.87	0.00	0.50	0.26	0.94	0.30	0.00	4.15	85.73	17117.25	59.29	0.00
25/01/2000	-7	0	7	7	37.88	0.00	0.50	0.44	0.98	0.46	0.00	4.15	89.88	18012.25	59.29	0.00
26/01/2000	-7.6	0	8	8	45.88	0.00	0.50	0.41	10.02	0.48	0.00	4.15	94.03	18907.25	59.29	0.00
27/01/2000	-14.8	0	5	5	50.89	0.00	0.50	0.22	10.06	0.28	0.00	4.15	98.18	19802.25	59.29	0.00
28/01/2000	-9.2	0	5	5	55.91	0.00	0.50	0.36	10.10	0.42	0.00	4.15	102.33	20697.25	59.29	0.00
29/01/2000	-4.5	0	0	0	55.91	0.00	0.52	0.50	10.14	0.55	0.00	4.15	106.48	21592.25	59.29	0.00
30/01/2000	-11.1	0	0	0	55.91	0.00	0.52	0.40	10.18	0.39	0.00	4.15	110.63	22487.25	59.29	0.00
31/01/2000	-5.2	0	0	0	55.91	0.00	0.52	0.44	10.22	0.50	0.00	4.15	114.78	23382.25	59.29	0.00
01/02/2000	1.3	0	0	0	55.91	15.76	15.76	0.86	10.26	0.73	15.03	4.15	118.93	24277.25	0.00	19.17
02/02/2000	0.8	0	0	0	46.19	0.00	0.52	0.81	10.30	0.88	0.00	4.15	123.08	25172.25	0.00	23.32
03/02/2000	2.3	19	0	19	40.19	18.50	18.50	0.71	10.34	0.79	27.71	4.15	127.23	26067.25	0.00	55.16
04/02/2000	0	0	0	0	21.89	0.00	0.52	0.81	10.38	0.89	0.00	4.15	131.38	26962.25	0.00	89.31
05/02/2000	-5.8	0	0	0	21.89	0.00	0.52	0.47	10.42	0.54	0.00	4.15	135.53	27857.25	59.29	4.18
06/02/2000	-5	0	0	0	21.89	0.00	0.52	0.56	10.46	0.58	0.00	4.15	139.68	28752.25	59.29	0.00
07/02/2000	-5.8	0	0	0	21.89	0.00	0.52	0.47	10.50	0.55	0.00	4.15	143.83	29647.25	59.29	0.00
08/02/2000	-7.8	0	0	0	21.89	0.00	0.52	0.41	10.54	0.48	0.00	4.15	147.98	30542.25	59.29	0.00
09/02/2000	-5	0	0	0	21.89	0.00	0.52	0.50	10.58	0.50	0.00	4.15	152.13	31437.25	59.29	0.00
10/02/2000	-5.1	0	0	0	27.89	0.00	0.52	0.52	10.62	0.55	0.00	4.15	156.28	32332.25	59.29	0.00
11/02/2000	-12.5	0	12	12	36.89	0.00	0.52	0.23	10.66	0.30	0.00	4.15	160.43	33227.25	59.29	0.00
12/02/2000	-11	0	0	0	36.89	0.00	0.52	0.27	10.70	0.33	0.00	4.15	164.58	34122.25	59.29	0.00
13/02/2000	-13.3	0	0	0	36.89	0.00	0.52	0.23	10.74	0.29	0.00	4.15	168.73	35017.25	59.29	0.00
14/02/2000	-8	0	0	0	36.89	0.00	0.52	0.41	10.78	0.40	0.00	4.15	172.88	35912.25	59.29	0.00
15/02/2000	-11.8	0	0	0	36.89	0.00	0.52	0.28	10.82	0.32	0.00	4.15	177.03	36807.25	59.29	0.00
16/02/2000	-12.3	0	0	0	36.89	0.00	0.52	0.23	10.86	0.29	0.00	4.15	181.18	37702.25	59.29	0.00
17/02/2000	-9	0	12	12	32.89	0.00	0.52	0.38	10.90	0.47	0.00	4.15	185.33	38597.25	59.29	0.00
18/02/2000	-5	0	8	8	32.89	0.00	0.52	0.50	10.94	0.60	0.00	4.15	189.48	39492.25	59.29	0.00
19/02/2000	-1	0	0	0	32.89	0.00	0.52	0.55	10.98	0.70	0.00	4.15	193.63	40387.25	59.29	0.00
20/02/2000	-2	0	0	0	32.89	0.00	0.52	0.58	11.02	0.70	0.00	4.15	197.78	41282.25	59.29	0.00
21/02/2000	0.3	0	0	0	32.89	0.00	0.52	0.58	11.06	0.70	0.00	4.15	201.93	42177.25	59.29	0.00
22/02/2000	0.5	1	2	3	32.89	0.00	0.52	0.68	11.10	0.71	0.28	4.15	206.08	43072.25	0.00	4.44
23/02/2000	-4	1	1	2	32.89	0.00	0.52	0.47	11.14	0.58	0.00	4.15	210.23	43967.25	0.00	8.59
24/02/2000	-7.6	2	1.8	1.8	32.89	0.00	0.52	0.41	11.18	0.41	0.00	4.15	214.38	44862.25	59.29	0.00
25/02/2000	15.8	2	0	2	32.89	0.00	0.52	0.27	11.22	0.35	0.00	4.15	218.53	45757.25	59.29	0.00
26/02/2000	-11	2	0	2	32.89	0.00	0.52	0.27	11.26	0.35	0.00	4.15	222.68	46652.25	59.29	0.00
27/02/2000	-6.8	2	0	2	32.89	0.00	0.52	0.44	11.30	0.55	0.00	4.15	226.83	47547.25	59.29	0.00
28/02/2000	-3	0	0	0	32.89	0.00	0.52	0.55	11.34	0.69	0.00	4.15	230.98	48442.25	59.29	0.00
01/03/2000	-2	0	0	0	32.89	0.00	0.52	0.58	11.38	0.73	0.00	4.15	235.13	49337.25	59.29	0.00
02/03/2000	0.5	0	0	0	32.89	0.00	0.52	0.81	11.42	0.78	0.00	4.15	239.28	50232.25	59.29	0.00
03/03/2000	-12.1	0	0	0	32.89	0.00	0.52	0.25	11.46	0.32	0.00	4.15	243.43	51127.25	59.29	0.00
04/03/2000	-5.1	1	0	1	32.89	0.00	0.52	0.47	11.50	0.60	0.40	4.15	247.58	773.21	0.00	4.58
05/03/2000	-1.8	0	0	0	32.89	0.00	0.52	0.68	11.54	0.74	0.00	4.15	251.73	1478.21	0.00	8.79
06/03/2000	-5.8	0	0	0	32.89	0.00	0.52	0.47	11.58	0.60	0.00	4.15	255.88	2183.21	28.85	0.00
07/03/2000	-5	0	0	0	32.89	0.00	0.52	0.50	11.62	0.64	0.00	4.15	260.03	2888.21	28.85	0.00
08/03/2000	0.5	19	0	19	32.89	0.00	0.52	0.81	11.66	0.78	0.22	4.15	264.18	2273.21	0.00	13.37
09/03/2000	-8.5	0	0	0	32.89	0.00	0.52	0.28	11.70	0.40	0.00	4.15	268.33	2978.21	0.00	17.52
10/03/2000	-0.5	0	0	0	32.89	0.00	0.52	0.62	11.74	0.54	0.00	4.15	272.48	3683.21	28.85	0.00
11/03/2000	-3.5	0	0	0	32.89	0.00	0.52	0.52	11.78	0.68	0.00	4.15	276.63	4388.21	28.85	0.00
12/03/2000	-0.3	0	0	0	32.89	0.00	0.52	0.80	11.82	0.75	0.00	4.15	280.78	5093.21	28.85	0.00
13/03/2000	-3.8	0	0	0	32.89	0.00	0.52	0.52	11.86	0.69	0.00	4.15	284.93	5798.21	28.85	0.00
14/03/2000	-4.3	0	0	0	32.89	0.00	0.52	0.50	11.90	0.63	0.00	4.15	289.08	6503.21		

**Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate Ic 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter 7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
705 m³/day
4.15 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 284.33 mm
48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/04/2003	2.5	3	0	3	2.00	19.05	2.00	0.71	12.58	0.88	4.04	4.15	81.67	13880.73	0.00	81.67
02/04/2003	6.5	0	0	0	0.00	30.02	0.00	0.84	12.89	1.25	0.00	4.15	85.72	14571.73	0.00	85.72
03/04/2003	9.3	2	0	2	0.00	0.00	0.00	0.58	12.83	0.50	2.20	4.15	92.06	15260.34	0.00	92.06
04/04/2003	-1.5	2	0	2	0.00	0.00	0.00	0.58	12.98	0.81	1.19	4.15	97.69	15957.97	0.00	97.69
05/04/2003	-1	6	0	6	0.00	0.00	0.00	0.58	12.89	0.81	5.19	4.15	108.74	16745.48	0.00	108.74
06/04/2003	-2.8	0	0	0	0.00	0.00	0.00	0.55	12.73	0.78	0.00	4.15	110.89	18590.48	0.00	110.89
07/04/2003	-2	0	0	0	0.00	0.00	0.00	0.55	12.78	0.82	0.00	4.15	115.03	18555.48	29.65	85.39
08/04/2003	-1.3	0	0	0	0.00	0.00	0.00	0.58	12.80	0.82	0.00	4.15	89.53	15220.48	29.65	59.89
09/04/2003	1.5	0	0	0	0.00	18.31	0.00	0.66	12.83	0.81	8.09	4.15	72.12	12280.03	0.00	72.12
10/04/2003	4	0	0	0	0.00	22.18	0.00	0.81	12.88	1.12	0.00	4.15	78.28	12985.03	0.00	78.28
11/04/2003	7.3	0	0	0	0.00	32.22	0.00	1.00	12.80	1.37	0.00	4.15	80.41	13670.03	29.65	50.76
12/04/2003	6.3	0	0	0	0.00	29.47	0.00	0.94	12.83	1.29	0.00	4.15	84.91	8335.03	29.65	25.20
13/04/2003	3	0	0	0	0.00	20.42	0.00	0.78	12.87	1.05	0.00	4.15	29.41	5000.03	29.65	0.00
14/04/2003	6.6	0	0	0	0.00	35.81	0.00	1.07	13.00	1.48	0.00	4.15	4.15	705.00	29.65	0.00
15/04/2003	15	0	0	0	0.00	53.54	0.00	1.71	13.03	2.39	0.00	4.15	4.15	705.00	29.65	0.00
16/04/2003	8.8	0	0	0	0.00	36.33	0.00	1.07	13.07	1.48	0.00	4.15	4.15	705.00	29.65	0.00
17/04/2003	3	0	0	0	0.00	29.42	0.00	0.78	13.10	1.07	0.00	4.15	4.15	705.00	29.65	0.00
18/04/2003	9.8	0	0	0	0.00	39.08	0.00	1.15	13.14	1.59	0.00	4.15	4.15	705.00	29.65	0.00
19/04/2003	13.8	0	0	0	0.00	50.05	0.00	1.50	13.17	2.05	0.00	4.15	4.15	705.00	29.65	0.00
20/04/2003	18	2	0	2	0.00	60.06	0.00	1.82	13.20	2.47	0.00	4.15	4.15	705.00	0.00	4.15
21/04/2003	23	4	0	4	0.00	37.70	0.00	1.15	13.24	1.80	2.40	4.15	10.88	1817.48	0.00	10.88
22/04/2003	6.5	1	0	1	0.00	30.92	0.00	0.94	13.27	1.32	0.00	4.15	14.84	2322.48	0.00	14.84
23/04/2003	3.8	0	0	0	0.00	22.82	0.00	0.78	13.31	1.09	0.00	4.15	18.90	3227.48	0.00	18.90
24/04/2003	3.3	0	0	0	0.00	21.24	0.00	0.78	13.34	1.09	0.00	4.15	23.13	3622.48	29.65	0.00
25/04/2003	6.8	0	0	0	0.00	35.33	0.00	1.07	13.37	1.62	0.00	4.15	4.15	705.00	29.65	0.00
26/04/2003	8.6	0	0	0	0.00	38.28	0.00	1.15	13.41	1.82	0.00	4.15	4.15	705.00	29.65	0.00
27/04/2003	6.3	0	0	0	0.00	29.47	0.00	0.94	13.44	1.34	0.00	4.15	4.15	705.00	29.65	0.00
28/04/2003	13	0	0	0	0.00	47.63	0.00	1.50	13.48	2.10	0.00	4.15	4.15	705.00	29.65	0.00
29/04/2003	9.8	0	0	0	0.00	39.08	0.00	1.15	13.51	1.83	0.00	4.15	4.15	705.00	29.65	0.00
30/04/2003	10.6	17	0	17	0.00	41.00	0.00	1.23	13.55	1.75	15.25	4.15	19.40	3289.00	0.00	19.40
01/05/2003	15.8	21.6	0	21.6	0.00	65.63	0.00	1.71	13.58	2.39	18.11	4.15	42.66	7262.11	0.00	42.66
02/05/2003	10.9	1.4	0	1.4	0.00	41.00	0.00	1.23	13.61	1.78	0.00	4.15	46.81	7957.11	0.00	46.81
03/05/2003	10	0	0	0	0.00	39.82	0.00	1.23	13.65	1.78	0.00	4.15	50.95	8662.11	0.00	50.95
04/05/2003	12	0	0	0	0.00	45.11	0.00	1.40	13.68	2.00	0.00	4.15	58.10	9367.11	29.65	28.45
05/05/2003	11.3	19.2	0	19.2	0.00	43.19	0.00	1.31	13.72	1.98	17.32	4.15	14.84	882.48	0.00	14.84
06/05/2003	12.6	0	0	0	0.00	46.48	0.00	1.40	13.75	2.01	0.00	4.15	51.06	8680.71	0.00	51.06
07/05/2003	11.5	0	0	0	0.00	43.74	0.00	1.31	13.78	1.89	0.00	4.15	55.21	9385.71	29.65	25.56
08/05/2003	12.3	0	0	0	0.00	45.83	0.00	1.40	13.82	2.02	0.00	4.15	29.71	6059.71	29.65	0.00
09/05/2003	13.3	0	0	0	0.00	48.68	0.00	1.50	13.85	2.18	0.00	4.15	4.21	718.71	29.65	0.00
10/05/2003	18.5	0	0	0	0.00	67.45	0.00	1.82	13.89	2.80	0.00	4.15	4.15	705.00	0.00	4.15
11/05/2003	18.5	29	0	29	0.00	37.45	0.00	1.15	13.92	2.02	23.40	4.15	31.69	5387.47	0.00	31.69
12/05/2003	6.5	7	0	7	0.00	35.51	0.00	1.07	13.95	1.58	5.42	4.15	41.25	7013.21	0.00	41.25
13/05/2003	6.5	2.2	0	2.2	0.00	35.51	0.00	1.07	13.99	1.59	0.81	4.15	46.01	7822.30	0.00	46.01
14/05/2003	11	0	0	0	0.00	42.37	0.00	1.31	14.02	1.83	0.00	4.15	50.16	8527.30	0.00	50.16
15/05/2003	11.5	2.2	0	2.2	0.00	43.74	0.00	1.31	14.06	1.83	0.27	4.15	54.58	9278.18	0.00	54.58
16/05/2003	17	8.4	0	8.4	0.00	45.11	0.00	1.40	14.09	2.00	4.34	4.15	63.06	10720.18	0.00	63.06
17/05/2003	14.5	0	0	0	0.00	51.97	0.00	1.59	14.12	2.24	0.00	4.15	67.21	11425.18	0.00	67.21
18/05/2003	17	0	0	0	0.00	58.83	0.00	1.84	14.16	2.82	0.00	4.15	71.35	12130.18	29.65	41.71
19/05/2003	17	0	0	0	0.00	58.83	0.00	1.84	14.19	2.82	0.00	4.15	45.85	7795.15	29.65	16.21
20/05/2003	15.3	19	0	19	0.00	54.18	0.00	1.71	14.23	2.61	18.49	4.15	36.85	6264.17	0.00	36.85
21/05/2003	10.5	0.4	0	0.4	0.00	41.00	0.00	1.23	14.26	1.84	0.00	4.15	41.00	6989.17	0.00	41.00
22/05/2003	11.5	25	0	25	0.00	43.74	0.00	1.31	14.29	1.86	0.00	4.15	45.14	7874.17	29.65	15.50
23/05/2003	15	0	0	0	0.00	53.54	0.00	1.71	14.33	2.53	24.47	4.15	42.12	7199.70	0.00	42.12
24/05/2003	11.8	0.8	0	0.8	0.00	44.56	0.00	1.31	14.36	1.97	0.00	4.15	46.20	7844.70	0.00	46.20
25/05/2003	13.9	0	0	0	0.00	48.89	0.00	1.50	14.40	2.24	0.00	4.15	50.41	8599.70	0.00	50.41
26/05/2003	12.6	0	0	0	0.00	46.48	0.00	1.40	14.43	2.11	0.00	4.15	54.56	9274.70	29.65	24.91
27/05/2003	13	0	0	0	0.00	47.85	0.00	1.50	14.46	2.25	0.00	4.15	29.06	4939.70	29.65	0.00
28/05/2003	11.3	0	0	0	0.00	43.19	0.00	1.31	14.50	1.99	0.00	4.15	4.15	705.00	29.65	0.00
29/05/2003	14.5	5	0	5	0.00	51.97	0.00	1.60	14.53	2.41	2.59	4.15	8.74	1148.93	0.00	8.74
30/05/2003	14.5	1	0	1	0.00	51.97	0.00	1.60	14.57	2.41	0.00	4.15	10.89	1850.93	0.00	10.89
31/05/2003	12	20	0	20	0.00	47.85	0.00	1.50	14.60	2.20	17.72	4.15	32.78	5588.90	0.00	32.78
01/06/2003	11.8	0	0	0	0.00	44.56	0.00	1.31	14.63	2.01	0.00	4.15	36.91	6273.90	0.00	36.91
02/06/2003	11.3	0	0	0	0.00	43.19	0.00	1.31	14.67	2.02	0.00	4.15	41.05	6978.90	29.65	0.00
03/06/2003	12.3	0	0	0	0.00	45.93	0.00	1.40	14.70	2.15	0.00	4.15	4.15	705.00	29.65	0.00
04/06/2003	15	7	0	7	0.00	53.84	0.00	1.71	14.74	2.60	4.40	4.15	8.55	1458.27	0.00	8.55
05/06/2003	13	1	0	1	0.00	47.85	0.00	1.50	14.77	2.30	0.00	4.15	12.70	2188.27	0.00	12.70
06/06/2003	16.3	0	0	0	0.00	58.81	0.00	1.82	14.81	2.77	0.00	4.15	18.84	2883.27	0.00	18.84
07/06/2003	18.3	0	0	0	0.00	62.90	0.00	2.08	14.84	3.13	0.00	4.15	20.89	3588.27	29.65	0.00
08/06/2003	18.5	15	0	15	0.00	62.94	0.00	2.08	14.87	3.14	11.80	4.15	18.01	2721.86	0.00	18.01
09/06/2003	15.3	0.4	0	0.4	0.00	64.71	0.00	1.71	14.91	2.82	0.00	4.15	20.18	3428.86	0.00	20.18
10/06/2003	18.3	3.8	0	3.8	0.00	62.99	0.00	2.08	14.94	3.15	0.85	4.15	24.95	4241.80	0.00	24.95
11/06/2003	18	0	0	0	0.00	64.81	0.00	2.08	14.98	3.38	0.00	4.15	29.10	4846.80	0.00	29.10
12/06/2003	18.5	17	0	17	0.00	62.94	0.00	2.08</								

Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.25
 Elevation 175.3
 Climate k: 8136606
 WMO Identifier
 TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
 705 m³/day
 4.15 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 284.33 mm
 48337 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
30/08/2003	18	0	0	0	0.00	61.57	0.00	2.05	15.07	3.18	0.00	4.15	8.20	1410.00	0.00	8.20
31/08/2003	21.8	0	0	0	0.00	71.99	0.00	2.49	15.04	3.78	0.00	4.15	12.44	2115.00	59.29	0.00
02/09/2003	22	0	0	0	0.00	72.84	0.00	2.84	15.01	4.01	0.00	4.15	4.15	705.00	59.29	0.00
03/09/2003	24	0	0	0	0.00	78.03	0.00	2.89	14.97	4.48	0.00	4.15	4.15	705.00	59.29	0.00
04/09/2003	24.3	0	0	0	0.00	78.85	0.00	2.89	14.94	4.47	0.00	4.15	4.15	705.00	59.29	0.00
05/09/2003	22.3	8	0	8	0.00	73.37	0.00	2.64	14.90	3.87	4.03	4.15	8.17	1389.50	0.00	8.17
06/09/2003	23.5	1	0	1	0.00	76.66	0.00	2.81	14.87	4.20	0.00	4.15	12.32	2094.50	0.00	12.32
07/09/2003	22.5	0	0	0	0.00	73.91	0.00	2.84	14.83	3.85	0.00	4.15	16.47	2799.50	0.00	16.47
08/09/2003	23.3	1.8	0	1.8	0.00	76.11	0.00	2.81	14.80	4.18	0.00	4.15	20.61	3504.50	0.00	20.61
09/09/2003	21.3	0	0	0	0.00	70.87	0.00	2.48	14.76	3.72	0.00	4.15	24.76	4289.50	0.00	24.76
10/09/2003	19.5	31	0	31	0.00	65.68	0.00	2.20	14.72	3.29	27.71	4.15	58.81	9924.37	0.00	58.81
11/09/2003	20.5	4	0	4	0.00	68.43	0.00	2.34	14.70	3.49	0.81	4.15	61.27	10418.59	0.00	61.27
12/09/2003	18.5	1	0	1	0.00	62.84	0.00	2.06	14.66	3.00	0.00	4.15	65.42	11121.59	0.00	65.42
13/09/2003	19.5	0	0	0	0.00	65.58	0.00	2.20	14.63	3.27	0.00	4.15	69.57	11826.59	0.00	69.57
14/09/2003	22.8	0	0	0	0.00	73.81	0.00	2.84	14.59	3.89	0.00	4.15	73.72	12531.59	59.29	14.42
15/09/2003	23.8	20	0	20	0.00	77.48	0.00	2.81	14.56	4.10	15.80	4.15	34.46	1828.80	0.00	34.46
16/09/2003	19	0	0	0	0.00	64.31	0.00	2.20	14.52	3.25	0.00	4.15	38.61	6581.80	0.00	38.61
17/09/2003	19	0.4	0	0.4	0.00	64.31	0.00	2.20	14.49	3.25	0.00	4.15	42.76	7268.80	59.29	0.00
18/09/2003	21.5	0	0	0	0.00	71.17	0.00	2.49	14.45	3.84	0.00	4.15	4.15	705.00	59.29	0.00
19/09/2003	17.5	0	0	0	0.00	60.20	0.00	1.94	14.42	2.88	0.00	4.15	4.15	705.00	59.29	0.00
20/09/2003	20	2.9	0	2.9	0.00	67.06	0.00	2.34	14.39	3.42	0.00	4.15	4.15	705.00	0.00	4.15
21/09/2003	20.8	20.2	0	20.2	0.00	68.43	0.00	2.34	14.35	3.41	19.79	4.15	25.09	4285.11	0.00	25.09
22/09/2003	21	1.5	0	1.5	0.00	69.80	0.00	2.49	14.32	3.81	0.00	4.15	29.24	4970.11	0.00	29.24
23/09/2003	19.8	29	0	29	0.00	66.51	0.00	2.20	14.28	3.19	25.81	4.15	59.19	10092.59	0.00	59.19
24/09/2003	20	1.8	0	1.8	0.00	67.06	0.00	2.34	14.25	3.39	0.00	4.15	63.34	10787.59	0.00	63.34
25/09/2003	19.8	0	0	0	0.00	66.81	0.00	2.20	14.21	3.18	0.00	4.15	67.49	11472.59	0.00	67.49
26/09/2003	22.8	0	0	0	0.00	74.74	0.00	2.84	14.18	3.77	0.00	4.15	71.63	12177.59	59.29	12.34
27/09/2003	24	1.8	0	1.8	0.00	78.03	0.00	2.89	14.15	4.23	0.00	4.15	18.49	2802.59	0.00	18.49
28/09/2003	19.3	0	0	0	0.00	65.14	0.00	2.20	14.11	3.18	0.00	4.15	22.63	3497.59	0.00	22.63
29/09/2003	18.4	0	0	0	0.00	63.70	0.00	2.06	14.08	2.97	0.00	4.15	26.78	4192.59	0.00	26.78
30/09/2003	22.8	0	0	0	0.00	74.74	0.00	2.84	14.04	3.74	0.00	4.15	4.15	705.00	59.29	0.00
31/09/2003	23	5	0	5	0.00	75.29	0.00	2.81	14.01	3.88	1.04	4.15	5.19	881.80	0.00	5.19
01/10/2003	22	0	0	0	0.00	75.29	0.00	2.81	13.97	3.85	0.00	4.15	9.33	1588.80	0.00	9.33
02/10/2003	22	9.5	0	9.5	0.00	72.84	0.00	2.84	13.84	3.72	0.00	4.15	13.48	2281.80	0.00	13.48
03/10/2003	21.5	8	0	8	0.00	71.17	0.00	2.49	13.80	3.50	2.50	4.15	20.13	3422.38	0.00	20.13
04/10/2003	19.5	0	0	0	0.00	70.86	0.00	2.81	13.77	3.81	0.00	4.15	24.28	4127.38	0.00	24.28
05/10/2003	21.5	11.2	0	11.2	0.00	71.17	0.00	2.49	13.84	3.48	7.72	4.15	30.15	6144.80	0.00	30.15
06/10/2003	21.6	0	0	0	0.00	71.99	0.00	2.48	13.80	3.47	0.00	4.15	40.29	6849.88	0.00	40.29
07/10/2003	22.5	0	0	0	0.00	73.81	0.00	2.84	13.77	3.87	0.00	4.15	44.44	7554.88	59.29	0.00
08/10/2003	23.5	23	0	23	0.00	76.66	0.00	2.81	13.73	3.88	18.12	4.15	23.27	3959.14	0.00	23.27
09/10/2003	22	0	0	0	0.00	75.20	0.00	2.81	13.70	3.87	0.00	4.15	27.42	4651.14	0.00	27.42
10/10/2003	22.8	0	0	0	0.00	74.74	0.00	2.84	13.68	3.84	0.00	4.15	31.57	5346.14	59.29	0.00
11/10/2003	22.5	10.8	0	10.8	0.00	73.81	0.00	2.84	13.65	3.87	0.00	4.15	11.12	1889.65	0.00	11.12
12/10/2003	23.3	0	0	0	0.00	76.11	0.00	2.81	13.59	3.84	0.00	4.15	15.26	2584.65	0.00	15.26
13/10/2003	24.3	0	0	0	0.00	78.85	0.00	2.89	13.56	4.05	0.00	4.15	19.41	3289.65	59.29	0.00
14/10/2003	24.3	0	0	0	0.00	78.85	0.00	2.89	13.53	4.04	0.00	4.15	4.15	705.00	59.29	0.00
15/10/2003	23.5	0	0	0	0.00	76.66	0.00	2.81	13.49	3.81	0.00	4.15	4.15	705.00	59.29	0.00
16/10/2003	24.5	9.2	0	9.2	0.00	79.40	0.00	2.89	13.46	4.02	6.18	4.15	9.33	1585.45	0.00	9.33
17/10/2003	20.8	0	0	0	0.00	69.25	0.00	2.34	13.42	3.18	0.00	4.15	13.47	2290.45	0.00	13.47
18/10/2003	19.5	0	0	0	0.00	65.58	0.00	2.20	13.39	2.99	0.00	4.15	17.62	2985.45	59.29	0.00
19/10/2003	21.5	0	0	0	0.00	71.17	0.00	2.49	13.35	3.39	0.00	4.15	4.15	705.00	59.29	0.00
20/10/2003	22.5	0	0	0	0.00	73.81	0.00	2.84	13.32	3.65	0.00	4.15	4.15	705.00	59.29	0.00
21/10/2003	25	10	0	10	0.00	80.77	0.00	3.17	13.28	4.21	6.79	4.15	9.94	1890.00	0.00	9.94
22/10/2003	24	0	0	0	0.00	78.03	0.00	2.89	13.25	3.97	0.00	4.15	14.09	2395.00	0.00	14.09
23/10/2003	20.3	0	0	0	0.00	67.88	0.00	2.34	13.22	3.14	0.00	4.15	18.24	3100.00	59.29	0.00
24/10/2003	18.8	0	0	0	0.00	66.29	0.00	1.82	13.18	2.48	0.00	4.15	4.15	705.00	59.29	0.00
25/10/2003	23.3	5	0	5	0.00	78.11	0.00	2.81	13.15	3.71	1.29	4.15	5.43	923.80	0.00	5.43
26/10/2003	23	9	0	9	0.00	75.20	0.00	2.81	13.11	3.71	5.29	4.15	14.87	2528.61	0.00	14.87
27/10/2003	24	0	0	0	0.00	78.03	0.00	2.89	13.08	3.91	0.00	4.15	19.02	3233.61	0.00	19.02
28/10/2003	18	0	0	0	0.00	61.47	0.00	2.06	13.04	2.79	0.00	4.15	23.17	3938.61	59.29	0.00
29/10/2003	22.3	0	0	0	0.00	73.37	0.00	2.84	13.01	3.47	0.00	4.15	4.15	705.00	59.29	0.00
30/10/2003	17.8	0	0	0	0.00	61.02	0.00	1.84	12.97	2.17	0.00	4.15	4.15	705.00	59.29	0.00
31/10/2003	17.3	2	0	2	0.00	59.85	0.00	1.84	12.94	2.57	0.00	4.15	4.15	705.00	0.00	4.15
01/11/2003	16.5	7.6	0	7.6	0.00	57.45	0.00	1.82	12.91	2.41	5.19	4.15	13.48	2201.70	0.00	13.48
02/11/2003	17.8	0	0	0	0.00	61.02	0.00	1.84	12.87	2.85	0.00	4.15	17.63	2996.70	0.00	17.63
03/11/2003	20	0	0	0	0.00	67.06	0.00	2.34	12.84	3.05	0.00	4.15	21.77	3701.70	29.65	0.00
04/11/2003	19.8	0	0	0	0.00	66.51	0.00	2.20	12.80	2.88	0.00	4.15	4.15	705.00	29.65	0.00
05/11/2003	19.5	0	0	0	0.00	65.58	0.00	1.82	12.77	2.39	0.00	4.15	4.15	705.00	29.65	0.00
06/11/2003	18.5	0	0	0	0.00	62.45	0.00	1.82	12.73	2.38	0.00	4.15	4.15	705.00	29.65	0.00
07/11/2003	19.5	0	0	0	0.00	65.58	0.00	2.20	12.70	2.84	0.00	4.15	4.15	705.00	29.65	0.00
08/11/2003	20	0	0	0	0.00	67.06	0.00	2.34	12.66	3.01	0.00	4.15	4.15	705.00	29.65	0.00
09/11/2003	18.3	0	0	0	0.00	62.30	0.00	2.06	12.63	2.87	0.00	4.15	4.15	705.00	29.65	0.00
10/11/2003	20.5	0	0													

Running Daily Water Balance, Reeb Quarry - Phase 1A
Climate Data 1965-2007

Station No: PORT COLBORNE
 Province: ONTARIO
 Latitude: 42.88
 Longitude: -79.25
 Elevation: 175.3
 Climate Id: 8136606
 WMO Identifier:
 TC Identifier:

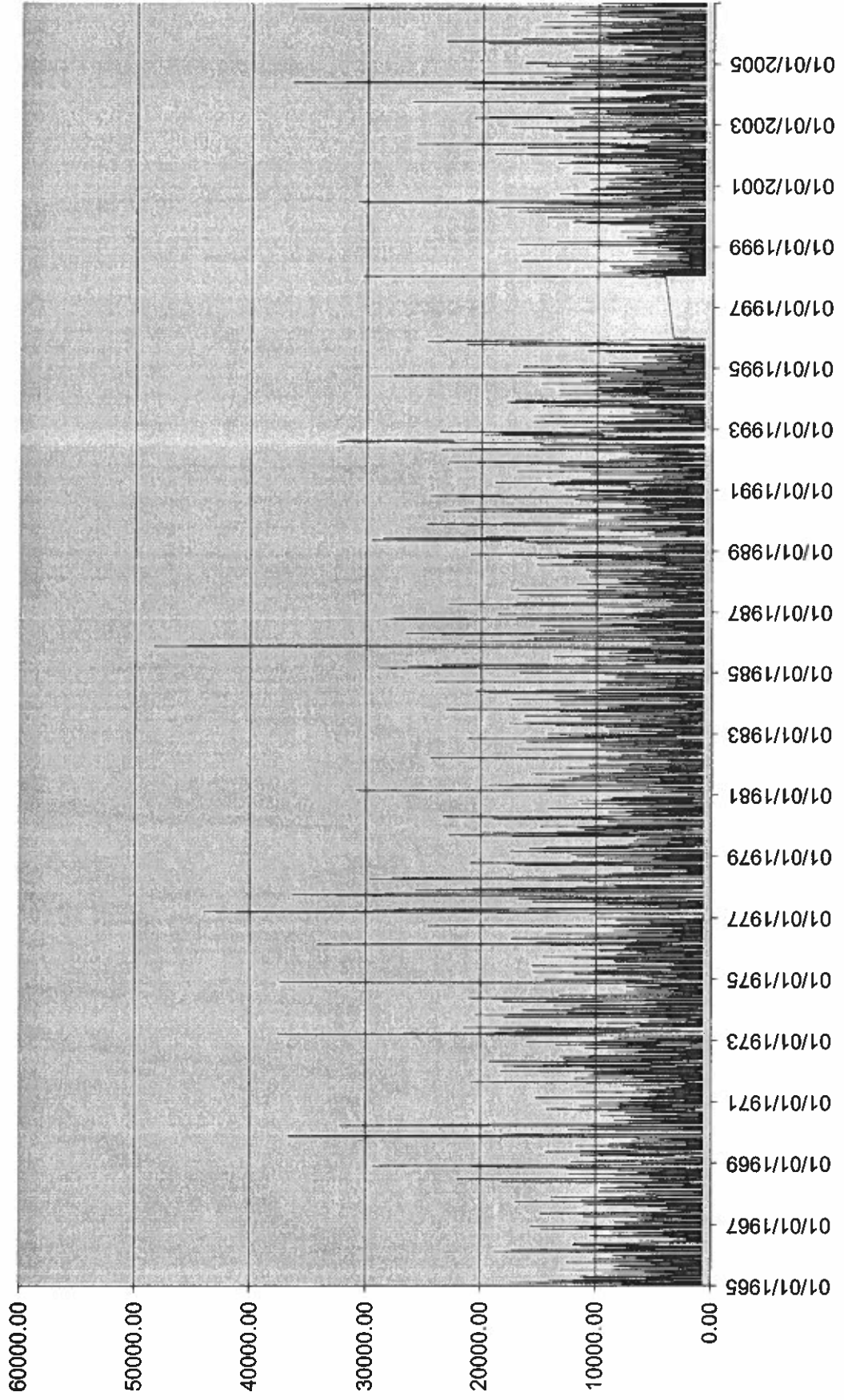
Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 59.29 mm 29.65 mm

Groundwater Inflow 257325 m³/yr
 705 m³/day
 4.15 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 284.33 mm
 48337 m³

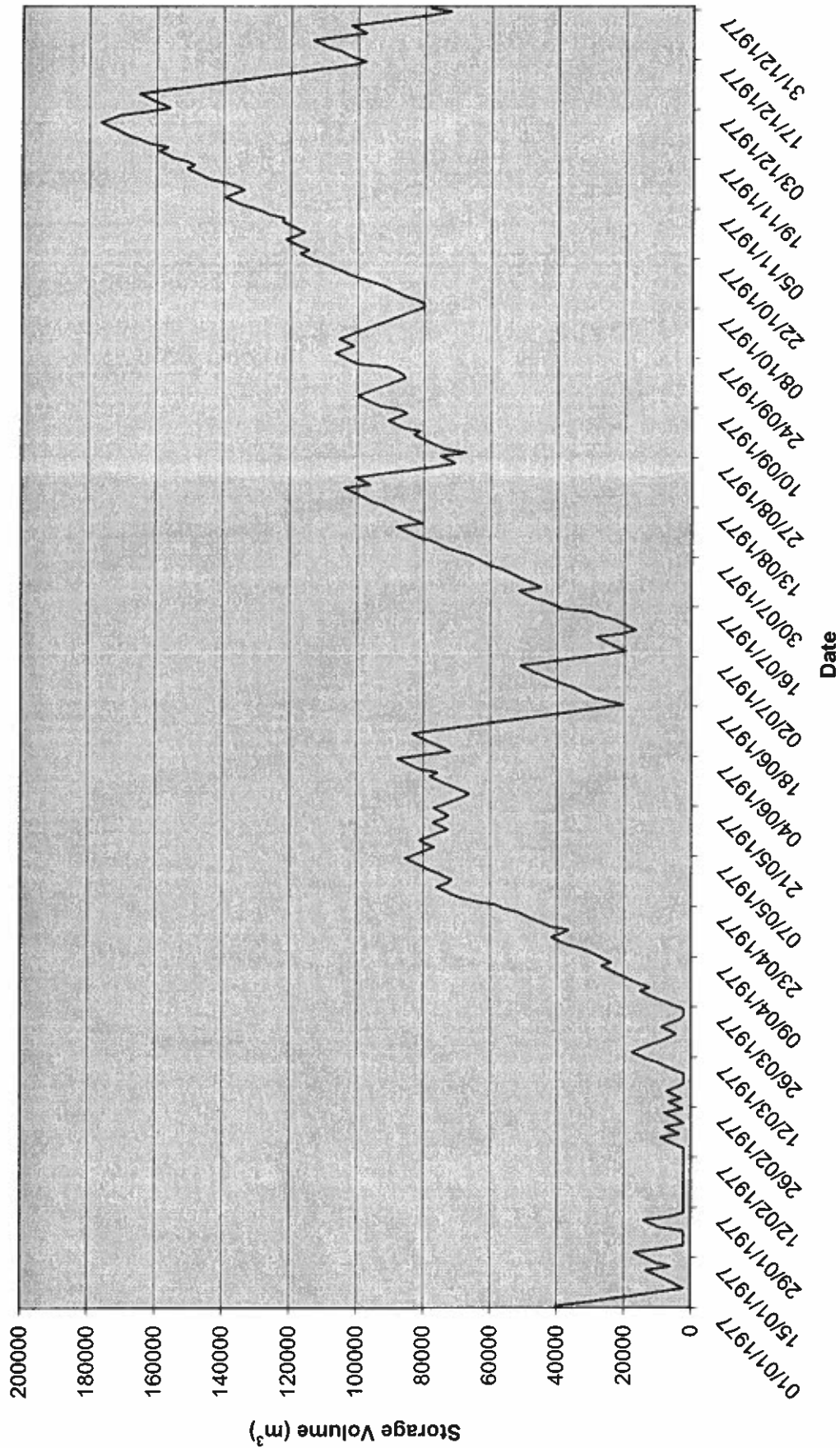
Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
28/02/2003	13	1	0	1	0.00	47.85	0.00	1.50	12.00	1.87	0.00	4.15	88.01	14982.18	0.00	88.01
29/02/2003	10.5	0	0	0	0.00	41.00	0.00	1.23	11.87	1.84	0.00	4.15	92.18	15087.19	0.00	92.18
30/02/2003	9.8	11.8	0	11.8	0.00	39.08	0.00	1.15	11.84	1.44	10.39	4.15	108.68	18172.99	0.00	108.68
01/03/2003	7	7	0	7	0.00	21.39	0.00	1.00	10.91	1.27	5.78	4.15	116.54	19812.22	0.00	116.54
02/03/2003	6.5	4.8	0	4.8	0.00	30.82	0.00	0.94	11.87	1.18	3.42	4.15	124.11	21086.32	0.00	124.11
03/03/2003	8	14	0	14	0.00	34.14	0.00	1.07	11.84	1.35	12.85	4.15	140.91	23854.18	0.00	140.91
04/03/2003	9.5	1	0	1	0.00	38.25	0.00	1.15	11.81	1.43	0.00	4.15	145.05	24639.18	0.00	145.05
05/03/2003	7.5	0	0	0	0.00	32.77	0.00	1.00	11.78	1.25	0.00	4.15	149.20	25384.18	0.00	149.20
06/03/2003	6.5	0	0	0	0.00	30.82	0.00	0.94	11.78	1.17	0.00	4.15	153.35	26099.18	29.65	153.70
07/03/2003	8.5	0	0	0	0.00	35.51	0.00	1.07	11.72	1.33	0.00	4.15	157.85	21754.18	29.65	98.20
08/03/2003	15.5	0	0	0	0.00	54.71	0.00	1.71	11.66	2.08	0.00	4.15	162.85	17399.18	29.65	72.70
09/03/2003	18	0	0	0	0.00	61.57	0.00	2.05	11.66	2.49	0.00	4.15	168.85	13054.18	29.65	47.20
10/03/2003	19	0	0	0	0.00	64.31	0.00	2.20	11.63	2.61	0.00	4.15	173.35	8729.18	29.65	21.70
11/03/2003	18.5	0	0	0	0.00	62.94	0.00	2.05	11.60	2.45	0.00	4.15	175.85	4384.18	29.65	0.00
12/03/2003	18.3	1.8	0	1.8	0.00	66.81	0.00	1.82	11.57	2.18	0.00	4.15	175.15	705.00	0.00	4.15
13/03/2003	12.3	0	0	0	0.00	45.83	0.00	1.40	11.54	1.89	0.00	4.15	9.29	1419.00	0.00	8.29
14/03/2003	15	20	0	20	0.00	32.34	0.00	1.71	11.50	2.03	17.87	4.15	30.41	5179.17	0.00	30.41
15/03/2003	10.8	1	0	1	0.00	41.82	0.00	1.23	11.47	1.68	0.00	4.15	34.50	5875.17	0.00	34.50
16/03/2003	9.5	0	0	0	0.00	38.25	0.00	1.15	11.44	1.38	0.00	4.15	38.71	6580.17	0.00	38.71
17/03/2003	8.5	0	0	0	0.00	35.51	0.00	1.07	11.41	1.30	0.00	4.15	42.85	7285.17	29.65	13.21
18/03/2003	0	7	0	7	0.00	30.88	0.00	1.15	11.38	1.38	5.82	4.15	22.97	3905.63	0.00	22.97
19/03/2003	6.3	1	0	1	0.00	38.25	0.00	1.07	11.35	1.29	0.00	4.15	27.12	4610.63	0.00	27.12
20/03/2003	10.5	0	0	0	0.00	41.00	0.00	1.23	11.32	1.49	0.00	4.15	31.27	5315.63	0.00	31.27
21/03/2003	14.3	1.4	0	1.4	0.00	51.42	0.00	1.80	11.29	1.87	0.00	4.15	35.42	6020.63	0.00	35.42
22/03/2003	5	1	0	1	0.00	25.91	0.00	0.97	11.28	1.05	0.00	4.15	39.55	6725.63	0.00	39.55
23/03/2003	3	0	0	0	0.00	20.42	0.00	0.78	11.23	0.82	0.00	4.15	43.71	7430.63	0.00	43.71
24/03/2003	6	0	0	0	0.00	28.85	0.00	0.94	11.20	1.12	0.00	4.15	47.85	8135.63	29.65	18.21
25/03/2003	9.5	14.8	0	14.8	0.00	38.25	0.00	1.15	11.18	1.35	13.45	4.15	35.81	9086.94	0.00	35.81
26/03/2003	8.5	8.1	0	8.1	0.00	38.25	0.00	1.15	11.13	1.35	8.75	4.15	48.71	7338.89	0.00	48.71
27/03/2003	7.3	1	0	1	0.00	32.22	0.00	1.00	11.10	1.18	0.00	4.15	50.85	6644.89	0.00	50.85
28/03/2003	7	1	0	1	0.00	31.39	0.00	1.00	11.07	1.18	0.00	4.15	55.00	6349.89	0.00	55.00
29/03/2003	10	0	0	0	0.00	39.82	0.00	1.23	11.04	1.43	0.00	4.15	59.15	10054.89	0.00	59.15
30/03/2003	10	0	0	0	0.00	39.82	0.00	1.23	11.01	1.42	0.00	4.15	63.29	10759.89	29.65	33.65
31/03/2003	14.3	0	0	0	0.00	81.42	0.00	1.80	10.98	1.82	0.00	4.15	37.79	9424.89	29.65	8.15
01/04/2003	17	0	0	0	0.00	45.11	0.00	1.40	10.95	1.60	3.49	4.15	15.99	2067.11	0.00	15.99
02/04/2003	10.5	11	0	11	0.00	41.00	0.00	1.23	10.92	1.41	8.89	4.15	29.83	6992.72	0.00	29.83
03/04/2003	10.3	3	0	3	0.00	40.45	0.00	1.23	10.89	1.41	1.59	4.15	35.17	6878.63	0.00	35.17
04/04/2003	10.3	1	0	1	0.00	40.45	0.00	1.23	10.88	1.40	0.00	4.15	39.32	6683.63	0.00	39.32
05/04/2003	11.5	1	0	1	0.00	43.74	0.00	1.31	10.83	1.49	0.00	4.15	43.46	7388.63	0.00	43.46
06/04/2003	6.3	0	0	0	0.00	29.47	0.00	0.84	10.79	1.08	0.00	4.15	47.61	8093.63	0.00	47.61
07/04/2003	4	0	0	0	0.00	23.18	0.00	0.81	10.78	0.84	0.00	4.15	51.76	8798.63	29.65	22.11
08/04/2003	-0.5	0	0	0	0.00	9.89	0.00	0.58	10.73	0.89	0.00	4.15	55.90	9493.63	29.65	0.00
09/04/2003	-0.5	0	0	0	0.00	0.00	0.00	0.58	10.70	0.88	0.00	4.15	4.15	705.00	29.65	0.00
10/04/2003	2.8	4	0	4	0.00	18.87	0.00	0.71	10.67	0.81	3.19	4.15	7.33	1246.71	0.00	7.33
11/04/2003	7.3	4	0	4	0.00	32.22	0.00	1.00	10.64	1.13	2.87	4.15	14.35	2439.18	0.00	14.35
12/04/2003	12.5	7.5	0	7.5	0.00	46.48	0.00	1.40	10.61	1.35	5.95	4.15	24.44	4153.30	0.00	24.44
13/04/2003	7	0.5	0	0.5	0.00	17.89	0.00	0.71	10.59	0.81	0.00	4.15	28.59	4890.30	0.00	28.59
14/04/2003	14.5	0	0	0	0.00	19.31	0.00	0.81	10.56	0.74	0.00	4.15	32.74	5585.30	0.00	32.74
15/04/2003	0	2	0	2	0.00	20.42	0.00	0.78	10.52	0.85	1.14	4.15	38.02	6464.08	0.00	38.02
16/04/2003	6.5	2	0	2	0.00	30.02	0.00	0.94	10.49	1.04	0.00	4.15	43.13	7331.50	0.00	43.13
17/04/2003	5.9	0	0	0	0.00	28.10	0.00	0.87	10.46	0.87	0.00	4.15	47.27	8036.50	0.00	47.27
18/04/2003	9	3	0	3	0.00	36.89	0.00	1.15	10.42	1.26	1.74	4.15	53.18	9036.50	0.00	53.18
19/04/2003	12.5	10	0	10	0.00	46.48	0.00	1.40	10.39	1.52	3.48	4.15	62.78	11183.18	0.00	62.78
20/04/2003	8.8	0	0	0	0.00	30.85	0.00	0.94	10.36	1.09	0.00	4.15	69.83	11888.18	0.00	69.83
21/04/2003	10	0	0	0	0.00	36.89	0.00	1.23	10.33	1.30	0.00	4.15	74.08	12593.18	29.65	44.43
22/04/2003	8.8	0	0	0	0.00	36.33	0.00	1.07	10.30	1.17	0.00	4.15	78.23	13298.18	29.65	18.03
23/04/2003	13	0	0	0	0.00	47.85	0.00	1.80	10.27	1.80	0.00	4.15	23.08	3923.18	29.65	0.00
24/04/2003	8.5	4	0	4	0.00	35.51	0.00	1.07	10.24	1.16	2.84	4.15	6.88	1187.42	0.00	6.88
25/04/2003	1	0	0	0	0.00	0.00	0.00	0.86	10.21	0.73	0.00	4.15	11.13	1892.42	0.00	11.13
26/04/2003	4.8	0	0	0	0.00	25.36	0.00	0.81	10.18	0.89	0.00	4.15	15.28	2397.42	29.65	0.00
27/04/2003	4	10.8	0	10.8	0.00	23.18	0.00	0.81	10.15	0.92	9.81	4.15	14.09	2399.24	0.00	14.09
28/04/2003	6	14	0	14	0.00	28.85	0.00	0.94	10.12	1.01	12.99	4.15	31.20	5303.62	0.00	31.20
29/04/2003	2.8	6.4	0	6.4	0.00	19.87	0.00	0.71	10.09	0.77	5.63	4.15	40.08	6663.62	0.00	40.08
30/04/2003	4.3	0.4	0	0.4	0.00	23.99	0.00	0.81	10.05	0.88	0.00	4.15	45.12	7870.62	0.00	45.12
01/05/2003	0.5	0	0	0	0.00	0.00	0.00	0.81	10.02	0.87	0.00	4.15	49.27	8375.62	29.65	19.82
02/05/2003	-2.5	0	0	0	0.00	0.00	0.00	0.55	9.98	0.81	0.00	4.15	23.77	4040.89	59.29	0.00
03/05/2003	-3.3	0	0	0	0.00	0.00	0.00	0.52	9.88	0.69	0.00	4.15	4.15	705.00	59.29	0.00
04/05/2003	0	0	0	0	0.00	0.00	0.00	0.81	9.83	0.69	0.00	4.15	4.15	705.00	59.29	0.00
05/05/2003	0.3	0	0	0	0.00	0.00	0.00	0.81	9.80	0.69	0.00	4.15	4.15	705.00	59.29	0.00
06/05/2003	-2.8	0	0	0	0.00	0.00	0.00	0.55	9.87	0.80	0.00	4.15	4.15	705.00	59.29	0.00
07/05/2003	-4	0	0	0	0.00	0.00	0.00	0.52	9.84	0.87	0.00	4.15	4.15	705.00	59.29	0.00
08/05/2003	-1.8	0	0	0	0.00	0.00	0.00	0.58	9.81	0.83	0.00	4.15	4.15	705.00	59.29	0.00
09/05/2003	3	1	0</													

Required Storage Volume (m³) 1965-2006
Phase 1A



**PHASE 1A WITH WORST CASE GROUNDWATER INFLOW
WATER BALANCE**

**Storage Volumes- Phase 1A (Worst Case Groundwater Inflow)
1992 Highest Year Recorded**



**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N-PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate Ic 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
59.29 mm 29.65 mm

Groundwater Inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/01/1962	-2	0	0	0	0	0	0	0.58	9.07	0.58	0.00	12.96	237.05	40265.71	59.29	177.74
02/01/1962	1.8	0	0	0	0	17.12	0.00	0.86	9.11	0.85	0.00	12.96	190.70	32418.84	59.29	131.40
03/01/1962	5.5	0	0	0	0	27.28	0.00	0.87	9.15	0.85	0.00	12.96	144.36	24541.06	59.29	85.07
04/01/1962	8.8	0	0	0	0	39.85	0.00	0.84	9.19	0.81	0.00	12.96	98.03	16985.08	59.29	38.74
05/01/1962	3.5	0	0	0	0	21.79	0.00	0.78	9.23	0.75	0.00	12.96	51.79	8788.21	59.29	0.00
06/01/1962	0.8	1	0	1	0	0.00	0.00	0.85	9.27	0.82	0.00	12.96	13.84	2289.51	0.00	13.34
07/01/1962	1.3	0	0	0	0	15.78	0.00	0.95	9.31	0.95	0.00	12.96	28.30	4471.83	0.00	28.30
08/01/1962	-0.5	0.8	0	0.8	0	0.00	0.00	0.58	9.35	0.69	0.21	12.96	38.47	6709.71	0.00	38.47
09/01/1962	2	1.8	0	1.8	0	17.68	0.00	0.71	9.39	0.72	1.08	12.96	53.51	8095.85	0.00	53.51
10/01/1962	0	0	2	2	2	2.00	0.00	0.95	9.43	0.87	0.00	12.96	68.47	11299.08	0.00	68.47
11/01/1962	0	0	0	0	2	2.00	0.00	0.81	9.47	0.83	0.00	12.96	79.43	13503.19	59.29	20.14
12/01/1962	-1.2	0	12	12	2.00	12.68	2.00	0.85	9.51	0.73	2.47	12.96	93.67	16489.89	0.00	35.67
13/01/1962	3.5	13	0	13	0	21.79	0.00	0.78	9.55	0.78	12.22	12.96	99.75	16927.34	0.00	99.75
14/01/1962	-1.5	1	4	5	4	4.00	0.00	0.58	9.59	0.81	0.39	12.96	74.10	12889.45	0.00	74.10
15/01/1962	-8	0	0	0	4	4.00	0.00	0.41	9.63	0.44	0.00	12.96	87.06	14789.58	0.00	87.06
16/01/1962	-12.3	0	8	8	10.00	0.00	0.00	0.23	9.67	0.27	0.00	12.96	100.02	17002.70	59.29	40.72
17/01/1962	-7.9	0	1	1	11.00	0.00	0.00	0.41	9.70	0.45	0.00	12.96	83.58	14143.82	59.29	0.00
18/01/1962	-12.5	0	0	0	11.00	0.00	0.00	0.25	9.74	0.28	0.00	12.96	70.35	11900.32	0.00	70.35
19/01/1962	-19.8	0	0	0	11.00	0.00	0.00	0.27	9.78	0.30	0.00	12.96	12.96	2203.12	59.29	0.00
20/01/1962	-7	0	10	10	21.00	0.00	0.00	0.44	9.82	0.48	0.00	12.96	12.96	2203.12	59.29	0.00
21/01/1962	-4	0	0	0	21.00	0.00	0.00	0.52	9.86	0.57	0.00	12.96	12.96	2203.12	59.29	0.00
22/01/1962	-1.5	1.7	0	1.7	21.00	0.00	0.00	0.58	9.90	0.63	1.07	12.96	14.03	2384.63	0.00	14.03
23/01/1962	3	10.8	0	10.8	21.00	20.42	20.42	0.78	9.94	0.81	30.41	12.96	57.40	9757.19	0.00	57.40
24/01/1962	-3.8	0	0	0	0	0.58	0.00	0.52	9.98	0.59	0.00	12.96	70.35	11900.32	0.00	70.35
25/01/1962	-7	0	0	0	0	0.58	0.00	0.44	10.02	0.48	0.00	12.96	63.31	10833.44	59.29	24.02
26/01/1962	-7.8	0	0	0	0	0.58	0.00	0.41	10.06	0.46	0.00	12.96	39.86	6288.58	59.29	0.00
27/01/1962	-4.8	0	0	0	0	0.58	0.00	0.50	10.10	0.56	0.00	12.96	12.96	2203.12	59.29	0.00
28/01/1962	-2	0	0	0	0	0.58	0.00	0.58	10.14	0.65	0.00	12.96	12.96	2203.12	59.29	0.00
29/01/1962	-1.5	0	0	0	0	0.58	0.00	0.58	10.18	0.65	0.00	12.96	12.96	2203.12	59.29	0.00
30/01/1962	0.5	0	0	0	0	0.58	0.00	0.60	10.22	0.69	0.00	12.96	12.96	2203.12	59.29	0.00
31/01/1962	0.5	0	0	0	0	0.58	0.00	0.61	10.26	0.69	0.00	12.96	12.96	2203.12	59.29	0.00
01/02/1962	-5.5	0	0	0	0	0.58	0.00	0.38	10.30	0.44	0.00	12.96	12.96	2203.12	59.29	0.00
02/02/1962	-5.5	0	0	0	0	0.58	0.00	0.44	10.34	0.51	0.00	12.96	12.96	2203.12	59.29	0.00
03/02/1962	-2	0	0	0	0	0.58	0.00	0.58	10.38	0.66	0.00	12.96	12.96	2203.12	59.29	0.00
04/02/1962	-0.3	0	0	0	0	0.58	0.00	0.58	10.42	0.66	0.00	12.96	12.96	2203.12	59.29	0.00
05/02/1962	-5	0	0	0	0	0.58	0.00	0.50	10.46	0.59	0.00	12.96	12.96	2203.12	59.29	0.00
06/02/1962	-0.5	0	0	0	0	0.58	0.00	0.58	10.50	0.64	0.00	12.96	12.96	2203.12	59.29	0.00
07/02/1962	-0.5	0	3	3	3.58	0.00	0.00	0.58	10.54	0.67	0.00	12.96	12.96	2203.12	59.29	0.00
08/02/1962	-4.5	0	0	0	3.58	0.00	0.00	0.50	10.58	0.58	0.00	12.96	12.96	2203.12	59.29	0.00
09/02/1962	-1.1	0	0	0	3.58	0.00	0.00	0.27	10.62	0.33	0.00	12.96	12.96	2203.12	59.29	0.00
10/02/1962	-4	0	0	0	3.58	0.00	0.00	0.47	10.66	0.50	0.00	12.96	12.96	2203.12	59.29	0.00
11/02/1962	-8	0	0	0	3.58	0.00	0.00	0.47	10.70	0.50	0.00	12.96	12.96	2203.12	59.29	0.00
12/02/1962	-11.4	0	0	0	3.58	0.00	0.00	0.81	10.74	0.30	0.00	12.96	12.96	2203.12	59.29	0.00
13/02/1962	-7.5	0	2.2	2.2	5.78	0.00	0.00	0.41	10.78	0.50	0.00	12.96	12.96	2203.12	59.29	0.00
14/02/1962	-1.8	0	0	0	5.78	0.00	0.00	0.58	10.82	0.69	0.00	12.96	12.96	2203.12	59.29	0.00
15/02/1962	2.3	19	0	19	5.78	18.50	5.78	0.71	10.86	0.83	14.95	12.96	27.81	4744.45	0.00	27.81
16/02/1962	9	0	2.4	2.4	2.40	0.00	0.00	0.61	10.90	0.73	0.00	12.96	40.87	6847.57	0.00	40.87
17/02/1962	0.3	0	0	0	2.40	0.00	0.00	0.81	10.94	0.73	0.00	12.96	53.63	9150.89	59.29	0.00
18/02/1962	2.3	5.8	0	5.8	2.40	18.50	2.40	0.71	10.98	0.84	7.15	12.96	20.12	3430.67	0.00	20.12
19/02/1962	2.8	0	0	0	0	0.00	0.00	0.81	11.02	0.84	0.00	12.96	33.08	5521.89	0.00	33.08
20/02/1962	0.8	0	0	0	0	0.00	0.00	0.81	11.06	0.73	0.00	12.96	49.04	7828.81	59.29	0.00
21/02/1962	-1	0	0	0	0	0.00	0.00	0.68	11.10	0.79	0.00	12.96	12.96	2203.12	59.29	0.00
22/02/1962	0.5	9.2	0	9.2	0.00	0.00	0.00	0.81	11.14	0.74	8.46	12.96	21.42	3641.21	0.00	21.42
23/02/1962	2.3	0	0	0	0.00	18.50	0.00	0.71	11.18	0.85	0.00	12.96	34.38	5844.34	0.00	34.38
24/02/1962	-1.9	0	0	0	0.00	0.00	0.00	0.58	11.22	0.72	0.00	12.96	47.34	8041.48	59.29	0.00
25/02/1962	1.5	2	0	2	0	0.00	0.00	0.68	11.26	0.80	1.20	12.96	14.10	2408.99	0.00	14.10
26/02/1962	-0.5	0	0	0	0.00	0.00	0.00	0.58	11.30	0.72	0.00	12.96	27.12	4609.82	0.00	27.12
27/02/1962	1.5	0	0	0	0	0.00	19.31	0.68	11.34	0.81	0.00	12.96	49.09	6812.84	59.29	0.00
28/02/1962	0.5	5.2	0	5.2	0.00	0.00	0.00	0.61	11.38	0.76	4.44	12.96	17.40	2958.81	0.00	17.40
29/02/1962	-5.5	0	0	0	0.00	0.00	0.00	0.47	11.42	0.59	0.00	12.96	30.36	4181.63	0.00	30.36
01/03/1962	-1.8	0	0	0	0.00	0.00	0.00	0.58	11.46	0.73	0.00	12.96	43.32	7384.78	29.65	13.68
02/03/1962	-1.5	0	0	0	0.00	0.00	0.00	0.58	11.50	0.73	0.00	12.96	26.83	4521.86	29.65	0.00
03/03/1962	-0.5	0	0	0	0.00	0.00	0.00	0.58	11.54	0.73	0.00	12.96	12.96	2203.12	29.65	0.00
04/03/1962	3	0	0	0	0.00	20.42	0.00	0.78	11.58	0.85	0.00	12.96	12.96	2203.12	29.65	0.00
05/03/1962	6.3	0	0	0	0.00	28.73	0.00	0.87	11.62	1.06	0.00	12.96	12.96	2203.12	29.65	0.00
06/03/1962	8	2	0	2	0.00	34.14	0.00	1.07	11.66	1.33	0.87	12.96	13.63	2317.75	0.00	13.63
07/03/1962	7.5	8.2	0	8.2	0.00	32.77	0.00	1.00	11.70	1.24	4.98	12.96	31.55	5383.92	0.00	31.55
08/03/1962	3.5	0.8	0	0.8	0.00	21.79	0.00	0.78	11.74	0.99	0.00	12.96	44.54	7898.44	0.00	44.54
09/03/1962	7.3	2	0	2	0.00	32.22	0.00	1.00	11.78	1.25	0.74	12.96	56.21	9898.41	0.00	56.21
10/03/1962	5.5	7	1	8	1.00	27.28	1.00	0.87	11.82	1.10	6.90	12.96	78.07	13272.23	0.00	78.07
11/03/1962	-12	0	4	4	4.00	0.00	0.00	0.26	11.86	0.35	0.00	12.96	91.03	15475.35	0.00	91.03
12/03/1962	-6.6	0	1	1	5.00	0.00	0.00	0.29	11.90	0.39	0.00	12.96	103.89	17878.47	29.65	74.34
13/03/1962	-9.3	0	0	0	5.00	0.00	0.00	0.22	11.94	0.39	0.00	12.96	87.30	14841.80	29.65	5

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate k: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter 7000 L/min 0.125 m³/s 59.25 mm
Spring, Fall 3500 L/min 0.0625 m³/s 29.65 mm

Groundwater Inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release (mm)	Storage Carryover (mm)
20/03/1967	9	0	0	0	0	0	0	0.61	12.52	0.63	0.00	12.96	69.29	15296.72	29.65	69.29
30/03/1967	-3	1.4	0	1.4	0.00	20.42	0.00	0.75	12.56	1.03	0.37	12.96	73.63	12519.28	0.00	73.63
31/03/1967	3.5	0	5	5	5.00	21.79	5.00	0.76	12.59	1.03	3.87	12.96	90.56	15394.04	0.00	90.56
01/04/1967	1.3	2.2	0	2.2	0.00	15.78	0.00	0.66	12.63	0.90	1.39	12.96	104.82	17818.87	0.00	104.82
02/04/1967	-1.5	0	0	0	0.00	0.00	0.00	0.58	12.66	0.81	0.00	12.96	117.78	20021.80	0.00	117.78
03/04/1967	-1.9	1.8	0	1.8	0.00	0.00	0.00	0.58	12.69	0.81	0.79	12.96	131.52	22339.18	0.00	131.52
04/04/1967	2.8	0.4	0	0.4	0.00	18.82	0.00	0.71	12.73	0.97	0.00	12.96	144.49	24592.90	0.00	144.49
05/04/1967	3.5	0	0	0	0.00	21.79	0.00	0.76	12.76	1.04	0.00	12.96	157.44	26785.43	29.65	127.80
06/04/1967	2.3	0.8	0	0.8	0.00	18.50	0.00	0.71	12.80	0.86	0.00	12.96	140.76	23628.55	0.00	140.76
07/04/1967	7.3	0	0	0	0.00	32.22	0.00	1.00	12.83	1.37	0.00	12.96	153.72	26151.07	0.00	153.72
08/04/1967	5.5	0.8	0	0.8	0.00	27.28	0.00	0.87	12.86	1.20	0.00	12.96	166.69	28334.80	0.00	166.69
09/04/1967	6.3	1	0	1	0.00	29.47	0.00	0.94	12.90	1.29	0.00	12.96	179.63	30527.92	0.00	179.63
10/04/1967	7	5.7	0	5.7	0.00	31.39	0.00	0.94	13.14	1.31	0.00	12.96	247.72	42119.07	0.00	247.72
11/04/1967	5.5	11.1	0	11.1	0.00	27.28	0.00	0.87	12.97	1.21	8.88	12.96	219.27	37275.38	0.00	219.27
12/04/1967	3.8	0	0	0	0.00	22.82	0.00	0.79	13.00	1.06	0.00	12.96	232.23	39478.81	0.00	232.23
13/04/1967	-0.5	0	0	0	0.00	0.00	0.00	0.58	13.03	0.83	0.00	12.96	245.19	41681.63	29.65	215.54
14/04/1967	3	4.2	0	4.2	0.00	20.42	0.00	0.76	13.07	1.07	0.00	12.96	278.50	43844.75	29.65	188.85
15/04/1967	4.3	4.2	0	4.2	0.00	23.99	0.00	0.81	13.10	1.14	3.08	12.96	214.87	39527.41	0.00	214.87
16/04/1967	6.5	21.2	0	21.2	0.00	35.02	0.00	0.94	13.14	1.31	0.00	12.96	247.72	42119.07	0.00	247.72
17/04/1967	4.5	1.4	0	1.4	0.00	24.54	0.00	0.81	13.17	1.15	0.25	12.96	290.93	44357.85	0.00	290.93
18/04/1967	4.5	6.2	0	6.2	0.00	24.54	0.00	0.81	13.20	1.15	4.05	12.96	277.84	42749.14	0.00	277.84
19/04/1967	13	0	0	0	0.00	47.85	0.00	1.50	13.24	2.09	0.00	12.96	290.90	44452.26	0.00	290.90
20/04/1967	16	1.4	0	1.4	0.00	56.08	0.00	1.82	13.27	2.49	0.00	12.96	303.86	45165.36	0.00	303.86
21/04/1967	14.5	13.6	0	13.6	0.00	51.87	0.00	1.80	13.31	2.29	11.40	12.96	328.21	45795.65	0.00	328.21
22/04/1967	17.3	3	0	3	0.00	45.83	0.00	1.40	13.34	1.93	1.05	12.96	342.22	46177.09	0.00	342.22
23/04/1967	9.8	24	0	24	0.00	38.08	0.00	1.15	13.37	1.82	22.98	12.96	377.84	46180.32	0.00	377.84
24/04/1967	7.3	15.5	0	15.5	0.00	32.22	0.00	1.00	13.41	1.43	14.07	12.96	404.59	46870.79	0.00	404.59
25/04/1967	5.5	4.5	0	4.5	0.00	27.28	0.00	0.87	13.44	1.25	3.25	12.96	420.80	47355.85	0.00	420.80
26/04/1967	7.8	0	0	0	0.00	33.50	0.00	1.00	13.48	1.43	0.00	12.96	433.76	47738.87	0.00	433.76
27/04/1967	9.3	0	0	0	0.00	37.70	0.00	1.15	13.51	1.64	0.00	12.96	446.72	48124.10	29.65	417.07
28/04/1967	7.8	0	0	0	0.00	33.59	0.00	1.00	13.55	1.44	0.00	12.96	459.63	48509.22	29.65	429.36
29/04/1967	9.5	9	0	9	0.00	38.25	0.00	1.15	13.59	1.64	7.98	12.96	430.79	47918.89	0.00	430.79
30/04/1967	9.5	1.8	0	1.8	0.00	38.25	0.00	1.15	13.61	1.65	0.15	12.96	433.81	48348.06	0.00	433.81
01/05/1967	10	1.3	0	1.3	0.00	38.02	0.00	1.23	13.65	1.76	0.00	12.96	446.77	48735.16	0.00	446.77
02/05/1967	14.5	5.8	0	5.8	0.00	51.97	0.00	1.80	13.68	2.27	3.33	12.96	463.07	49212.20	0.00	463.07
03/05/1967	10.5	1.2	0	1.2	0.00	41.00	0.00	1.23	13.72	1.77	0.00	12.96	476.03	49694.33	0.00	476.03
04/05/1967	8.3	0	0	0	0.00	34.99	0.00	1.07	13.75	1.56	0.00	12.96	488.99	50172.45	0.00	488.99
05/05/1967	8.5	0	0	0	0.00	35.51	0.00	1.07	13.78	1.56	0.00	12.96	491.94	50650.17	29.65	462.29
06/05/1967	9.5	0	0	0	0.00	35.51	0.00	1.07	13.82	1.67	0.00	12.96	485.29	50493.70	29.65	455.61
07/05/1967	10.8	0	0	0	0.00	41.82	0.00	1.23	13.85	1.78	0.00	12.96	466.57	49658.82	29.65	436.92
08/05/1967	13.8	1	0	1	0.00	49.23	0.00	1.50	13.89	2.18	0.00	12.96	451.89	48819.94	0.00	451.89
09/05/1967	15.8	0	0	0	0.00	55.53	0.00	1.71	13.92	2.45	0.00	12.96	464.84	49023.07	0.00	464.84
10/05/1967	12.8	0	0	0	0.00	47.30	0.00	1.40	13.95	2.04	0.00	12.96	477.80	49226.19	29.65	448.16
11/05/1967	18.8	0	0	0	0.00	58.28	0.00	1.82	13.99	2.81	0.00	12.96	491.11	49399.31	29.65	461.47
12/05/1967	20	0	0	0	0.00	67.08	0.00	2.34	14.02	3.33	0.00	12.96	444.43	48552.44	29.65	414.78
13/05/1967	19.8	1	0	1	0.00	58.28	0.00	1.82	14.06	2.83	0.00	12.96	427.74	47215.56	0.00	427.74
14/05/1967	10.5	0	0	0	0.00	41.00	0.00	1.23	14.09	1.82	0.00	12.96	440.70	47618.86	0.00	440.70
15/05/1967	14.5	0	0	0	0.00	51.97	0.00	1.80	14.12	2.34	0.00	12.96	453.66	47712.81	29.65	424.01
16/05/1967	17	0	0	0	0.00	58.83	0.00	1.84	14.16	2.82	0.00	12.96	436.87	47484.03	29.65	407.32
17/05/1967	20.3	9.8	0	9.8	0.00	67.88	0.00	2.34	14.19	3.37	8.23	12.96	420.81	47207.21	0.00	420.81
18/05/1967	13.8	0	0	0	0.00	50.05	0.00	1.59	14.23	2.1	0.00	12.96	439.47	47470.33	0.00	439.47
19/05/1967	14.5	0	0	0	0.00	51.97	0.00	1.80	14.26	2.36	0.00	12.96	452.43	47613.46	29.65	422.78
20/05/1967	19	0	0	0	0.00	64.31	0.00	2.20	14.29	3.20	0.00	12.96	435.74	47405.58	29.65	406.10
21/05/1967	19.3	0	0	0	0.00	65.14	0.00	2.20	14.33	3.21	0.00	12.96	419.09	47129.70	29.65	389.41
22/05/1967	18.5	0	0	0	0.00	62.94	0.00	2.09	14.36	3.03	0.00	12.96	422.37	46402.83	29.65	372.72
23/05/1967	19.3	7.8	0	7.8	0.00	65.14	0.00	2.20	14.40	3.22	4.58	12.96	399.28	46344.14	0.00	399.28
24/05/1967	9	0	0	0	0.00	34.14	0.00	1.07	14.43	1.64	0.00	12.96	403.22	46647.27	0.00	403.22
25/05/1967	8.8	3.8	0	3.8	0.00	38.33	0.00	1.07	14.46	1.64	2.18	12.96	416.34	47117.67	0.00	416.34
26/05/1967	9.8	3.8	0	3.8	0.00	38.86	0.00	1.15	14.50	1.78	2.04	12.96	433.34	47697.80	0.00	433.34
27/05/1967	10.8	0	0	0	0.00	41.82	0.00	1.23	14.53	1.87	0.00	12.96	446.30	48171.02	0.00	446.30
28/05/1967	11	0	0	0	0.00	42.37	0.00	1.31	14.57	2.00	0.00	12.96	459.26	48645.14	29.65	429.61
29/05/1967	15.8	9	0	9	0.00	54.71	0.00	1.71	14.60	2.57	3.43	12.96	448.00	48202.96	0.00	448.00
30/05/1967	12.8	20.4	0	20.4	0.00	47.30	0.00	1.40	14.63	2.14	18.20	12.96	477.42	48127.82	0.00	477.42
31/05/1967	13.3	1.4	0	1.4	0.00	46.98	0.00	1.50	14.67	2.28	0.00	12.96	490.18	48331.04	0.00	490.18
01/06/1967	18.5	0	0	0	0.00	57.45	0.00	1.82	14.70	2.75	0.00	12.96	503.14	48534.17	0.00	503.14
02/06/1967	15.3	0	0	0	0.00	54.18	0.00	1.71	14.74	2.60	0.00	12.96	516.10	48737.29	59.29	456.81
03/06/1967	18.8	0	0	0	0.00	63.76	0.00	2.06	14.77	3.11	0.00	12.96	498.77	48480.41	59.29	410.47
04/06/1967	19.8	0.8	0	0.8	0.00	66.51	0.00	2.20	14.81	3.31	0.00	12.96	473.43	47186.54	0.00	473.43
05/06/1967	16.3	2.2	0	2.2	0.00	62.39	0.00	2.06	14.84	3.13	0.00	12.96	456.39	47186.89	0.00	456.39
06/06/1967	19	0.8	0	0.8	0.00	64.31	0.00	2.20	14.87	3.33	0.00	12.96	449.35	47359.78	0.00	449.35
07																

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1955-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate I: 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter 7000 L/min
0.125 m³/s
59.29 mm
Spring, Fall 3500 L/min
0.0625 m³/s
29.65 mm

Groundwater Inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
25/06/1992	15	0	0	0	0	53.34	0.00	1.71	15.18	2.68	0.00	12.96	257.76	43818.57	0.00	257.76
26/06/1992	17.3	0.8	0	0.8	0.00	59.65	0.00	1.94	15.14	3.01	3.59	12.96	274.31	46832.89	0.00	274.31
27/06/1992	17.3	0.2	0	0.2	0.00	59.65	0.00	1.94	15.11	3.00	0.00	12.96	287.27	48830.02	0.00	287.27
28/06/1992	18.8	0	0	0	0.00	55.53	0.00	1.71	15.07	2.65	0.00	12.96	300.23	51099.14	59.29	240.94
29/06/1992	18.8	0	0	0	0.00	65.68	0.00	2.20	15.04	3.39	0.00	12.96	333.80	43162.26	59.29	184.00
30/06/1992	20	0	0	0	0.00	67.09	0.00	2.34	15.01	3.87	0.00	12.96	397.96	35285.39	59.29	139.27
01/07/1992	20.2	0	0	0	0.00	67.89	0.00	2.34	14.97	3.55	0.00	12.96	481.94	27409.51	59.29	101.84
02/07/1992	19.3	3.8	0	3.8	0.00	65.14	0.00	2.20	14.94	3.34	0.28	12.96	115.15	19575.27	0.00	115.15
03/07/1992	20	3.2	0	3.2	0.00	67.09	0.00	2.34	14.90	3.64	0.00	12.96	128.11	21778.39	0.00	128.11
04/07/1992	19.3	4.2	0	4.2	0.00	65.14	0.00	2.20	14.87	3.53	0.87	12.96	141.04	24129.76	0.00	141.04
05/07/1992	20	0	0	0	0.00	67.09	0.00	2.34	14.83	3.53	0.00	12.96	154.90	26332.62	0.00	154.90
06/07/1992	19	0	0	0	0.00	66.08	0.00	1.87	14.80	2.77	0.00	12.96	167.89	28535.01	59.29	108.60
07/07/1992	18.8	0	0	0	0.00	67.89	0.00	1.87	14.78	2.78	0.00	12.96	179.92	29923.56	0.00	179.92
08/07/1992	19.8	28	0	28	0.00	63.78	0.00	2.08	14.73	3.10	22.90	12.96	95.09	19874.78	0.00	95.09
09/07/1992	20	0	0	0	0.00	67.09	0.00	2.34	14.70	3.49	0.00	12.96	111.05	16877.60	0.00	111.05
10/07/1992	20.3	1.6	0	1.6	0.00	67.89	0.00	2.34	14.66	3.49	0.00	12.96	124.01	21081.02	0.00	124.01
11/07/1992	19.3	0	0	0	0.00	65.14	0.00	2.20	14.63	3.27	0.00	12.96	136.97	23284.13	0.00	136.97
12/07/1992	19.5	19.4	0	19.4	0.00	63.98	0.00	2.20	14.59	3.28	19.14	12.96	153.09	27220.38	0.00	153.09
13/07/1992	21.5	1.2	0	1.2	0.00	71.17	0.00	2.49	14.56	3.66	0.00	12.96	179.92	29923.56	0.00	179.92
14/07/1992	21	43	0	43	0.00	69.80	0.00	2.49	14.52	3.66	39.34	12.96	228.32	36814.84	0.00	228.32
15/07/1992	18.8	3.2	0	3.2	0.00	63.78	0.00	2.08	14.49	3.05	0.15	12.96	241.43	41024.21	0.00	241.43
16/07/1992	18.5	0.8	0	0.8	0.00	65.68	0.00	2.20	14.45	3.23	0.00	12.96	254.39	43246.04	0.00	254.39
17/07/1992	18	13	0	13	0.00	61.57	0.00	2.08	14.42	3.05	9.95	12.96	277.30	47141.39	0.00	277.30
18/07/1992	19.5	0	0	0	0.00	63.98	0.00	2.20	14.38	3.22	0.00	12.96	290.26	49344.46	0.00	290.26
19/07/1992	20.8	0	0	0	0.00	69.24	0.00	2.34	14.35	3.40	0.00	12.96	303.22	51547.80	59.29	243.93
20/07/1992	22	10.8	0	10.8	0.00	72.64	0.00	2.54	14.32	3.82	6.79	12.96	363.87	44823.09	0.00	263.87
21/07/1992	17.5	0	0	0	0.00	60.20	0.00	1.84	14.28	2.84	0.00	12.96	278.62	47026.21	0.00	278.62
22/07/1992	16.3	5.2	0	5.2	0.00	56.81	0.00	1.62	14.25	2.67	2.53	12.96	292.12	49890.04	0.00	292.12
23/07/1992	16.8	0.8	0	0.8	0.00	58.26	0.00	1.62	14.21	2.68	0.00	12.96	305.06	51893.17	0.00	305.06
24/07/1992	16.5	0	0	0	0.00	62.84	0.00	2.08	14.18	2.89	0.00	12.96	318.04	54908.29	0.00	318.04
25/07/1992	21	7	0	7	0.00	68.89	0.00	2.49	14.15	3.55	0.00	12.96	331.00	58208.41	0.00	331.00
26/07/1992	19.3	10	0	10	0.00	65.14	0.00	2.20	14.11	3.16	6.84	12.96	350.89	60933.61	0.00	350.89
27/07/1992	19.3	0	0	0	0.00	65.14	0.00	2.20	14.08	3.15	0.00	12.96	363.76	61838.73	0.00	363.76
28/07/1992	19	1.8	0	1.8	0.00	66.08	0.00	1.82	14.04	2.83	0.00	12.96	376.72	64041.85	0.00	376.72
29/07/1992	20.5	0	0	0	0.00	68.43	0.00	2.34	14.01	3.32	0.00	12.96	389.68	66244.98	0.00	389.68
30/07/1992	18	10.8	0	10.8	0.00	59.06	0.00	1.82	13.97	2.82	8.18	12.96	410.62	69639.11	0.00	410.62
31/07/1992	13.3	8	0	8	0.00	49.89	0.00	1.66	13.84	2.17	5.85	12.96	428.81	72633.67	0.00	428.81
01/08/1992	19.3	0	0	0	0.00	68.89	0.00	2.49	13.81	3.37	4.43	12.96	459.26	75747.02	0.00	459.26
02/08/1992	21	0.8	0	0.8	0.00	69.80	0.00	2.49	13.87	3.49	0.00	12.96	453.53	77439.46	0.00	453.53
03/08/1992	19.8	1.4	0	1.4	0.00	66.61	0.00	2.20	13.84	3.09	19.91	12.96	479.39	81487.03	0.00	479.39
04/08/1992	17	2.8	0	2.8	0.00	68.83	0.00	1.94	13.80	2.75	0.00	12.96	492.35	83700.18	0.00	492.35
05/08/1992	16.8	0	0	0	0.00	68.28	0.00	1.82	13.77	2.67	0.00	12.96	505.31	85903.28	0.00	505.31
06/08/1992	18.5	0	0	0	0.00	62.84	0.00	2.08	13.73	2.89	0.00	12.96	518.27	88106.40	59.29	458.98
07/08/1992	21	3.2	0	3.2	0.00	68.89	0.00	2.49	13.69	3.37	4.43	12.96	531.23	90309.53	0.00	531.23
08/08/1992	22	6.4	0	6.4	0.00	72.64	0.00	2.64	13.66	3.85	2.75	12.96	487.85	92900.90	0.00	487.85
09/08/1992	21.8	0.4	0	0.4	0.00	71.69	0.00	2.49	13.63	3.42	0.00	12.96	500.61	95103.81	0.00	500.61
10/08/1992	21.8	5.8	0	5.8	0.00	71.69	0.00	2.49	13.59	3.42	2.38	12.96	515.95	97712.33	0.00	515.95
11/08/1992	20	0	0	0	0.00	67.08	0.00	2.34	13.56	3.22	0.00	12.96	528.81	99915.46	0.00	528.81
12/08/1992	19.8	1.4	0	1.4	0.00	65.53	0.00	1.71	13.53	2.98	0.00	12.96	541.87	92119.88	0.00	541.87
13/08/1992	19.8	6.8	0	6.8	0.00	64.71	0.00	1.71	13.49	2.81	0.00	12.96	558.26	95747.02	0.00	558.26
14/08/1992	19.8	0	0	0	0.00	64.28	0.00	1.82	13.46	2.81	0.00	12.96	572.22	97277.15	0.00	572.22
15/08/1992	17	2.4	0	2.4	0.00	58.83	0.00	1.84	13.42	2.87	0.00	12.96	585.18	99490.27	0.00	585.18
16/08/1992	18.5	0	0	0	0.00	62.84	0.00	2.08	13.39	2.82	0.00	12.96	598.14	101893.39	0.00	598.14
17/08/1992	17.3	0	0	0	0.00	66.05	0.00	1.94	13.35	2.65	0.00	12.96	611.10	103896.52	59.29	551.80
18/08/1992	17.6	1.8	0	1.8	0.00	69.29	0.00	1.94	13.32	2.65	0.00	12.96	624.06	106000.64	0.00	624.06
19/08/1992	17.8	0	0	0	0.00	69.29	0.00	1.94	13.28	2.64	0.00	12.96	637.02	108104.76	0.00	637.02
20/08/1992	14	0	0	0	0.00	60.89	0.00	1.69	13.25	2.20	0.00	12.96	650.98	109415.89	59.29	591.69
21/08/1992	16.3	0	0	0	0.00	66.61	0.00	1.82	13.22	2.47	0.00	12.96	664.94	110727.02	59.29	485.05
22/08/1992	19	0	0	0	0.00	64.31	0.00	2.20	13.18	2.93	0.00	12.96	678.90	112038.15	59.29	436.72
23/08/1992	21.8	0	0	0	0.00	71.69	0.00	2.49	13.15	3.30	0.00	12.96	692.86	113349.28	59.29	397.39
24/08/1992	21.3	13.6	0	13.6	0.00	70.82	0.00	2.49	13.11	3.30	10.30	12.96	706.84	114660.41	0.00	415.84
25/08/1992	23.3	0.4	0	0.4	0.00	78.11	0.00	2.81	13.08	3.69	0.00	12.96	720.82	115971.54	0.00	478.89
26/08/1992	23.5	0	0	0	0.00	78.69	0.00	2.81	13.04	3.68	0.00	12.96	734.80	117282.67	0.00	481.92
27/08/1992	22.3	4.8	0	4.8	0.00	73.37	0.00	2.64	13.01	3.47	1.13	12.96	748.78	118593.80	0.00	485.05
28/08/1992	20.3	28.8	0	28.8	0.00	67.89	0.00	2.34	12.97	3.08	25.72	12.96	433.04	73956.61	0.00	433.04
29/08/1992	19.8	0	0	0	0.00	65.53	0.00	1.71	12.94	2.88	0.00	12.96	446.00	75169.64	0.00	446.00
30/08/1992	19.3	4.2	0	4.2	0.00	65.14	0.00	2.20	12.91	2.89	1.31	12.96	458.27	76382.67	0.00	458.27
31/08/1992	19	0	0	0	0.00	64.31	0.00	2.20	12.87	2.88	0.00	12.96	470.54	77595.70	0.00	470.54
01/09/1992	19	0	0	0	0.00	66.08	0.00	1.82	12.84	2.89	0.00	12.96	482.81	78808.73	29.65	440.16
02/09/1992	17	8.4	0	8.4	0.00	63.85	0.00	1.84	12.80	2.85	6.85	12.96				

Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.25
 Elevation 175.3
 Climate Ic 6136606
 WMO Identifier
 TC Identifier

Max. Allowable Release: Summer, Winter 7000 L/min
 Spring, Fall 3500 L/min
 0.125 m³/s
 59.29 mm
 0.0625 m³/s
 29.65 mm

Groundwater Inflow 804,140 m³/yr
 2203.12 m³/day
 12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
 176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
21/09/1992	17.5	44.8	0	44.8	0.00	80.20	0.00	1.94	12.15	2.41	42.19	12.96	588.78	100092.31	0.00	588.78
22/09/1992	18.5	1.9	0	1.9	0.00	82.84	0.00	2.09	12.12	2.59	0.00	12.96	601.74	102795.44	0.00	601.74
23/09/1992	8	0	0	0	0.00	34.14	0.00	1.07	12.09	1.37	0.00	12.96	614.70	104498.58	0.00	614.70
24/09/1992	10.3	0	0	0	0.00	40.45	0.00	1.23	12.05	1.59	0.00	12.96	627.66	106201.72	29.65	598.01
25/09/1992	13	0	0	0	0.00	47.85	0.00	1.50	12.03	1.88	0.00	12.96	640.62	107904.86	29.65	568.32
26/09/1992	15.5	2.2	0	2.2	0.00	54.71	0.00	1.71	12.00	2.11	0.00	12.96	653.57	109608.00	0.00	653.57
27/09/1992	17.8	0.4	0	0.4	0.00	61.02	0.00	1.94	11.87	2.38	0.00	12.96	666.53	111311.14	0.00	666.53
28/09/1992	13.8	0	0	0	0.00	50.05	0.00	1.50	11.84	1.86	0.00	12.96	679.49	113014.28	29.65	650.84
29/09/1992	8.2	0	0	0	0.00	34.95	0.00	1.07	11.81	1.35	0.00	12.96	692.45	114717.42	29.65	673.95
30/09/1992	7.8	0	0	0	0.00	33.59	0.00	1.00	11.87	1.20	0.00	12.96	705.41	116420.56	29.65	697.06
01/10/1992	10.3	0	0	0	0.00	40.45	0.00	1.23	11.84	1.53	0.00	12.96	718.37	118123.70	29.65	720.17
02/10/1992	16.5	0	0	0	0.00	57.45	0.00	1.82	11.81	2.21	0.00	12.96	731.33	119826.84	29.65	743.28
03/10/1992	18.3	0	0	0	0.00	62.39	0.00	2.09	11.78	2.49	0.00	12.96	744.29	121529.98	29.65	766.39
04/10/1992	11.8	0	0	0	0.00	44.58	0.00	1.31	11.75	1.81	0.00	12.96	757.25	123233.12	29.65	789.50
05/10/1992	9	0	0	0	0.00	34.14	0.00	1.07	11.72	1.33	0.00	12.96	770.21	124936.26	29.65	812.61
06/10/1992	9.3	0	0	0	0.00	37.79	0.00	1.15	11.69	1.42	0.00	12.96	783.17	126639.40	29.65	835.72
07/10/1992	12.3	0	0	0	0.00	45.93	0.00	1.40	11.66	1.71	0.00	12.96	796.13	128342.54	29.65	858.83
08/10/1992	15.8	20	0	20	0.00	55.53	0.00	1.71	11.63	2.04	17.06	12.96	809.09	130045.68	0.00	881.94
09/10/1992	16.3	3.6	0	3.6	0.00	58.81	0.00	1.82	11.60	2.17	1.43	12.96	822.05	131748.82	0.00	905.05
10/10/1992	15.6	7.4	0	7.4	0.00	64.71	0.00	1.71	11.57	2.04	5.38	12.96	835.01	133451.96	0.00	928.16
11/10/1992	12.6	2	0	2	0.00	48.48	0.00	1.40	11.54	1.69	0.31	12.96	847.97	135155.10	0.00	951.27
12/10/1992	13	1.2	0	1.2	0.00	47.85	0.00	1.50	11.50	1.79	0.00	12.96	860.93	136858.24	0.00	974.38
13/10/1992	8	0	0	0	0.00	34.14	0.00	1.07	11.47	1.30	0.00	12.96	873.89	138561.38	0.00	997.49
14/10/1992	7.5	7	0	7	0.00	32.77	0.00	1.00	11.44	1.22	5.78	12.96	886.85	140264.52	0.00	1020.60
15/10/1992	13.3	10.2	0	10.2	0.00	48.68	0.00	1.50	11.41	1.78	8.42	12.96	899.81	141967.66	0.00	1043.71
16/10/1992	13.8	6.8	0	6.8	0.00	50.05	0.00	1.50	11.38	1.77	5.03	12.96	912.77	143670.80	0.00	1066.82
17/10/1992	5.3	0	0	0	0.00	28.73	0.00	0.87	11.35	1.08	0.00	12.96	925.73	145373.94	0.00	1090.93
18/10/1992	4	5	0	5	0.00	23.16	0.00	0.81	11.32	0.99	4.01	12.96	938.69	147077.08	0.00	1114.04
19/10/1992	1.8	0	0	0	0.00	12.13	0.00	0.59	11.29	0.60	0.00	12.96	951.65	148780.22	0.00	1137.15
20/10/1992	2.5	7	0	7	0.00	16.85	0.00	0.71	11.26	0.86	8.14	12.96	964.61	150483.36	0.00	1160.26
21/10/1992	6.3	0	0	0	0.00	28.47	0.00	0.84	11.23	1.12	0.00	12.96	977.57	152186.50	0.00	1183.37
22/10/1992	6	0	0	0	0.00	28.65	0.00	0.84	11.20	1.12	0.00	12.96	990.53	153889.64	29.65	1206.48
23/10/1992	10	1.4	0	1.4	0.00	38.82	0.00	1.23	11.16	1.44	0.00	12.96	1003.49	155592.78	0.00	1229.59
24/10/1992	10.8	4.4	0	4.4	0.00	41.82	0.00	1.23	11.13	1.43	2.97	12.96	1016.45	157295.92	0.00	1252.70
25/10/1992	6	0	0	0	0.00	28.65	0.00	0.84	11.10	1.11	0.00	12.96	1029.41	159000.06	0.00	1275.81
26/10/1992	8	0	0	0	0.00	27.28	0.00	0.87	11.07	1.03	0.00	12.96	1042.37	160704.20	29.65	1298.92
27/10/1992	6	0.2	0	0.2	0.00	28.65	0.00	0.84	11.04	1.10	0.00	12.96	1055.33	162408.34	29.65	1322.03
28/10/1992	7.8	0.8	0	0.8	0.00	33.59	0.00	1.00	11.01	1.17	0.00	12.96	1068.29	164112.48	0.00	1345.14
29/10/1992	10.5	0.8	0	0.8	0.00	41.00	0.00	1.23	10.98	1.42	0.00	12.96	1081.25	165816.62	0.00	1368.25
30/10/1992	5.8	0	0	0	0.00	28.10	0.00	0.87	10.95	1.02	0.00	12.96	1094.21	167520.76	0.00	1391.36
31/10/1992	4.3	0	0	0	0.00	23.89	0.00	0.81	10.92	0.95	0.00	12.96	1107.17	169224.90	29.65	1414.47
01/11/1992	3.8	14.8	0	14.8	0.00	22.62	0.00	0.78	10.89	0.89	13.71	12.96	1120.13	170929.04	0.00	1437.58
02/11/1992	7.3	14.4	0	14.4	0.00	32.22	0.00	1.00	10.86	1.16	13.24	12.96	1133.09	172633.18	0.00	1460.69
03/11/1992	12.5	1.4	0	1.4	0.00	48.48	0.00	1.40	10.83	1.58	0.00	12.96	1146.05	174337.32	0.00	1483.80
04/11/1992	10.6	6.8	0	6.8	0.00	41.00	0.00	1.23	10.79	1.39	5.21	12.96	1159.01	176041.46	0.00	1506.91
05/11/1992	4.3	8.8	0	8.8	0.00	23.89	0.00	0.81	10.76	0.94	7.89	12.96	1171.97	177745.60	0.00	1530.02
06/11/1992	2.5	0	0	0	0.00	19.05	0.00	0.71	10.73	0.82	0.00	12.96	1184.93	179449.74	0.00	1553.13
07/11/1992	-0.6	0	0	0	0.00	9.00	0.00	0.59	10.70	0.68	0.00	12.96	1197.89	181153.88	29.65	1576.24
08/11/1992	-0.5	0	0	0	0.00	0.00	0.00	0.58	10.67	0.66	0.00	12.96	1210.85	182858.02	29.65	1600.00
09/11/1992	2.8	0.8	0	0.8	0.00	19.87	0.00	0.71	10.64	0.81	0.00	12.96	1223.81	184562.16	0.00	1623.11
10/11/1992	8.5	1.8	0	1.8	0.00	35.81	0.00	1.07	10.61	1.20	0.60	12.96	1236.77	186266.30	0.00	1646.22
11/11/1992	9.8	5.8	0	5.8	0.00	30.08	0.00	1.15	10.58	1.28	4.62	12.96	1249.73	187970.44	0.00	1669.33
12/11/1992	10.8	18.8	0	18.8	0.00	41.82	0.00	1.23	10.55	1.38	17.24	12.96	1262.69	189674.58	0.00	1692.44
13/11/1992	9	0	1	1	1.00	20.42	1.00	0.78	10.52	0.86	0.14	12.96	1275.65	191378.72	0.00	1715.55
14/11/1992	0.5	0	0	0	0.00	0.00	0.00	0.61	10.49	0.70	0.00	12.96	1288.61	193082.86	0.00	1738.66
15/11/1992	-0.5	0	1	1	1.00	0.00	0.00	0.58	10.46	0.66	0.00	12.96	1301.57	194787.00	29.65	1761.77
16/11/1992	-1	4.8	10	14.8	11.00	0.00	0.00	0.58	10.42	0.68	3.84	12.96	1314.53	196491.14	0.00	1784.88
17/11/1992	0.8	1	0	1	11.00	0.00	0.00	0.61	10.39	0.69	0.31	12.96	1327.49	198195.28	0.00	1807.99
18/11/1992	2.3	0	0	0	11.00	18.50	11.00	0.71	10.36	0.79	10.21	12.96	1340.45	199900.42	0.00	1831.10
19/11/1992	1.5	0	0	0	0.00	18.31	0.00	0.66	10.33	0.74	0.00	12.96	1353.41	201604.56	0.00	1854.21
20/11/1992	4.3	0	0	0	0.00	23.89	0.00	0.81	10.30	0.90	0.00	12.96	1366.37	203308.70	29.65	1877.32
21/11/1992	8.8	1.4	0	1.4	0.00	38.33	0.00	1.07	10.27	1.16	0.24	12.96	1379.33	205012.84	0.00	1900.43
22/11/1992	8.3	2.0	0	2.0	0.00	34.95	0.00	1.07	10.24	1.10	19.84	12.96	1392.29	206716.98	0.00	1923.54
23/11/1992	6.5	1.8	0	1.8	0.00	30.02	0.00	0.84	10.21	1.02	0.58	12.96	1405.25	208421.12	0.00	1946.65
24/11/1992	5.3	0.8	0	0.8	0.00	28.73	0.00	0.87	10.18	0.95	0.55	12.96	1418.21	210125.26	0.00	1969.76
25/11/1992	8	0.4	0	0.4	0.00	34.14	0.00	1.07	10.15	1.15	0.00	12.96	1431.17	211829.40	0.00	1992.87
26/11/1992	6	0.8	0	0.8	0.00	38.89	0.00	1.15	10.12	1.23	0.00	12.96	1444.13	213533.54	0.00	2015.98
27/11/1992	4.3	0	0	0	0.00	23.89	0.00	0.81	10.09	0.86	0.00	12.96	1457.09	215237.68	0.00	2039.09
28/11/1992	4	0.4	0	0.4	0.00	23.16	0.00	0.81	10.06	0.89	0.00	12.				

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate Id: 6136606
WMO Identifier
TC Identifier

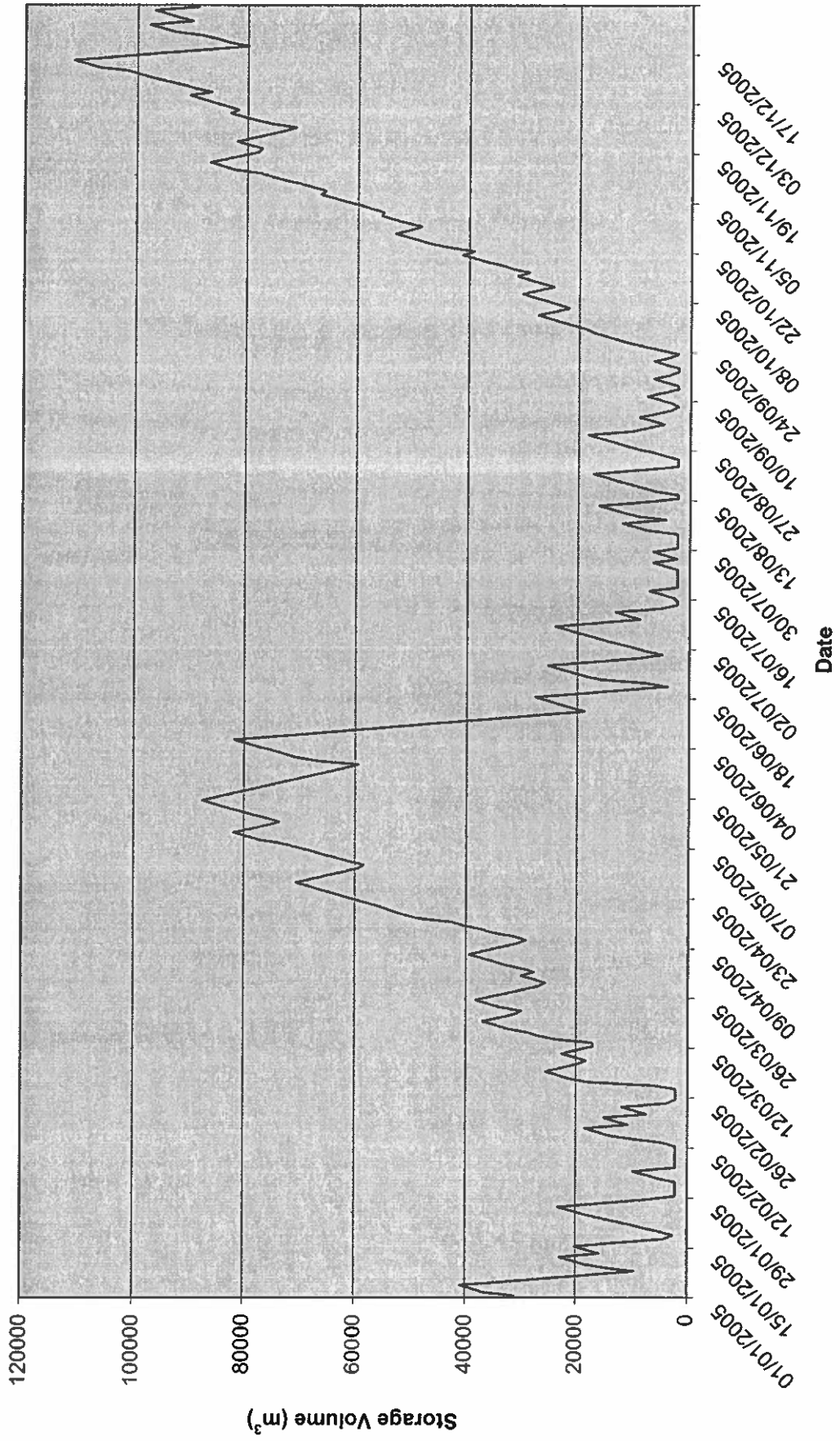
Max. Allowable Release: Summer, Winter 7000 L/min
Spring, Fall 3500 L/min
0.125 m³/s
0.0625 m³/s
59.29 mm
29.65 mm

Groundwater Inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
18/12/1992	1.5	0	0	0	0.00	18.31	0.00	0.69	9.44	0.67	0.00	12.96	620.79	105534.64	0.00	620.79
19/12/1992	2.8	7.5	0	7.5	0.00	19.87	0.00	0.71	9.41	0.72	6.78	12.96	640.53	108990.87	0.00	640.53
20/12/1992	-1	0	0	0	0.00	0.00	0.00	0.58	9.38	0.80	0.00	12.96	652.49	111094.00	0.00	652.49
21/12/1992	-1.3	0	0	0	0.00	0.00	0.00	0.58	9.34	0.80	0.00	12.96	666.45	113297.12	59.29	607.16
22/12/1992	2.3	0.2	0	0.2	0.00	19.50	0.00	0.71	9.31	0.71	0.00	12.96	620.12	105420.24	59.29	560.82
23/12/1992	7	0	1	1	1.00	17.66	1.00	0.71	9.28	0.71	0.29	12.96	674.97	97592.73	0.00	674.97
24/12/1992	-6.5	0	0	0	0.00	0.00	0.00	0.45	9.25	0.45	0.00	12.96	587.05	99795.85	0.00	587.05
25/12/1992	-4	0	0	0	0.00	0.00	0.00	0.52	9.22	0.54	0.00	12.96	599.09	101998.87	59.29	540.79
26/12/1992	-6.3	0	0	0	0.00	0.00	0.00	0.38	9.19	0.39	0.00	12.96	552.86	94122.09	59.29	493.57
27/12/1992	-6.3	0	0	0	0.00	0.00	0.00	0.47	9.16	0.48	0.00	12.96	507.32	86245.22	59.29	448.03
28/12/1992	2	0	0	0	0.00	17.88	0.00	0.71	9.13	0.70	0.00	12.96	460.89	78368.34	59.29	401.70
29/12/1992	4.3	11	0	11	0.00	23.89	0.00	0.81	9.10	0.79	10.21	12.96	424.86	72228.43	0.00	424.86
30/12/1992	9.8	24	0	24	0.00	27.28	0.00	0.87	9.07	0.85	23.13	12.96	460.68	78365.85	0.00	460.68
31/12/1992	8	0	0	0	0.00	28.65	0.00	0.84	9.07	0.90	0.00	12.96	473.84	80588.87	0.00	473.84

**Storage Volumes- Phase 1A (Worst Case Groundwater Inflow)
1972 - Lowest Year Recorded**



Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province: ONTARIO
 Latitude: 42.88
 Longitude: -79.25
 Elevation: 175.3
 Climate I: 6136606
 WMO Identifier:
 TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 59.29 mm 29.65 mm

Groundwater Inflow 804,140 m³/yr
 2203.12 m³/day
 12.96 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 1037.87 mm
 176436 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/01/1972	-0.6	2.5	0	2.5	17.80	0.00	0.00	0.58	9.07	0.58	1.82	12.89	182.82	31046.00	0.00	182.82
02/01/1972	1.7	2.8	0	2.8	17.80	18.88	18.88	0.68	9.11	0.85	18.01	12.89	214.59	36480.28	0.00	214.59
03/01/1972	0.8	0	0	0	0.84	0.00	0.00	0.81	9.15	0.81	0.00	12.89	227.55	36883.40	0.00	227.55
04/01/1972	-0.3	0	12.2	12.2	13.14	0.00	0.00	0.88	9.19	0.88	0.00	12.89	240.61	40885.63	59.29	181.21
05/01/1972	-0.1	0	5.8	5.8	19.94	0.00	0.00	0.38	9.23	0.80	0.00	12.89	164.17	33006.85	59.29	134.88
06/01/1972	-2.2	0	8.8	8.8	22.64	0.00	0.00	0.41	9.27	0.43	0.00	12.89	147.84	25132.77	59.29	88.55
07/01/1972	0	0	0	0	27.54	0.00	0.00	0.81	9.31	0.82	0.00	12.89	101.51	17255.90	59.29	42.21
08/01/1972	-0.6	1.3	0	1.3	27.54	0.00	0.00	0.68	9.35	0.69	0.71	12.89	55.88	9496.94	0.00	55.88
09/01/1972	1.9	0.8	0	0.8	27.54	17.40	17.40	0.98	9.39	0.87	17.54	12.89	86.37	14883.20	0.00	86.37
10/01/1972	4.2	0	0	0	19.14	23.71	19.14	0.81	9.43	0.82	0.32	12.89	108.65	18476.29	0.00	108.65
11/01/1972	2.3	0	0	0	0.00	18.50	0.00	0.71	9.47	0.72	0.00	12.89	121.81	20873.36	0.00	121.81
12/01/1972	3.9	0	0	0	0.00	22.89	0.00	0.78	9.51	0.77	0.00	12.89	194.97	23786.99	59.29	75.77
13/01/1972	3.9	1.3	3.8	5.1	3.80	22.89	3.80	0.78	9.55	0.78	4.32	12.89	92.55	15734.35	0.00	92.55
14/01/1972	-0.2	0	1.3	1.3	1.30	0.00	0.00	0.44	9.59	0.47	0.00	12.89	105.51	17837.47	0.00	105.51
15/01/1972	-18.1	0	0	0	1.30	0.00	0.00	0.17	9.63	0.16	0.00	12.89	118.47	20140.69	59.29	59.18
16/01/1972	-12.8	0	1	1	2.30	0.00	0.00	0.28	9.67	0.27	0.00	12.89	72.14	12763.72	59.29	12.85
17/01/1972	-4.2	0	0	0	2.30	0.00	0.00	0.50	9.70	0.53	0.00	12.89	25.89	4388.84	59.29	0.00
18/01/1972	2.8	0.8	0	0.8	2.30	18.87	2.30	0.71	9.74	0.74	2.54	12.89	110.95	19759.47	0.00	110.95
19/01/1972	1.4	0	1	1	1.00	18.83	1.00	0.68	9.78	0.70	0.30	12.89	28.28	4807.37	0.00	28.28
20/01/1972	-0.8	5.3	2	7.1	2.00	0.00	0.00	0.58	9.82	0.63	4.47	12.89	45.71	7771.16	0.00	45.71
21/01/1972	-2.8	0	0	0	2.00	0.00	0.00	0.58	9.86	0.60	0.00	12.89	58.87	9874.28	0.00	58.87
22/01/1972	-0.3	5.3	0	5.3	2.00	0.00	0.00	0.58	9.90	0.63	4.67	12.89	79.39	12871.41	0.00	79.39
23/01/1972	1.1	0	4.3	4.3	8.30	15.21	8.30	0.99	9.94	0.71	5.59	12.89	94.65	16724.87	0.00	94.65
24/01/1972	2.5	0	3.3	3.3	3.30	18.05	3.30	0.71	9.98	0.79	2.54	12.89	110.95	19759.47	0.00	110.95
25/01/1972	-1.7	0	0	0	0.00	0.00	0.00	0.44	10.02	0.48	0.00	12.89	123.31	20882.86	0.00	123.31
26/01/1972	-12.8	0	0.5	0.5	0.50	0.00	0.00	0.25	10.06	0.26	0.00	12.89	136.27	23185.77	59.29	76.97
27/01/1972	-6.7	0	9.7	9.7	19.20	0.00	0.00	0.29	10.10	0.33	0.00	12.89	89.83	15288.84	59.29	30.84
28/01/1972	-8.1	0	0	0	19.20	0.00	0.00	0.38	10.14	0.43	0.00	12.89	43.80	7411.06	59.29	0.00
29/01/1972	-10.3	0	0.8	0.8	11.00	0.00	0.00	0.27	10.18	0.32	0.00	12.89	12.88	2203.12	59.29	0.00
30/01/1972	-6.2	0	0	0	11.00	0.00	0.00	0.29	10.22	0.33	0.00	12.89	12.88	2203.12	59.29	0.00
31/01/1972	-8.8	0	1.8	1.8	12.80	0.00	0.00	0.38	10.26	0.44	0.00	12.89	12.88	2203.12	59.29	0.00
01/02/1972	-6.4	0	0	0	12.80	0.00	0.00	0.44	10.30	0.50	0.00	12.89	12.88	2203.12	59.29	0.00
02/02/1972	-2	0	1	1	13.80	0.00	0.00	0.68	10.34	0.66	0.00	12.89	12.88	2203.12	59.29	0.00
03/02/1972	1.1	4.3	1.3	5.6	15.10	15.21	15.10	0.98	10.38	0.74	18.88	12.89	31.82	5375.14	0.00	31.82
04/02/1972	-6.7	0	1.5	1.5	1.50	0.00	0.00	0.44	10.42	0.51	0.00	12.89	44.68	7879.26	0.00	44.68
05/02/1972	-10.8	0	5.3	5.3	6.80	0.00	0.00	0.27	10.46	0.32	0.00	12.89	87.84	9781.89	59.29	0.00
06/02/1972	-7.8	0	5.8	5.8	12.40	0.00	0.00	0.41	10.50	0.48	0.00	12.89	12.88	2203.12	59.29	0.00
07/02/1972	-11.7	0	0	0	12.40	0.00	0.00	0.28	10.54	0.31	0.00	12.89	12.88	2203.12	59.29	0.00
08/02/1972	-12.5	0	0	0	12.40	0.00	0.00	0.25	10.58	0.30	0.00	12.89	12.88	2203.12	59.29	0.00
09/02/1972	-10.9	0	0	0	12.40	0.00	0.00	0.27	10.62	0.33	0.00	12.89	12.88	2203.12	59.29	0.00
10/02/1972	-10	0	0	0	12.40	0.00	0.00	0.28	10.65	0.35	0.00	12.89	12.88	2203.12	59.29	0.00
11/02/1972	-9.5	0	0	0	12.40	0.00	0.00	0.29	10.70	0.35	0.00	12.89	12.88	2203.12	59.29	0.00
12/02/1972	-2.5	0	0	0	12.40	0.00	0.00	0.35	10.74	0.35	0.00	12.89	12.88	2203.12	59.29	0.00
13/02/1972	-6	0	14.5	14.5	30.7	28.70	0.00	0.81	10.78	0.72	13.78	12.89	26.74	4548.05	0.00	26.74
14/02/1972	1.7	0	0	0	28.70	18.88	18.88	0.98	10.82	0.77	18.08	12.89	55.70	9483.87	0.00	55.70
15/02/1972	1.1	2.8	0	2.8	11.84	15.21	11.84	0.98	10.86	0.78	13.87	12.89	82.81	14044.46	0.00	82.81
16/02/1972	-4.8	0	0	0	0.00	0.00	0.00	0.50	10.90	0.80	0.00	12.89	95.87	16247.80	0.00	95.87
17/02/1972	-4.5	0	0	0	0.00	0.00	0.00	0.50	10.94	0.80	0.00	12.89	108.53	18450.73	59.29	48.24
18/02/1972	-1.1	0.8	4.8	5.6	4.80	0.00	0.00	0.38	10.98	0.70	0.10	12.89	62.30	10980.87	0.00	62.30
19/02/1972	-1.1	0	3.8	3.8	38.30	0.00	0.00	0.32	11.02	0.64	0.00	12.89	75.91	13784.05	0.00	75.91
20/02/1972	-11.7	0	1.8	1.8	38.80	0.00	0.00	0.28	11.06	0.33	0.00	12.89	88.22	14897.12	59.29	28.92
21/02/1972	-6.2	2	0	2	38.80	0.00	0.00	0.44	11.10	0.64	1.46	12.89	43.34	7387.86	0.00	43.34
22/02/1972	-10.3	0	0	0	38.80	0.00	0.00	0.27	11.14	0.35	0.00	12.89	56.30	9570.88	0.00	56.30
23/02/1972	-7.5	0	2.5	2.5	42.30	0.00	0.00	0.41	11.18	0.51	0.00	12.89	69.26	11774.11	59.29	9.97
24/02/1972	-2	0	1.8	1.8	44.10	0.00	0.00	0.58	11.22	0.72	0.60	12.89	22.87	3887.23	59.29	0.00
25/02/1972	-4.3	0	5.1	5.1	48.20	0.00	0.00	0.50	11.26	0.62	0.00	12.89	12.88	2203.12	59.29	0.00
26/02/1972	-2.8	0	0	0	48.20	0.00	0.00	0.55	11.30	0.66	0.00	12.89	12.88	2203.12	59.29	0.00
27/02/1972	-4.5	0	1.8	1.8	51.00	0.00	0.00	0.50	11.34	0.62	0.00	12.89	12.88	2203.12	59.29	0.00
28/02/1972	0.8	0	0	0	51.00	0.00	0.00	0.81	11.38	0.76	0.00	12.89	12.88	2203.12	59.29	0.00
29/02/1972	4.2	0	0	0	51.00	23.71	23.71	0.81	11.42	1.00	22.72	12.89	35.88	6084.88	0.00	35.88
01/03/1972	4.2	34	0	34	27.29	23.71	23.71	0.81	11.46	1.00	86.71	12.89	105.35	17909.12	0.00	105.35
02/03/1972	-1.7	8.9	2.3	8.1	5.87	0.00	0.00	0.58	11.50	0.73	8.17	12.89	124.47	21160.38	0.00	124.47
03/03/1972	-3.7	9	0.5	9.5	9.37	0.00	0.00	0.38	11.54	0.50	0.00	12.89	137.43	23953.80	0.00	137.43
04/03/1972	-6.4	0	4.1	4.1	10.47	0.00	0.00	0.44	11.58	0.57	0.00	12.89	150.39	25985.63	29.63	120.74
05/03/1972	-6.4	0	3	3	13.47	0.00	0.00	0.44	11.62	0.57	0.00	12.89	133.70	22728.75	29.63	104.06
06/03/1972	-4.5	0	5.1	5.1	16.57	0.00	0.00	0.50	11.66	0.64	0.00	12.89	117.02	18882.87	29.63	87.37
07/03/1972	-0.3	7.4	0.5	7.9	19.07	0.00	0.00	0.98	11.70	0.74	8.96	12.89	108.69	18187.81	0.00	108.69
08/03/1972	-6.7	0	0	0	19.07	0.00	0.00	0.44	11.74	0.68	0.00	12.89	119.85	20380.74	0.00	119.85
09/03/1972	-8.9	0	0	0	19.07	0.00	0.00	0.38	11.78	0.51	0.00	12.89	135.81	22583.86	29.63	106.18
10/03/1972	-2.7	0	0	0	19.07	0.00	0.00	0.44	11.82	0.68	0.00	12.89	151.67	25756.89	29.63	86.57
11/03/1972	-2.8	0	0	0	19.07	0.00	0.00									

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate k: 613606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/a 0.0625 m³/a
59.29 mm 29.65 mm

Groundwater inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
2803/1972	1.4	2.6	0	2.6	7.60	19.93	7.60	0.95	12.52	0.89	0.21	12.09	150.95	25812.83	0.00	150.95
3003/1972	2.3	0	0	0.00	18.50	0.00	0.71	12.56	0.96	0.00	12.09	163.62	27819.24	0.00	163.62	
3103/1972	1.4	0	0	0.00	19.00	0.00	0.66	12.59	0.90	0.00	12.09	176.69	30019.08	28.65	146.94	
3103/1972	3.9	3.6	0	3.6	0.00	22.89	0.00	0.78	12.53	1.03	2.57	12.98	192.47	27819.24	0.00	192.47
0204/1972	0.6	0	0	0.00	0.00	0.00	0.01	12.59	0.84	0.00	12.09	175.43	29522.39	0.00	175.43	
0304/1972	0.6	5.8	0	5.8	0.00	0.00	0.01	12.69	0.84	4.78	12.09	193.14	32334.07	0.00	193.14	
0404/1972	1.7	0	0.5	0.5	0.50	15.80	0.50	0.85	12.73	0.91	0.00	12.09	205.10	35037.19	0.00	205.10
0504/1972	-0.6	0	0	0.00	0.00	0.00	0.68	12.76	0.81	0.00	12.09	219.06	37240.32	0.00	219.06	
0604/1972	-2	0	7.1	7.1	7.10	0.00	0.00	0.58	12.80	0.82	0.00	12.09	232.02	39443.44	29.65	202.37
0704/1972	-4.4	0	0	0	7.10	0.00	0.00	0.44	12.83	0.83	0.00	12.09	215.33	36605.66	29.65	185.69
0804/1972	-4.3	0	0	0	7.10	0.00	0.00	0.47	12.85	0.87	0.00	12.09	199.53	33799.89	29.65	169.89
0904/1972	-3.8	0	0	0	7.10	0.00	0.00	0.52	12.90	0.75	0.00	12.09	181.99	30933.61	29.65	152.31
1004/1972	1.7	0	0	0	7.10	19.88	7.10	0.68	12.93	0.82	0.18	12.09	171.45	29148.36	0.00	171.45
1104/1972	4.8	0	0	0.00	25.39	0.00	0.81	12.97	1.13	0.00	12.09	184.41	31349.46	0.00	184.41	
1204/1972	7.2	10.4	0	10.4	0.00	31.84	0.00	1.00	13.00	1.39	0.02	12.09	206.38	35085.26	0.00	206.38
1304/1972	7.9	0.3	0	0.3	0.00	32.77	0.00	1.00	13.03	1.39	0.00	12.09	219.34	37289.38	0.00	219.34
1404/1972	9.7	5.8	0	5.8	0.00	36.67	0.00	0.84	13.07	1.30	4.60	12.09	236.80	40258.38	0.00	236.80
1504/1972	10.3	0.9	0	0.9	0.00	49.45	0.00	1.23	13.10	1.60	0.69	12.09	249.79	42459.47	0.00	249.79
1604/1972	3.6	24.8	0	24.8	0.00	22.07	0.00	0.78	13.14	1.07	23.53	12.09	285.25	48662.36	0.00	285.25
1704/1972	4.2	0	0	0.00	23.71	0.00	0.81	13.17	1.15	0.90	12.09	299.21	50895.48	0.00	299.21	
1804/1972	9.2	0	0	0.00	37.43	0.00	1.15	13.20	1.60	0.00	12.09	312.17	53088.80	29.65	282.52	
1904/1972	9.4	28.4	0	28.4	0.00	37.99	0.00	1.15	13.24	1.60	28.80	12.09	322.26	54787.28	0.00	322.26
2004/1972	9.7	0	0	0.00	39.63	0.00	0.84	13.27	1.52	0.00	12.09	335.24	56999.40	0.00	335.24	
2104/1972	5.3	1.5	0	1.5	0.00	28.73	0.00	0.87	13.31	1.24	0.29	12.09	349.49	59237.46	0.00	349.49
2204/1972	6.6	3.3	0	3.3	0.00	27.55	0.00	0.87	13.34	1.24	2.09	12.09	363.47	61799.23	0.00	363.47
2304/1972	5	0	0	0.00	25.91	0.00	0.87	13.37	1.25	0.00	12.09	376.43	63993.36	0.00	376.43	
2404/1972	4.2	0.5	0	0.5	0.00	23.71	0.00	0.81	13.41	1.17	0.00	12.09	389.39	66196.46	0.00	389.39
2504/1972	3.1	0	0	0.00	20.79	0.00	0.76	13.44	1.10	0.00	12.09	402.35	68399.00	0.00	402.35	
2604/1972	2.8	0	0	0.00	18.87	0.00	0.71	13.48	1.03	0.00	12.09	415.31	70602.73	29.65	385.66	
2704/1972	4.7	0	0	0.00	25.99	0.00	0.81	13.51	1.18	0.00	12.09	428.26	72806.46	29.65	398.61	
2804/1972	5	0	0	0.00	25.91	0.00	0.87	13.55	1.27	0.00	12.09	441.21	75010.19	29.65	411.56	
2904/1972	6.1	0	0	0.00	34.41	0.00	1.07	13.58	1.64	0.00	12.09	454.17	77213.92	29.65	431.52	
3004/1972	11.4	0	0	0.00	49.46	0.00	1.31	13.61	1.87	0.00	12.09	467.12	79417.65	29.65	451.47	
0105/1972	12.3	13.2	0	13.2	0.00	45.93	0.00	1.40	13.65	2.00	11.70	12.09	480.07	81621.38	0.00	480.07
0205/1972	13.1	8.8	0	8.8	0.00	48.18	0.00	1.60	13.68	2.13	4.47	12.09	493.02	83825.11	0.00	493.02
0305/1972	9.7	0	0	0.00	39.63	0.00	1.15	13.74	1.60	0.00	12.09	505.97	86028.84	0.00	505.97	
0405/1972	7.5	4.1	0	4.1	0.00	32.77	0.00	1.00	13.75	1.46	2.84	12.09	518.92	88232.57	0.00	518.92
0505/1972	8.4	0	0	0.00	35.23	0.00	1.07	13.78	1.57	0.00	12.09	531.87	90436.30	0.00	531.87	
0605/1972	9.8	3.3	0	3.3	0.00	36.08	0.00	1.15	13.82	1.67	1.83	12.09	544.82	92639.03	0.00	544.82
0705/1972	8.1	4.1	0	4.1	0.00	28.83	0.00	0.84	13.85	1.36	2.72	12.09	557.77	94842.76	0.00	557.77
0805/1972	7	11.4	0	11.4	0.00	31.39	0.00	1.00	13.89	1.48	9.92	12.09	570.72	97046.49	0.00	570.72
0905/1972	10	0	0	0.00	39.63	0.00	1.23	13.92	1.80	0.00	12.09	583.67	99250.22	0.00	583.67	
1005/1972	7.9	0	0	0.00	33.86	0.00	1.00	13.95	1.64	0.00	12.09	596.62	101453.95	0.00	596.62	
1105/1972	11.4	0	0	0.00	43.49	0.00	1.31	13.99	1.92	0.00	12.09	609.57	103657.68	0.00	609.57	
1205/1972	9.8	0	0	0.00	39.08	0.00	1.15	14.02	1.70	0.00	12.09	622.52	105861.41	29.65	609.87	
1305/1972	15.9	4.8	0	4.8	0.00	55.81	0.00	1.71	14.06	2.47	2.13	12.09	635.47	108065.14	0.00	635.47
1405/1972	13.9	0.3	0	0.3	0.00	50.32	0.00	1.50	14.09	2.19	0.00	12.09	648.42	110268.87	0.00	648.42
1505/1972	13.1	4.3	0	4.3	0.00	48.18	0.00	1.50	14.12	2.20	2.10	12.09	661.37	112472.60	0.00	661.37
1605/1972	11.7	0.8	0	0.8	0.00	44.29	0.00	1.31	14.15	1.84	0.29	12.09	674.32	114676.33	0.00	674.32
1705/1972	11.1	3.8	0	3.8	0.00	42.64	0.00	1.31	14.19	1.85	1.85	12.09	687.27	116880.06	0.00	687.27
1805/1972	13.9	0	0	0.00	50.32	0.00	1.60	14.23	2.21	0.00	12.09	700.22	119083.79	0.00	700.22	
1905/1972	17.9	0	0	0.00	61.02	0.00	1.84	14.26	2.83	0.00	12.09	713.17	121287.52	29.65	680.52	
2005/1972	15.9	0	0	0.00	55.81	0.00	1.71	14.29	2.51	0.00	12.09	726.12	123491.25	29.65	660.82	
2105/1972	13.1	0	0	0.00	48.18	0.00	1.60	14.33	2.23	0.00	12.09	739.07	125694.98	29.65	641.12	
2205/1972	18.7	0	0	0.00	63.86	0.00	2.05	14.36	3.03	0.00	12.09	752.02	127898.71	29.65	621.37	
2305/1972	19.7	0	0	0.00	59.00	0.00	1.92	14.40	2.99	0.00	12.09	764.97	130102.44	29.65	601.62	
2405/1972	19.5	0	0	0.00	65.68	0.00	2.20	14.43	3.23	0.00	12.09	777.92	132306.17	29.65	581.87	
2505/1972	17.2	0	0	0.00	58.38	0.00	1.84	14.46	2.88	0.00	12.09	790.87	134509.90	29.65	562.12	
2605/1972	17.5	0	0	0.00	60.20	0.00	1.84	14.50	2.88	0.00	12.09	803.82	136713.63	29.65	542.37	
2705/1972	17.8	0	0	0.00	61.02	0.00	1.84	14.53	2.88	0.00	12.09	816.77	138917.36	29.65	522.62	
2805/1972	18.1	0	0	0.00	61.84	0.00	2.08	14.57	3.08	0.00	12.09	829.72	141121.09	29.65	502.87	
2905/1972	19.2	4.3	0	4.3	0.00	59.08	0.00	1.92	14.61	2.84	0.00	12.09	842.67	143324.82	29.65	483.12
3005/1972	17.5	32.5	0	32.5	0.00	60.20	0.00	1.84	14.63	2.81	26.59	12.09	855.62	145528.55	0.00	463.37
3105/1972	13.9	12.2	0	12.2	0.00	60.32	0.00	1.50	14.67	2.28	0.82	12.09	868.57	147732.28	0.00	443.62
0106/1972	9.2	2	0	2	0.00	37.43	0.00	1.15	14.70	1.78	0.22	12.09	881.52	149936.01	0.00	423.87
0206/1972	12.2	0	0	0.00	45.93	0.00	1.40	14.74	2.18	0.00	12.09	894.47	152139.74	0.00	404.12	
0306/1972	14.7	3.8	0	3.8	0.00	52.82	0.00	1.60	14.77	2.44	1.39	12.09	907.42	154343.47	0.00	384.37
0406/1972	17.8	0	0	0.00	61.84	0.00	1.84	14.81	2.84	0.00	12.09	920.37	156547.20	0.00	364.62	
0506/1972	17	0	0	0.00	58.83	0.00	1.84	14.84	2.85	0.00	12.09	933.32	158750.93	0.00	344.87	
0606/1972	16.4	0	0	0.00	57.18	0.00	1.82	14.87	2.78	0.00	12.09	946.27	160954.66	0.00	325.12	
0706/1972	16.4	0	0	0.00	57.18	0.00	1.82	14.91	2.79	0.00	12.09	959.22	163158.39	0.00	305.37	
0806/1972	15.9	0	0	0.00	54.89	0.00	1.71	14.94	2.53							

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate Id: 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter 7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
59.29 mm 29.65 mm

Groundwater Inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.67 mm
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
25/09/1972	15	0	0	0	0	53.34	0.00	1.71	15.18	2.88	0.00	12.96	136.05	23130.22	0.00	136.05
26/09/1972	13.9	0	0	0	0	50.32	0.00	1.50	15.14	2.35	0.00	12.96	149.02	25333.34	59.29	89.73
27/09/1972	18.4	0	0	0	0	67.18	0.00	1.82	15.11	2.83	0.00	12.96	102.90	17456.46	59.29	43.39
28/09/1972	21.4	0	0	0	0	70.89	0.00	2.49	15.07	3.79	0.00	12.96	66.25	9579.69	59.29	0.00
29/09/1972	20.8	18.8	0	18.8	0	66.79	0.00	2.34	15.04	3.67	18.23	12.96	28.19	4792.87	0.00	28.19
30/09/1972	17.8	7.1	0	7.1	0	61.02	0.00	1.94	15.01	2.98	4.12	12.96	45.27	7988.52	0.00	45.27
01/10/1972	17.5	0	0	0	0	60.20	0.00	1.94	14.97	2.97	0.00	12.96	58.23	9889.64	0.00	58.23
02/10/1972	21.7	4.8	0	4.8	0	71.72	0.00	2.49	14.94	3.75	9.85	12.96	72.04	12246.81	0.00	72.04
03/10/1972	15.3	5.8	0	5.8	0	54.18	0.00	1.71	14.90	2.82	2.88	12.96	87.67	14855.61	0.00	87.67
04/10/1972	14.5	0	0	0	0	51.87	0.00	1.60	14.87	2.48	0.00	12.96	100.83	17188.84	0.00	100.83
05/10/1972	15.3	3.8	0	3.8	0	64.39	0.00	1.71	14.83	2.81	1.16	12.96	118.58	19553.89	0.00	118.58
06/10/1972	16.4	0	0	0	0	67.18	0.00	1.82	14.80	2.77	0.00	12.96	138.04	21788.72	0.00	138.04
07/10/1972	17.4	0	0	0	0	68.83	0.00	1.94	14.76	2.84	0.00	12.96	141.00	23989.85	59.29	81.70
08/10/1972	18.4	0	0	0	0	62.67	0.00	2.08	14.73	3.11	0.00	12.96	84.86	18092.87	59.29	35.37
09/10/1972	20.3	7.1	0	7.1	0	67.69	0.00	2.34	14.70	3.40	3.81	12.96	51.84	8826.81	0.00	51.84
10/10/1972	19.8	0	0	0	0	65.88	0.00	2.20	14.68	3.28	0.00	12.96	64.89	11033.04	0.00	64.89
11/10/1972	21.4	0	0	0	0	70.89	0.00	2.49	14.63	3.88	0.00	12.96	77.88	13236.18	59.29	18.67
12/10/1972	25.8	0	0	0	0	80.77	0.00	3.17	14.59	4.82	0.00	12.96	51.84	8359.28	59.29	0.00
13/10/1972	22.8	0	0	0	0	74.74	0.00	2.84	14.56	3.88	0.00	12.96	12.86	2203.12	59.29	0.00
14/10/1972	22.2	0	0	0	0	73.09	0.00	2.84	14.52	3.87	0.00	12.96	12.86	2203.12	59.29	0.00
15/10/1972	23.4	7.9	0	7.9	0	78.38	0.00	2.81	14.49	4.09	3.81	12.96	18.77	2850.70	0.00	18.77
16/10/1972	21.7	0	0	0	0	71.72	0.00	2.49	14.45	3.83	0.00	12.96	29.73	5053.82	0.00	29.73
17/10/1972	23.8	0	0	0	0	78.93	0.00	2.81	14.42	4.07	0.00	12.96	42.89	7256.84	59.29	0.00
18/10/1972	24.8	0	0	0	0	82.42	0.00	3.17	14.39	4.84	0.00	12.96	12.86	2203.12	59.29	0.00
19/10/1972	24.8	0	0	0	0	80.22	0.00	2.89	14.35	4.28	0.00	12.96	12.86	2203.12	59.29	0.00
20/10/1972	25.3	0	0	0	0	81.59	0.00	3.17	14.32	4.63	0.00	12.96	12.86	2203.12	59.29	0.00
21/10/1972	25.8	0	0	0	0	82.42	0.00	3.17	14.28	4.81	0.00	12.96	12.86	2203.12	59.29	0.00
22/10/1972	24.2	0	0	0	0	78.58	0.00	2.89	14.25	4.28	0.00	12.96	12.86	2203.12	59.29	0.00
23/10/1972	24.2	1.3	0	1.3	0	78.58	0.00	2.89	14.21	4.25	0.00	12.96	12.86	2203.12	0.00	12.86
24/10/1972	22.3	0	0	0	0	73.37	0.00	2.84	14.18	3.78	0.00	12.96	25.82	4469.23	0.00	25.82
25/10/1972	21.7	0.3	0	0.3	0	74.74	0.00	2.84	14.15	3.84	0.00	12.96	48.86	8699.37	59.29	0.00
26/10/1972	17.9	1	0	1	0	61.02	0.00	1.94	14.11	2.80	0.00	12.96	12.86	2203.12	0.00	12.86
27/10/1972	18.3	0	0	0	0	62.39	0.00	2.08	14.08	2.87	0.00	12.96	25.82	4468.25	0.00	25.82
28/10/1972	18.4	0	0	0	0	62.67	0.00	2.08	14.04	2.86	0.00	12.96	38.88	6909.37	59.29	0.00
29/10/1972	19.8	0	0	0	0	66.81	0.00	2.20	14.01	3.13	0.00	12.96	12.86	2203.12	59.29	0.00
30/10/1972	21.7	0	0	0	0	71.72	0.00	2.49	13.97	3.51	0.00	12.96	12.86	2203.12	59.29	0.00
31/10/1972	22.8	0	0	0	0	74.74	0.00	2.84	13.94	3.74	0.00	12.96	12.86	2203.12	59.29	0.00
01/11/1972	22.4	0.3	0	0.3	0	76.38	0.00	2.81	13.90	3.83	0.00	12.96	12.86	2203.12	59.29	0.00
02/11/1972	22.2	4.3	0	4.3	0	72.64	0.00	2.84	13.87	3.70	8.80	12.96	13.56	2384.79	0.00	13.56
03/11/1972	22.8	22.1	0	22.1	0	74.74	0.00	2.84	13.84	3.88	18.42	12.96	44.83	7938.84	0.00	44.83
04/11/1972	16.7	0	0	0	0	58.00	0.00	1.82	13.80	2.88	0.00	12.96	57.89	9841.87	0.00	57.89
05/11/1972	18.4	0	0	0	0	57.18	0.00	1.82	13.77	2.88	0.00	12.96	70.85	12545.99	59.29	11.86
06/11/1972	17.8	3.8	0	3.8	0	61.02	0.00	1.94	13.73	2.71	1.97	12.96	25.59	4350.81	0.00	25.59
07/11/1972	16.8	18.8	0	18.8	0	66.81	0.00	2.20	13.70	3.08	15.74	12.96	64.29	9229.71	0.00	64.29
08/11/1972	17	5.3	0	5.3	0	58.83	0.00	1.94	13.66	2.72	2.88	12.96	68.83	11871.59	0.00	68.83
09/11/1972	17.8	0	0	0	0	61.02	0.00	1.94	13.63	2.70	0.00	12.96	82.79	14074.71	0.00	82.79
10/11/1972	15	0	0	0	0	53.34	0.00	1.71	13.59	2.80	0.00	12.96	95.75	16277.83	59.29	36.46
11/11/1972	16.4	0.3	0	0.3	0	57.18	0.00	1.82	13.56	2.84	0.00	12.96	49.42	8490.88	59.29	0.00
12/11/1972	20.9	0	0	0	0	68.70	0.00	2.34	13.53	3.21	0.00	12.96	12.86	2203.12	59.29	0.00
13/11/1972	19.8	0	0	0	0	66.81	0.00	2.20	13.49	3.01	0.00	12.96	12.86	2203.12	59.29	0.00
14/11/1972	21.7	28.7	0	28.7	0	71.72	0.00	2.49	13.46	3.38	23.32	12.96	38.28	6187.21	0.00	38.28
15/11/1972	17.5	0	0	0	0	60.20	0.00	1.94	13.42	2.87	0.00	12.96	49.24	8370.33	0.00	49.24
16/11/1972	17.8	3.8	0	3.8	0	61.02	0.00	1.94	13.39	2.85	1.14	12.96	63.34	10787.77	0.00	63.34
17/11/1972	20.9	1.5	0	1.5	0	66.70	0.00	2.34	13.35	3.17	0.00	12.96	78.30	12876.89	0.00	78.30
18/11/1972	23.1	0	0	0	0	75.59	0.00	2.81	13.32	3.78	0.00	12.96	89.26	15174.81	0.00	89.26
19/11/1972	20.3	0	0	0	0	67.88	0.00	2.34	13.28	3.15	0.00	12.96	102.72	17377.14	59.29	43.92
20/11/1972	20.3	0	0	0	0	67.88	0.00	2.34	13.25	3.15	0.00	12.96	55.88	9500.28	59.29	0.00
21/11/1972	21.4	0	0	0	0	70.89	0.00	2.49	13.22	3.32	0.00	12.96	12.86	2203.12	59.29	0.00
22/11/1972	24.5	0	0	0	0	78.40	0.00	2.89	13.18	3.84	0.00	12.96	12.86	2203.12	59.29	0.00
23/11/1972	24.7	0.8	0	0.8	0	79.95	0.00	2.89	13.15	3.93	0.00	12.96	12.86	2203.12	0.00	12.86
24/11/1972	25.9	1.8	0	1.8	0	82.42	0.00	3.17	13.11	4.14	0.00	12.96	25.92	4468.25	0.00	25.92
25/11/1972	23.9	0	0	0	0	75.93	0.00	2.81	13.08	3.89	0.00	12.96	38.88	6909.37	0.00	38.88
26/11/1972	22.5	7.4	0	7.4	0	73.81	0.00	2.84	13.04	3.48	3.82	12.96	55.79	8478.65	0.00	55.79
27/11/1972	23.1	2.5	0	2.5	0	75.59	0.00	2.81	13.01	3.88	0.00	12.96	68.72	11882.77	0.00	68.72
28/11/1972	20.8	0.5	0	0.5	0	68.25	0.00	2.34	12.97	3.08	0.00	12.96	81.88	13885.80	0.00	81.88
29/11/1972	20.9	0	0	0	0	68.70	0.00	2.34	12.94	3.07	0.00	12.96	94.84	16889.02	0.00	94.84
30/11/1972	19.7	0	0	0	0	66.23	0.00	2.20	12.91	2.88	0.00	12.96	107.80	19282.14	59.29	48.31
31/11/1972	23.1	0	0	0	0	75.59	0.00	2.81	12.87	3.84	0.00	12.96	61.27	10415.27	29.65	31.82
01/12/1972	24.5	0	0	0	0	78.40	0.00	2.89	12.84	3.84	0.00	12.96	49.88	7578.99	29.65	14.93
02/12/1972	23	2	0	2	0	72.64	0.00	2.84	12.80	3.42	0.00	12.96	27.89	4741.51	0.00	27.89
03/12/1972	18.4	0	0	0	0	57.18	0.00	1.82	12.77	2.80	0.00	12.96	40.85	6944.84	0.00	40.85
04/12/1972	14.5	0	0	0	0	51.87	0.00	1.60	12.73	2.11	0.00	12.96	53.81	8147.78	29.65	24.16
05/12/1972	15.3	0														

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate IC 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter 7000 L/min 0.125 m³/s 59.29 mm
Spring, Fall 3500 L/min 0.0625 m³/s 29.65 mm

Groundwater Inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 m³
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
21/08/1972	18.9	0	0	0	0.00	64.04	0.00	2.06	12.15	2.54	0.00	12.96	22.10	3772.49	29.65	0.00
22/08/1972	11.7	0	0	0	0.00	44.29	0.00	1.31	12.12	1.05	0.00	12.96	12.96	2203.12	29.65	0.00
23/08/1972	12.2	19.1	0	19.1	0.00	45.69	0.00	1.40	12.09	1.77	17.33	12.96	30.29	5149.12	0.00	30.29
24/08/1972	17	6.1	0	6.1	0.00	56.83	0.00	1.94	12.08	2.40	3.70	12.96	40.65	7981.26	0.00	40.65
25/08/1972	20.8	5.8	0	5.8	0.00	68.70	0.00	2.34	12.03	2.85	2.75	12.96	62.65	10831.35	0.00	62.65
26/08/1972	19.7	2.5	0	2.5	0.00	82.23	0.00	2.20	12.00	2.58	0.00	12.96	78.61	12854.87	0.00	78.61
27/08/1972	19.1	0	0	0	0.00	98.13	0.00	1.50	11.97	1.88	0.00	12.96	88.57	15057.59	0.00	88.57
28/08/1972	19.6	0	0	0	0.00	116.50	0.00	1.50	11.94	1.88	0.00	12.96	101.63	17290.72	29.65	71.89
29/08/1972	18.9	28.9	0	28.9	0.00	134.04	0.00	2.08	11.91	2.81	24.39	12.96	109.24	18570.67	0.00	109.24
30/08/1972	9.7	0.8	0	0.8	0.00	152.80	0.00	1.15	11.87	1.44	0.00	12.96	122.20	20773.79	0.00	122.20
01/09/1972	9.2	1.8	0	1.8	0.00	171.53	0.00	1.15	11.84	1.43	0.07	12.96	135.22	22869.01	0.00	135.22
02/09/1972	15.3	0	0	0	0.00	190.23	0.00	1.23	11.81	1.50	0.00	12.96	148.18	25191.18	0.00	148.18
03/09/1972	18.1	0	0	0	0.00	208.94	0.00	1.06	11.78	2.49	0.00	12.96	161.14	27584.25	29.65	131.50
04/09/1972	17.8	0	0	0	0.00	227.65	0.00	1.84	11.75	2.33	0.00	12.96	174.46	24557.38	29.65	144.81
05/09/1972	18.4	0	0	0	0.00	246.36	0.00	2.08	11.72	2.47	0.00	12.96	187.77	21720.50	29.65	98.12
06/09/1972	17.3	30.2	0	30.2	0.00	265.06	0.00	1.94	11.69	2.32	27.88	12.96	198.95	23922.58	0.00	198.95
07/09/1972	10	9.5	0	9.5	0.00	283.77	0.00	1.23	11.65	1.81	0.00	12.96	211.92	25825.89	0.00	211.92
08/09/1972	10.8	0	0	0	0.00	302.47	0.00	1.23	11.63	1.50	0.00	12.96	224.88	27828.81	0.00	224.88
09/09/1972	8.4	0	0	0	0.00	321.18	0.00	0.84	11.60	1.10	0.00	12.96	237.83	30231.93	29.65	148.18
10/09/1972	8.1	0	0	0	0.00	339.89	0.00	0.94	11.57	1.15	0.00	12.96	250.78	32735.05	29.65	131.50
11/09/1972	12.8	1	0	1	0.00	358.60	0.00	1.40	11.54	1.00	0.00	12.96	263.74	24558.18	0.00	144.46
12/09/1972	19.6	2.3	0	2.3	0.00	377.30	0.00	1.50	11.50	1.70	0.51	12.96	276.69	26848.05	0.00	187.03
13/09/1972	7	0	0	0	0.00	396.01	0.00	1.00	11.47	1.22	0.00	12.96	289.64	29251.18	0.00	179.89
14/09/1972	12	0	0	0	0.00	414.72	0.00	1.40	11.44	1.68	0.00	12.96	302.59	31854.30	29.65	154.20
15/09/1972	5.6	4.6	0	4.6	0.00	433.43	0.00	0.87	11.41	1.09	3.54	12.96	315.54	29818.82	0.00	179.70
16/09/1972	8.0	5.1	0	5.1	0.00	452.14	0.00	1.07	11.38	1.26	3.81	12.96	328.49	31889.45	0.00	187.47
17/09/1972	5.3	0	0	0	0.00	470.85	0.00	0.87	11.35	1.06	0.00	12.96	341.44	34072.57	0.00	200.43
18/09/1972	0.0	3.9	0	3.9	0.00	489.56	0.00	0.81	11.32	0.75	2.85	12.96	354.39	36255.81	0.00	216.29
19/09/1972	0.8	0	0	0	0.00	508.27	0.00	0.81	11.29	0.75	0.00	12.96	367.34	38439.03	0.00	229.19
20/09/1972	2.8	0	0	0	0.00	526.98	0.00	0.71	11.26	0.88	0.00	12.96	380.29	41188.06	29.65	212.81
21/09/1972	5.9	5.3	0	5.3	0.00	545.69	0.00	0.87	11.23	1.05	4.25	12.96	393.24	43937.10	0.00	229.12
22/09/1972	9.6	13.7	0	13.7	0.00	564.40	0.00	1.15	11.20	1.35	12.35	12.96	406.19	46686.14	0.00	255.03
23/09/1972	11.7	7.4	0	7.4	0.00	583.11	0.00	1.31	11.18	1.53	8.87	12.96	419.14	49435.18	0.00	273.85
24/09/1972	4.2	0.5	0	0.5	0.00	601.82	0.00	0.81	11.15	0.87	0.00	12.96	432.09	46784.10	0.00	280.81
25/09/1972	4.8	0	0	0	0.00	620.53	0.00	0.81	11.10	0.87	0.00	12.96	445.04	50981.22	0.00	299.77
26/09/1972	6.7	0	0	0	0.00	639.24	0.00	0.94	11.07	1.10	0.00	12.96	457.99	53164.35	29.65	283.98
27/09/1972	7.7	0	0	0	0.00	657.95	0.00	1.31	11.04	1.52	0.00	12.96	470.94	55347.47	29.65	298.62
28/09/1972	10.8	7.4	0	7.4	0.00	676.66	0.00	1.23	11.01	1.42	5.98	12.96	483.89	49507.81	0.00	285.34
29/09/1972	7.2	4.1	0	4.1	0.00	695.37	0.00	1.00	10.98	1.17	2.83	12.96	496.84	51688.86	0.00	301.23
30/09/1972	2.8	0	0	0	0.00	714.08	0.00	0.71	10.95	0.83	0.00	12.96	509.79	53869.90	0.00	314.19
01/10/1972	1.4	0	0	0	0.00	732.79	0.00	0.68	10.92	0.78	0.00	12.96	522.74	56051.11	29.65	297.50
02/10/1972	6.8	16.6	0	16.6	0.00	751.50	0.00	0.87	10.89	1.01	14.49	12.96	535.69	58232.22	0.00	324.95
03/10/1972	12.8	13	0	13	0.00	770.21	0.00	1.40	10.86	1.59	0.00	12.96	548.64	60413.34	0.00	337.81
04/10/1972	9.2	0.5	0	0.5	0.00	788.92	0.00	1.15	10.83	1.31	0.00	12.96	561.59	62594.46	0.00	350.86
05/10/1972	6.1	3.3	0	3.3	0.00	807.63	0.00	0.94	10.79	1.05	2.22	12.96	574.54	64775.58	0.00	363.82
06/10/1972	8	0	0	0	0.00	826.34	0.00	0.87	10.76	1.01	0.00	12.96	587.49	66956.70	0.00	376.78
07/10/1972	8.7	0	0	0	0.00	845.05	0.00	1.07	10.73	1.22	0.00	12.96	599.44	69137.82	29.65	362.32
08/10/1972	9.2	12.2	0	12.2	0.00	863.76	0.00	1.15	10.70	1.30	11.80	12.96	611.39	71318.94	0.00	387.18
09/10/1972	7.8	1.8	0	1.8	0.00	882.47	0.00	0.90	10.67	1.13	0.87	12.96	623.34	73500.06	0.00	400.81
10/10/1972	3.4	0	0	0	0.00	901.18	0.00	0.75	10.64	0.87	0.00	12.96	635.29	75681.18	0.00	413.77
11/10/1972	5.6	5.1	0	5.1	0.00	919.89	0.00	0.87	10.61	0.99	4.11	12.96	647.24	77862.30	0.00	430.84
12/10/1972	5.8	1.8	0	1.8	0.00	938.60	0.00	0.87	10.58	0.99	0.81	12.96	659.19	79943.42	0.00	444.81
13/10/1972	5.3	0	0	0	0.00	957.31	0.00	0.87	10.55	0.98	0.00	12.96	671.14	82024.54	0.00	457.77
14/10/1972	5.6	8.6	6.1	13.7	5.10	976.02	5.10	0.87	10.52	0.98	12.72	12.96	683.09	84105.66	0.00	483.25
15/10/1972	-1.1	0	8.4	8.4	8.40	994.73	0.00	0.58	10.49	0.67	0.00	12.96	695.04	86186.78	0.00	496.21
16/10/1972	-2.8	0	0	0	8.40	1013.44	0.00	0.55	10.46	0.64	0.00	12.96	706.99	88267.90	29.65	473.52
17/10/1972	-1.4	0	0	0	8.40	1032.15	0.00	0.58	10.43	0.64	0.00	12.96	718.94	90349.02	29.65	482.94
18/10/1972	-1.4	0	0	0	8.40	1050.86	0.00	0.58	10.40	0.65	0.00	12.96	730.89	92430.14	29.65	446.16
19/10/1972	0.3	0	0	0	8.40	1069.57	0.00	0.81	10.36	0.89	0.00	12.96	742.84	94511.26	29.65	420.46
20/10/1972	2.2	0	5.3	5.3	13.70	1088.28	13.70	0.71	10.33	1.29	12.81	12.96	754.79	96592.38	0.00	455.33
21/10/1972	1.4	0	0	0	0.00	1106.99	0.00	0.68	10.30	0.73	0.00	12.96	766.74	98673.50	0.00	468.29
22/10/1972	-2.5	0	0	0	0.00	1125.70	0.00	0.55	10.27	0.63	0.00	12.96	778.69	100754.62	29.65	451.60
23/10/1972	-3.4	0	0	0	0.00	1144.41	0.00	0.52	10.24	0.59	0.00	12.96	790.64	102835.74	29.65	434.82
24/10/1972	-2.0	0	0	0	0.00	1163.12	0.00	0.55	10.21	0.62	0.00	12.96	802.59	104916.86	29.65	418.23
25/10/1972	1.7	0	0	0	0.00	1181.83	0.00	0.68	10.18	0.72	0.00	12.96	814.54	107000.00	29.65	401.84
26/10/1972	3.8	5.3	0	5.3	0.00	1200.54	0.00	0.78	10.15	0.83	4.47	12.96	826.49	109081.12	0.00	415.97
27/10/1972	3.4	14	0	14	0.00	1219.25	0.00	0.78	10.12	0.83	13.17	12.96	838.44	111162.24	0.00	445.11
28/10/1972	2.5	5.3	0	5.3	0.00	1237.96	0.00	0.71	10.09	0.77	4.53	12.96	850.39	113243.36	0.00	467.89
29/10/1972	3.2	0	0	0	0.00	1256.67	0.00	0.71	10.06	0.74	0.00	12.96	862.34	115324.48	0.00	473.84
30/10/1972	-0.8	0	0	0	0.00	1275.38										

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.25
 Elevation 175.3
 Climate k 6138606
 WMO Identifier
 TC Identifier

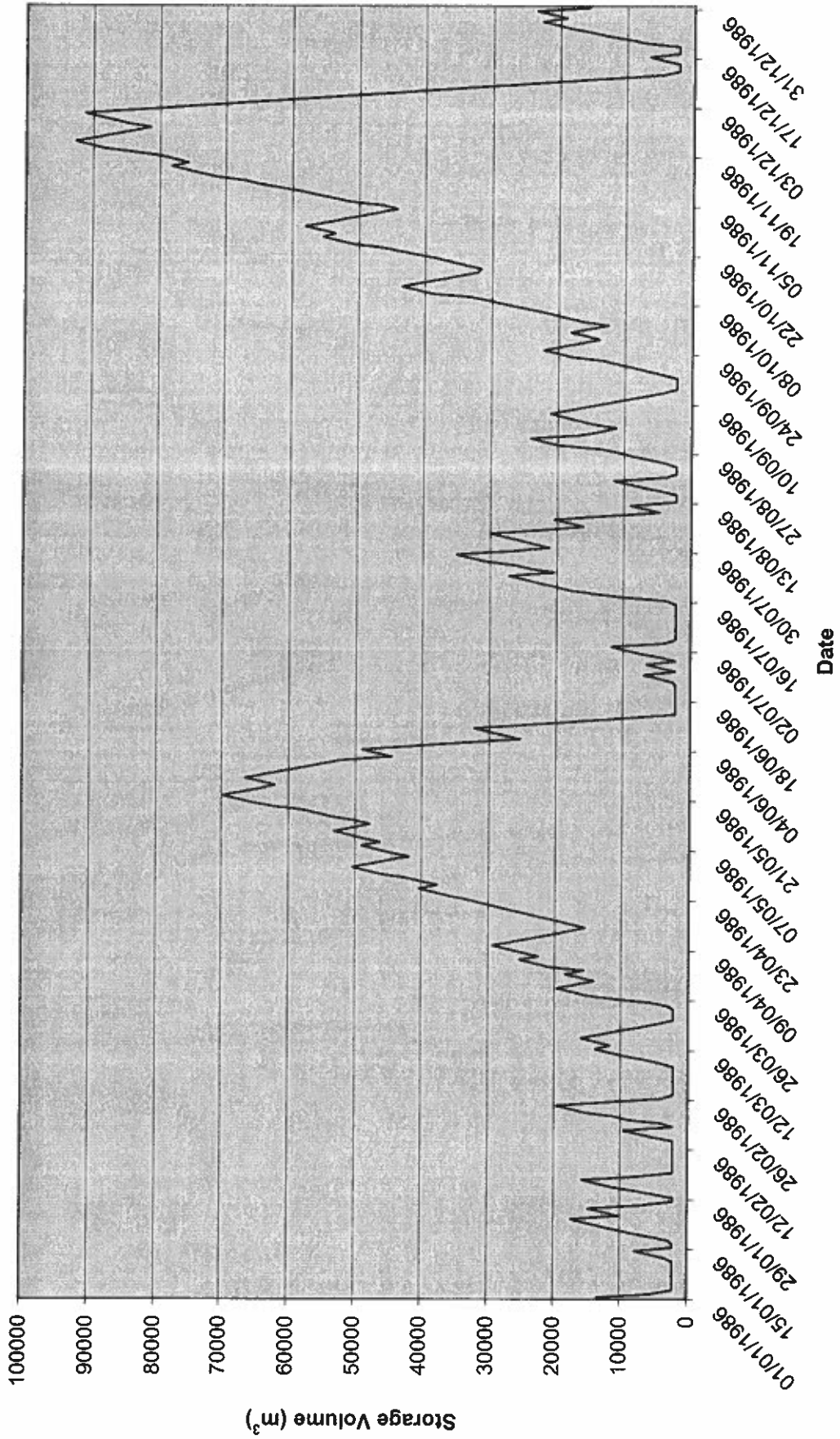
Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 59.29 mm 29.65 mm

Groundwater Inflow 804,140 m³/yr
 2203.12 m³/day
 12.96 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 1037.87 mm
 176436 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
18/12/1972	-2.8	1	0.3	1.3	17.40	0.00	0.00	0.55	9.44	0.68	0.42	12.96	466.98	78693.94	0.00	469.96
19/12/1972	0.9	0.6	0	0.6	17.40	0.00	0.00	0.81	9.41	0.82	5.86	12.96	486.90	83112.91	0.00	488.90
20/12/1972	0	0.3	0	0.3	17.40	0.00	0.00	0.91	9.28	0.82	0.00	12.96	501.86	85315.73	0.00	501.86
21/12/1972	0	4.6	0	4.6	17.40	0.00	0.00	0.81	9.34	0.82	3.98	12.96	518.79	88195.05	0.00	518.79
22/12/1972	-2	0.3	0	0.3	17.40	17.66	17.40	0.71	9.31	0.71	19.99	12.96	549.74	93486.13	0.00	549.74
23/12/1972	2.8	0	0	0	0.00	19.97	0.00	0.71	9.28	0.71	0.00	12.96	581.70	95499.26	0.00	581.70
24/12/1972	3.3	0	0	0	0.00	21.24	0.00	0.78	9.25	0.78	0.00	12.96	574.66	97992.38	59.29	515.37
25/12/1972	2.5	1.5	0	1.5	0.00	19.05	0.00	0.71	9.22	0.70	0.80	12.96	520.12	88950.87	0.00	629.12
26/12/1972	1.2	2	0	2	0.00	16.48	0.00	0.88	9.19	0.96	1.24	12.96	543.43	92382.62	0.00	543.43
27/12/1972	-0.3	0.3	0	0.3	0.00	0.00	0.00	0.58	9.16	0.88	0.00	12.96	550.39	94585.64	0.00	550.39
28/12/1972	0.3	0	0	0	0.00	0.00	0.00	0.81	9.13	0.81	0.00	12.96	569.35	99789.77	59.29	510.05
29/12/1972	-2	0.6	0	0.6	0.00	0.00	0.00	0.58	9.10	0.58	0.00	12.96	573.61	99911.82	0.00	573.61
30/12/1972	2.5	3.8	0	3.8	0.00	19.05	0.00	0.71	9.07	0.99	3.11	12.96	536.08	91843.36	0.00	536.08
31/12/1972	7.8	6.9	0	6.9	0.00	33.59	0.00	1.00	9.07	0.95	5.94	12.96	557.97	94855.72	0.00	557.97

**Storage Volumes - Phase 1A (Worst Case Groundwater Inflow)
1988 - Average Year from Recorded Data**



**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate k: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
59.29 mm 29.65 mm

Groundwater Inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
178438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)	
01/01/1968	-4	0	0	0	0	0	0	0.52	0.07	0.53	0.00	12.96	78.55	13353.99	59.29	19.29	
02/01/1968	-5.5	0	0	0	0	0	0	0.47	0.11	0.47	0.00	12.96	32.22	5477.11	59.29	0.00	
03/01/1968	-2	0	0	0	0	0	0	0.58	0.15	0.58	0.00	12.96	12.96	2203.12	59.29	0.00	
04/01/1968	-3.5	0	0	0	0	0	0	0.62	0.19	0.62	0.00	12.96	12.96	2203.12	59.29	0.00	
05/01/1968	-13.8	0	0	0	0	0	0	0.23	0.23	0.23	0.00	12.96	12.96	2203.12	59.29	0.00	
06/01/1968	-11	0	0	0	0	0	0	0.27	0.27	0.27	0.00	12.96	12.96	2203.12	59.29	0.00	
07/01/1968	-10.8	0	0	0	0	0	0	0.27	0.31	0.29	0.00	12.96	12.96	2203.12	59.29	0.00	
08/01/1968	-7	0	0	0	0	0	0	0.44	0.35	0.46	0.00	12.96	12.96	2203.12	59.29	0.00	
09/01/1968	-7.3	0	0	0	0	0	0	0.41	0.39	0.43	0.00	12.96	12.96	2203.12	59.29	0.00	
10/01/1968	-6.5	0	0	0	0	0	0	0.38	0.43	0.40	0.00	12.96	12.96	2203.12	59.29	0.00	
11/01/1968	-5.9	0	0	0	0	0	0	0.47	0.47	0.49	0.00	12.96	12.96	2203.12	59.29	0.00	
12/01/1968	-2.8	-1.2	0	1.2	0	0	0	0.71	0.51	0.72	0.59	12.96	19.82	3571.84	0.00	19.82	
13/01/1968	-6.6	0	0	0	0	0	0	0.44	0.65	0.47	0.00	12.96	32.79	6576.07	0.00	68.74	
14/01/1968	-12.6	0	0	0	0	0	0	0.25	0.69	0.27	0.00	12.96	45.76	7778.19	0.00	0.00	
15/01/1968	-6	0	0	0	0	0	0	0.47	0.63	0.60	0.00	12.96	12.96	2203.12	59.29	0.00	
16/01/1968	2.3	0	0	0	0	18.50	0.00	0.71	0.67	0.74	0.00	12.96	12.96	2203.12	59.29	0.00	
17/01/1968	3.8	4.8	0	4.8	0.00	22.67	0.00	0.79	0.70	0.79	3.81	12.96	16.77	2850.58	0.00	16.77	
18/01/1968	2.5	3	0	3	0.00	19.05	0.00	0.71	0.74	0.74	2.28	12.96	31.99	5437.29	0.00	31.99	
19/01/1968	3.3	4.8	0	4.8	0.00	21.24	0.00	0.78	0.79	0.80	3.80	12.96	48.74	8286.52	0.00	48.74	
20/01/1968	4	0.8	0	0.8	0.00	23.18	0.00	0.81	0.82	0.85	0.00	12.96	61.70	10489.85	0.00	61.70	
21/01/1968	-0.3	2.2	0	2.2	0.00	0.00	0.00	0.58	0.85	0.63	1.57	12.96	76.24	12880.20	0.00	76.24	
22/01/1968	-3.8	0	0	0	0	0	0	0.52	0.90	0.67	0.00	12.96	89.20	15183.33	0.00	89.20	
23/01/1968	-1.3	0	0	0	0	0	0	0.58	0.84	0.63	0.00	12.96	102.16	17389.45	59.29	42.86	
24/01/1968	-0.3	6.2	0	6.2	0.00	0.00	0.00	0.81	0.89	0.86	4.84	12.96	90.39	16286.73	0.00	90.39	
25/01/1968	-1.5	0	0	0	0	0	0	0.58	0.92	0.64	0.00	12.96	73.32	12453.86	0.00	73.32	
26/01/1968	-5.6	0	12	12	18.00	0.00	0.00	0.47	1.09	0.52	0.00	12.96	88.28	14988.88	59.29	28.98	
27/01/1968	-10	0	0	0	0	18.09	0.00	0.29	1.10	0.33	0.00	12.96	39.84	6790.10	59.29	0.00	
28/01/1968	-7.5	0	0	0	0	18.09	0.00	0.41	1.14	0.47	0.00	12.96	12.96	2203.12	59.29	0.00	
29/01/1968	-3.3	0	0	0	0	18.09	0.00	0.52	1.18	0.59	0.00	12.96	12.96	2203.12	59.29	0.00	
30/01/1968	4.8	0	0	0	0	18.09	28.36	18.09	1.22	0.89	17.11	12.96	30.07	5111.88	0.00	30.07	
31/01/1968	-2.3	-2.7	0	-2.7	0	0	32.47	0.00	1.00	10.29	1.09	3.11	12.96	48.14	7853.05	0.00	48.14
01/02/1968	3.3	7	0.8	7.8	0.80	21.24	0.00	0.78	10.30	0.84	6.96	12.96	68.05	11229.05	0.00	68.05	
02/02/1968	-2.5	0	0	0	0	0	0	0.55	10.34	0.63	0.00	12.96	79.01	13432.21	0.00	79.01	
03/02/1968	-4.8	0	19	19	10.00	0.00	0.00	0.50	10.36	0.57	0.00	12.96	91.87	16435.34	59.29	32.58	
04/02/1968	-5	0	0	0	10.00	0.00	0.00	0.50	10.42	0.57	0.00	12.96	45.94	7758.46	59.29	0.00	
05/02/1968	-12.3	0	1.8	1.8	11.90	0.00	0.00	0.25	10.46	0.30	0.00	12.96	12.96	2203.12	59.29	0.00	
06/02/1968	-15.8	0	19	19	21.50	0.00	0.00	0.23	10.50	0.28	0.00	12.96	12.96	2203.12	59.29	0.00	
07/02/1968	-8	0	3	3	24.00	0.00	0.00	0.28	10.54	0.34	0.00	12.96	12.96	2203.12	59.29	0.00	
08/02/1968	-6.5	0	1.2	1.2	25.80	0.00	0.00	0.38	10.58	0.45	0.00	12.96	12.96	2203.12	59.29	0.00	
09/02/1968	-7	0	7	7	32.80	0.00	0.00	0.44	10.62	0.52	0.00	12.96	12.96	2203.12	59.29	0.00	
10/02/1968	-7.8	0	0	0	32.80	0.00	0.00	0.41	10.66	0.49	0.00	12.96	12.96	2203.12	59.29	0.00	
11/02/1968	-4	0	5.4	5.4	38.20	0.00	0.00	0.52	10.70	0.62	0.00	12.96	12.96	2203.12	59.29	0.00	
12/02/1968	-4.3	0	9.8	9.8	39.00	0.00	0.00	0.60	10.74	0.69	0.00	12.96	12.96	2203.12	59.29	0.00	
13/02/1968	-9	0	0	0	0	39.00	0.00	0.60	10.78	0.60	0.00	12.96	12.96	2203.12	59.29	0.00	
14/02/1968	-2.3	0	0	0	0	39.00	0.00	0.65	10.82	0.66	0.00	12.96	12.96	2203.12	59.29	0.00	
15/02/1968	1.5	1.8	0	1.8	39.00	19.31	19.31	0.66	10.85	0.77	17.13	12.96	30.09	5115.88	0.00	30.09	
16/02/1968	-2.5	0	0	0	0	22.89	0.00	0.55	10.80	0.66	0.00	12.96	43.05	7318.80	0.00	43.05	
17/02/1968	-0.5	0	0	0	22.89	0.00	0.00	0.58	10.84	0.70	0.00	12.96	58.01	9521.93	59.29	0.00	
18/02/1968	-1.3	0	0	0	22.89	0.00	0.00	0.58	10.88	0.70	0.00	12.96	12.96	2203.12	59.29	0.00	
19/02/1968	-11	11	0	11	24.00	0.00	0.00	0.58	11.02	1.00	10.29	12.96	23.49	3953.78	0.00	23.29	
20/02/1968	1.5	1	2	3	24.89	18.31	18.31	0.66	11.06	0.79	18.52	12.96	52.74	8576.92	0.00	52.74	
21/02/1968	-7.5	0	0	0	0	8.36	0.00	0.41	11.10	0.51	0.00	12.96	65.09	11198.15	0.00	65.09	
22/02/1968	-0.5	11.8	0	11.8	8.36	0.00	0.00	0.58	11.14	0.71	11.09	12.96	89.75	15256.83	0.00	89.75	
23/02/1968	0.5	0	0	0	8.36	0.00	0.00	0.81	11.18	0.74	0.00	12.96	102.71	17459.85	0.00	102.71	
24/02/1968	-5	0	1.8	1.8	10.19	0.00	0.00	0.50	11.22	0.62	0.00	12.96	115.87	18903.06	59.29	56.37	
25/02/1968	-7.8	0	0	0	10.19	0.00	0.00	0.41	11.26	0.62	0.00	12.96	69.33	11789.20	59.29	10.04	
26/02/1968	-9	0	0	0	10.19	0.00	0.00	0.50	11.30	0.62	0.00	12.96	73.00	12906.32	59.29	0.00	
27/02/1968	-2.5	0	0	0	10.19	0.00	0.00	0.65	11.34	0.69	0.00	12.96	12.96	2203.12	59.29	0.00	
28/02/1968	-4.3	0	0	0	10.19	0.00	0.00	0.50	11.38	0.63	0.00	12.96	12.96	2203.12	59.29	0.00	
29/02/1968	-0.5	0	2	2	12.19	0.00	0.00	0.58	11.42	0.73	0.00	12.96	12.96	2203.12	29.65	0.00	
01/03/1968	-4.3	0	0	0	12.19	0.00	0.00	0.60	11.46	0.63	0.00	12.96	12.96	2203.12	29.65	0.00	
02/03/1968	-1	0	0	0	12.19	0.00	0.00	0.66	11.50	0.73	0.00	12.96	12.96	2203.12	29.65	0.00	
03/03/1968	-2.3	0	0	0	12.19	0.00	0.00	0.55	11.54	0.70	0.00	12.96	12.96	2203.12	29.65	0.00	
04/03/1968	-1.5	0	0	0	12.19	0.00	0.00	0.58	11.58	0.74	0.00	12.96	12.96	2203.12	29.65	0.00	
05/03/1968	-3.5	0	0	0	12.19	0.00	0.00	0.52	11.62	0.67	0.00	12.96	12.96	2203.12	29.65	0.00	
06/03/1968	-1	0	0	0	12.19	0.00	0.00	0.58	11.66	0.74	0.00	12.96	12.96	2203.12	29.65	0.00	
07/03/1968	2.8	0	0	0	12.19	19.87	12.19	0.71	11.70	0.89	11.29	12.96	24.25	4123.21	0.00	24.25	
08/03/1968	4.3	1.8	0	1.8	0.00	23.89	0.00	0.81	11.74	1.02	0.78	12.96	37.99	6458.11	0.00	37.99	
09/03/1968	3.8	5	0	5	0.00	22.87	0.00	0.78	11.78	0.95	4.04	12.96	54.89	9347.85	0.00	54.89	
10/03/1968	-7.3	0	0	0	0	15.78	0.00	0.66	11.82	0.84	0.00	12.96	67.85	11611.98	0.00	67.85	
11/03/1968	0	0	0	0	0	0	0	0.81	11.86	0.79	0.00	12.96	80.91	13754.90	29.65	51.26	
12/03/1968	1.3	4.8	0	4.8	0.00	15.78	0.00	0.66	11.90	0.85	3.75	12.96	67.87	11555.06	0.00	67.87	
13/03/1968	1	0	0.4	0.4	0.40	0.00	0.00	0.66	11.94	0.85	0.00	12.96	80.63	13756.16	0.00	80.63	
14/03/1968	-2.5	0	0.2														

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate k: 6136806
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
59.29 mm 29.65 mm

Groundwater Inflow 804,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
28/03/1965	12.5	0	0	0	0.00	46.48	0.00	1.40	12.52	1.63	0.00	12.96	98.97	18624.72	29.65	99.32
30/03/1965	6.5	0.6	0	0.6	0.00	30.02	0.00	0.84	12.56	1.25	0.00	12.96	82.26	13987.65	0.00	82.26
31/03/1965	4.8	0	0	0	0.00	25.38	0.00	0.81	12.59	1.10	0.00	12.96	95.24	16190.97	0.00	95.24
01/04/1965	7	0	0	0	0.00	31.39	0.00	1.00	12.63	1.35	0.00	12.96	108.20	18394.09	29.65	78.55
02/04/1965	8.3	0.8	0	0.8	0.00	34.88	0.00	1.07	12.66	1.44	0.00	12.96	91.51	15537.21	0.00	91.51
03/04/1965	10.3	2.0	0	2.0	0.00	40.45	0.00	1.23	12.69	1.64	0.00	12.96	122.83	20881.81	0.00	122.83
04/04/1965	6.3	0.2	0	0.2	0.00	29.47	0.00	0.84	12.73	1.27	0.00	12.96	135.79	23984.84	0.00	135.79
05/04/1965	9.6	0	0	0	0.00	38.25	0.00	1.15	12.76	1.64	0.00	12.96	146.75	25288.00	29.65	119.11
06/04/1965	15	2.4	0	2.4	0.00	53.34	0.00	1.71	12.80	2.26	0.14	12.96	132.21	22475.64	0.00	132.21
07/04/1965	8.8	2.8	0	2.8	0.00	39.37	0.00	1.07	12.83	1.45	1.35	12.96	146.51	24907.45	0.00	146.51
08/04/1965	5	0	0	0	0.00	25.91	0.00	0.87	12.86	1.20	0.00	12.96	158.47	27110.58	0.00	158.47
09/04/1965	5.3	0	0	0	0.00	25.75	0.00	0.87	12.89	1.20	0.00	12.96	172.43	29313.79	29.65	142.79
10/04/1965	4	0	0	0	0.00	22.18	0.00	0.81	12.92	1.12	0.00	12.96	185.78	31478.82	29.65	156.10
11/04/1965	6	0	0	0	0.00	28.65	0.00	0.84	12.97	1.20	0.00	12.96	199.05	33630.95	29.65	169.41
12/04/1965	9.5	0	0	0	0.00	38.25	0.00	1.15	13.00	1.67	0.00	12.96	122.37	26053.07	29.65	92.72
13/04/1965	6.3	0	0	0	0.00	34.99	0.00	1.07	13.03	1.48	0.00	12.96	105.66	17986.19	29.65	76.04
14/04/1965	7	0.6	2.4	3	2.40	31.39	2.40	1.00	13.07	1.39	1.81	12.96	60.60	15492.87	0.00	60.60
15/04/1965	2.3	0	1.4	1.4	1.40	18.85	1.40	0.71	13.10	1.00	0.40	12.96	103.99	17873.89	0.00	103.99
16/04/1965	2.6	0	0	0	0.00	19.05	0.00	0.71	13.14	1.00	0.00	12.96	119.92	19979.72	0.00	119.92
17/04/1965	7.3	2.4	0	2.4	0.00	32.22	0.00	1.00	13.17	1.40	1.00	12.96	130.68	22449.80	0.00	130.68
18/04/1965	2.6	0	1.6	1.6	1.60	19.05	1.60	0.71	13.20	1.01	0.59	12.96	144.43	24553.32	0.00	144.43
19/04/1965	1	0	0	0	0.00	0.00	0.00	0.68	13.24	0.85	0.00	12.96	157.39	26756.44	0.00	157.39
20/04/1965	4	1.2	0	1.2	0.00	23.18	0.00	0.81	13.27	1.16	0.04	12.96	170.39	28960.36	0.00	170.39
21/04/1965	4.3	0	0	0	0.00	23.99	0.00	0.81	13.31	1.18	0.00	12.96	183.35	31199.48	0.00	183.35
22/04/1965	4	0.6	0	0.6	0.00	23.18	0.00	0.81	13.34	1.17	0.00	12.96	196.31	33572.61	0.00	196.31
23/04/1965	10	3.8	0	3.8	0.00	39.62	0.00	1.23	13.37	1.73	2.97	12.96	213.34	35927.05	0.00	213.34
24/04/1965	6	0	0	0	0.00	28.65	0.00	0.84	13.41	1.34	0.90	12.96	224.30	38131.07	0.00	224.30
25/04/1965	6.5	0	0	0	0.00	30.02	0.00	0.84	13.44	1.34	0.00	12.96	237.26	40334.20	29.65	207.61
26/04/1965	8	1.2	0	1.2	0.00	34.14	0.00	1.07	13.48	1.53	0.00	12.96	220.57	37487.32	0.00	220.57
27/04/1965	8.5	3.4	0	3.4	0.00	35.51	0.00	1.07	13.51	1.63	1.87	12.96	225.40	40017.73	0.00	225.40
28/04/1965	8.3	1.2	0	1.2	0.00	34.88	0.00	1.07	13.55	1.54	0.00	12.96	248.29	42230.95	0.00	248.29
29/04/1965	8.5	10.8	0	10.8	0.00	30.02	0.00	0.84	13.58	1.54	1.05	12.96	270.56	44991.01	0.00	270.56
30/04/1965	8.5	0	0	0	0.00	35.51	0.00	1.07	13.61	1.55	0.00	12.96	283.52	48199.13	0.00	283.52
01/05/1965	8.3	0	0	0	0.00	34.98	0.00	1.07	13.65	1.55	0.00	12.96	296.48	50402.26	29.65	266.84
02/05/1965	11	0	0	0	0.00	42.37	0.00	1.31	13.68	1.89	0.00	12.96	279.80	47565.38	29.65	250.15
03/05/1965	8.8	0	0	0	0.00	36.37	0.00	1.07	13.72	1.58	0.00	12.96	269.11	44738.60	29.65	239.46
04/05/1965	11.8	1.2	0	1.2	0.00	44.87	0.00	1.31	13.75	1.89	0.00	12.96	246.42	41881.83	0.00	246.42
05/05/1965	13.3	5.2	0	5.2	0.00	48.95	0.00	1.50	13.78	2.15	3.05	12.96	282.43	44918.84	0.00	282.43
06/05/1965	14.3	0	0	0	0.00	51.42	0.00	1.60	13.82	2.28	0.00	12.96	275.39	46816.87	0.00	275.39
07/05/1965	13.6	0	0	0	0.00	49.23	0.00	1.50	13.85	2.16	0.00	12.96	288.35	49020.08	29.65	258.71
08/05/1965	17	2	0	2	0.00	58.83	0.00	1.84	13.89	2.76	0.00	12.96	271.67	46183.21	0.00	271.67
09/05/1965	15.3	5.2	0	5.2	0.00	54.18	0.00	1.71	13.92	2.45	2.75	12.96	287.37	48853.64	0.00	287.37
10/05/1965	14.5	0	0	0	0.00	51.97	0.00	1.60	13.95	2.31	0.00	12.96	300.33	51058.87	0.00	300.33
11/05/1965	17.2	0	0	0	0.00	45.11	0.00	1.40	13.99	2.05	0.00	12.96	313.29	53292.79	29.65	283.65
12/05/1965	12.3	0	0	0	0.00	45.83	0.00	1.40	14.02	2.05	0.00	12.96	298.61	50422.91	29.65	268.96
13/05/1965	12	3.2	0	3.2	0.00	45.11	0.00	1.40	14.05	2.06	1.14	12.96	281.06	47779.85	0.00	281.06
14/05/1965	8.6	0	0	0	0.00	38.25	0.00	1.15	14.09	1.71	0.00	12.96	294.92	46882.88	0.00	294.92
15/05/1965	15.8	6.6	0	6.6	0.00	55.53	0.00	1.71	14.12	2.48	7.12	12.96	314.09	53395.82	0.00	314.09
16/05/1965	18.3	3.2	0	3.2	0.00	58.81	0.00	1.82	14.16	2.85	0.55	12.96	327.89	55982.82	0.00	327.89
17/05/1965	17.5	0	0	0	0.00	54.18	0.00	1.40	14.19	2.68	0.00	12.96	340.58	57265.75	0.00	340.58
18/05/1965	12.5	16.8	0	16.8	0.00	49.48	0.00	1.40	14.23	2.98	13.52	12.96	367.04	62397.07	0.00	367.04
19/05/1965	14.5	7.4	0	7.4	0.00	61.87	0.00	1.80	14.26	2.39	5.04	12.96	385.04	65456.79	0.00	385.04
20/05/1965	15.8	0	0	0	0.00	65.53	0.00	1.71	14.29	2.61	0.00	12.96	398.00	67859.82	0.00	398.00
21/05/1965	14.8	0	0	0	0.00	52.79	0.00	1.60	14.33	2.37	0.00	12.96	410.95	69853.04	29.65	381.31
22/05/1965	17.5	0	0	0	0.00	60.20	0.00	1.84	14.36	2.85	0.00	12.96	394.27	67028.18	29.65	364.62
23/05/1965	18.3	0	0	0	0.00	62.39	0.00	2.06	14.40	3.04	0.00	12.96	377.59	64189.29	29.65	347.94
24/05/1965	15.3	8.6	0	8.6	0.00	54.18	0.00	1.71	14.43	2.54	4.08	12.96	364.89	62642.32	0.00	364.89
25/05/1965	8.8	0.4	0	0.4	0.00	36.37	0.00	1.07	14.46	1.84	0.00	12.96	377.91	64245.44	0.00	377.91
26/05/1965	9.8	0	0	0	0.00	39.08	0.00	1.15	14.50	1.75	0.00	12.96	390.87	66448.57	29.65	361.23
27/05/1965	16.5	0	0	0	0.00	57.45	0.00	1.82	14.53	2.72	0.00	12.96	374.19	63811.69	29.65	344.54
28/05/1965	16.9	0	0	0	0.00	55.53	0.00	1.71	14.57	2.56	0.00	12.96	357.50	60774.81	29.65	327.85
29/05/1965	17	0	0	0	0.00	55.53	0.00	1.84	14.60	2.81	0.00	12.96	349.81	57927.94	29.65	311.16
30/05/1965	20	0	0	0	0.00	67.09	0.00	2.24	14.63	3.48	0.00	12.96	324.12	55331.05	29.65	294.48
31/05/1965	18.3	0	0	0	0.00	62.39	0.00	2.08	14.67	3.10	0.00	12.96	307.44	52284.18	29.65	278.14
01/06/1965	19	4.2	0	4.2	0.00	64.31	0.00	2.20	14.70	3.29	0.81	12.96	292.01	44541.27	0.00	292.01
02/06/1965	12	0	0	0	0.00	45.11	0.00	1.40	14.74	2.16	0.00	12.96	274.87	46744.39	0.00	274.87
03/06/1965	14.3	0	0	0	0.00	51.42	0.00	1.60	14.77	2.45	0.00	12.96	287.93	48847.51	29.65	258.28
04/06/1965	13	0	0	0	0.00	47.85	0.00	1.60	14.81	2.31	0.00	12.96	241.89	41870.84	29.65	182.30
05/06/1965	19.3	0	0	0	0.00	65.14	0.00	2.20	14.84	3.32	0.00	12.96	195.29	33169.78	29.65	135.66
06/06/1965	19.1	1.8	0	1.8	0.00	66.51	0.00	2.20	14.87	3.32	0.00	12.96	148.87	20188.00	0.00	148.87
07/06/1965																

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.25
 Elevation 175.3
 Climate K 8136606
 WMO Identifier
 TC Identifier

Max. Allowable Release: Summer, Winter 7000 L/min 3500 L/min
 0.125 m³/a 0.0625 m³/a
 59.29 mm 29.65 mm

Groundwater Inflow 804,140 m³/yr
 2203.12 m³/day
 12.96 mm

Phase 1A Quarry Area 17 ha
 Max. Storage Volume 1037.67 mm
 178438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
25/06/1965	23.8	1.8	0	1.8	0.00	77.48	0.00	2.81	15.18	4.28	0.00	12.96	12.96	2203.12	0.00	12.96
26/06/1965	17.3	0	0	0	0.00	61.02	0.00	1.94	15.14	3.01	0.00	12.96	25.92	4406.25	0.00	25.92
27/06/1965	17.3	0	0	0	0.00	59.95	0.00	1.94	15.11	3.00	0.00	12.96	38.88	8509.37	59.29	0.00
28/06/1965	18.6	1.1	0	1.1	0.00	57.45	0.00	1.82	15.07	2.82	0.00	12.96	51.84	12533.12	0.00	12.96
29/06/1965	23.8	0	0	0	0.00	50.95	0.00	1.50	15.04	2.34	0.00	12.96	64.80	20068.25	0.00	25.92
30/06/1965	14	9.8	0	9.8	0.00	50.90	0.00	1.50	15.01	2.49	4.31	12.96	77.76	32422.25	0.00	43.19
01/07/1965	15.6	0	0	0	0.00	55.53	0.00	1.71	14.97	2.63	0.00	12.96	90.72	65453.88	0.00	56.15
02/07/1965	18.3	0	0	0	0.00	65.14	0.00	2.20	14.94	3.24	0.00	12.96	103.68	111749.60	59.29	9.81
03/07/1965	19.5	0	0	0	0.00	65.58	0.00	2.20	14.90	3.33	0.00	12.96	116.64	13871.62	59.29	0.00
04/07/1965	21.3	0	0	0	0.00	70.82	0.00	2.49	14.87	3.74	0.00	12.96	129.60	2203.12	59.29	0.00
05/07/1965	24.8	0	0	0	0.00	69.22	0.00	2.99	14.83	4.43	0.00	12.96	142.56	2203.12	59.29	0.00
06/07/1965	23.8	0	0	0	0.00	77.48	0.00	2.81	14.80	4.17	0.00	12.96	155.52	2203.12	59.29	0.00
07/07/1965	23.8	0	0	0	0.00	82.97	0.00	3.17	14.78	4.66	0.00	12.96	168.48	2203.12	59.29	0.00
08/07/1965	28.3	0	0	0	0.00	84.34	0.00	3.38	14.73	4.83	0.00	12.96	181.44	2203.12	59.29	0.00
09/07/1965	25.5	0	0	0	0.00	82.14	0.00	3.17	14.70	4.64	0.00	12.96	194.40	2203.12	59.29	0.00
10/07/1965	23.9	0	0	0	0.00	82.14	0.00	3.17	14.68	4.63	0.00	12.96	207.36	2203.12	59.29	0.00
11/07/1965	23	0	0	0	0.00	73.29	0.00	2.81	14.63	4.14	0.00	12.96	220.32	2203.12	59.29	0.00
12/07/1965	22.3	0	0	0	0.00	73.37	0.00	2.84	14.58	3.88	0.00	12.96	233.28	2203.12	59.29	0.00
13/07/1965	21.3	0	0	0	0.00	70.92	0.00	2.49	14.56	3.88	0.00	12.96	246.24	2203.12	59.29	0.00
14/07/1965	20	0.2	0	0.2	0.00	63.52	0.00	2.38	14.52	4.88	0.00	12.96	259.20	2203.12	59.29	0.00
15/07/1965	20.8	12.4	0	12.4	0.00	69.25	0.00	2.49	14.49	3.43	8.97	12.96	272.16	3727.28	0.00	21.93
16/07/1965	24.8	27.2	0	27.2	0.00	89.22	0.00	3.38	14.45	4.81	22.89	12.96	285.12	6630.88	0.00	67.77
17/07/1965	23.3	20	0	20	0.00	78.11	0.00	2.81	14.42	4.07	19.92	12.96	298.08	14731.65	0.00	85.68
18/07/1965	23.3	11.4	0	11.4	0.00	78.11	0.00	2.81	14.39	4.08	7.34	12.96	311.04	18182.07	0.00	108.95
19/07/1965	23.8	2.2	0	2.2	0.00	77.48	0.00	2.81	14.35	4.05	0.00	12.96	324.00	20395.19	0.00	119.81
20/07/1965	21.8	4.8	0	4.8	0.00	71.69	0.00	2.49	14.32	3.80	1.20	12.96	336.96	22792.84	0.00	134.08
21/07/1965	22.5	0	0	0	0.00	73.01	0.00	2.84	14.28	3.81	0.00	12.96	350.00	24985.96	0.00	147.04
22/07/1965	22.8	0	0	0	0.00	74.74	0.00	2.84	14.25	3.79	0.00	12.96	363.04	27199.09	59.29	160.70
23/07/1965	20.8	8.2	0	8.2	0.00	69.25	0.00	2.34	14.21	3.37	5.83	12.96	376.08	30513.45	0.00	174.49
24/07/1965	20.3	12.9	0	12.9	0.00	67.88	0.00	2.34	14.18	3.37	8.23	12.96	389.12	34085.96	0.00	188.28
25/07/1965	21.8	2.2	0	2.2	0.00	71.69	0.00	2.49	14.15	3.65	0.00	12.96	402.16	37829.37	0.00	202.14
26/07/1965	20.8	15.8	0	15.8	0.00	69.25	0.00	2.34	14.11	3.34	12.28	12.96	415.20	41749.60	0.00	216.00
27/07/1965	21.8	0	0	0	0.00	71.69	0.00	2.49	14.08	3.64	0.00	12.96	428.24	45827.03	0.00	229.86
28/07/1965	22.8	0	0	0	0.00	74.74	0.00	2.84	14.04	3.74	0.00	12.96	441.28	50582.15	59.29	243.72
29/07/1965	26	0	0	0	0.00	83.82	0.00	3.38	14.01	4.69	0.00	12.96	454.32	55553.77	59.29	257.58
30/07/1965	26	18	0	18	0.00	83.82	0.00	3.38	13.97	4.68	11.32	12.96	467.36	60645.43	0.00	271.44
31/07/1965	22	0	0	0	0.00	72.64	0.00	2.84	13.94	3.72	0.00	12.96	480.40	65856.11	0.00	285.30
01/08/1965	22.5	1.4	0	1.4	0.00	73.91	0.00	2.84	13.90	3.70	0.00	12.96	493.44	71187.23	0.00	299.16
02/08/1965	23.8	0	0	0	0.00	69.00	0.00	2.78	13.87	3.59	0.00	12.96	506.48	76738.35	0.00	313.02
03/08/1965	27.6	0	0	0	0.00	68.45	0.00	3.57	13.84	4.68	0.00	12.96	519.52	82503.48	59.29	326.88
04/08/1965	28.3	0	0	0	0.00	69.82	0.00	3.78	13.80	5.18	0.00	12.96	532.56	88484.60	59.29	340.74
05/08/1965	27.8	15.8	0	15.8	0.00	67.87	0.00	2.87	13.77	4.81	10.73	12.96	545.60	94580.43	0.00	354.60
06/08/1965	23.4	0	0	0	0.00	79.66	0.00	3.38	13.73	4.52	0.00	12.96	558.64	100781.65	0.00	368.46
07/08/1965	21	0	0	0	0.00	69.80	0.00	2.49	13.70	3.45	0.00	12.96	571.68	107082.87	59.29	382.32
08/08/1965	21.6	0	0	0	0.00	71.17	0.00	2.49	13.66	3.44	0.00	12.96	584.72	113484.09	59.29	396.18
09/08/1965	28.6	1.2	0	1.2	0.00	64.89	0.00	2.38	13.63	4.58	0.00	12.96	597.76	119985.31	0.00	410.04
10/08/1965	28.6	0	0	0	0.00	64.89	0.00	2.38	13.59	4.64	0.00	12.96	610.80	126586.53	0.00	423.90
11/08/1965	24.5	0	0	0	0.00	78.46	0.00	3.38	13.56	4.05	0.00	12.96	623.84	133287.75	59.29	437.76
12/08/1965	28.3	0	0	0	0.00	83.71	0.00	3.38	13.52	4.52	0.00	12.96	636.88	140088.97	59.29	451.62
13/08/1965	27.8	0	0	0	0.00	88.45	0.00	3.57	13.49	4.78	0.00	12.96	649.92	146890.19	59.29	465.48
14/08/1965	28.3	2.8	0	2.8	0.00	88.82	0.00	3.78	13.46	5.03	0.00	12.96	662.96	153691.41	59.29	479.34
15/08/1965	23.6	0	0	0	0.00	82.14	0.00	3.17	13.42	4.24	0.00	12.96	676.00	160492.63	0.00	493.20
16/08/1965	22	6.4	0	6.4	0.00	72.54	0.00	2.84	13.39	3.67	2.83	12.96	689.04	167293.85	0.00	507.06
17/08/1965	28.8	0	0	0	0.00	85.71	0.00	3.38	13.35	4.46	0.00	12.96	702.08	174095.07	0.00	520.92
18/08/1965	22	0	0	0	0.00	72.54	0.00	2.84	13.32	3.55	0.00	12.96	715.12	180896.29	59.29	534.78
19/08/1965	17.6	0	0	0	0.00	69.20	0.00	1.84	13.28	2.84	0.00	12.96	728.16	187697.51	59.29	548.64
20/08/1965	19.3	0	0	0	0.00	65.14	0.00	2.20	13.25	2.87	0.00	12.96	741.20	194498.73	59.29	562.50
21/08/1965	18.6	0	0	0	0.00	62.84	0.00	2.00	13.22	2.78	0.00	12.96	754.24	201299.95	59.29	576.36
22/08/1965	17.3	0	0	0	0.00	59.85	0.00	1.94	13.18	2.62	0.00	12.96	767.28	208101.17	59.29	590.22
23/08/1965	18.6	12.9	0	12.9	0.00	62.84	0.00	2.05	13.15	2.77	8.83	12.96	780.32	214902.39	0.00	604.08
24/08/1965	20.9	4.2	0	4.2	0.00	66.43	0.00	2.34	13.11	3.11	1.89	12.96	793.36	221703.61	0.00	617.94
25/08/1965	20.3	4.8	0	4.8	0.00	67.88	0.00	2.34	13.08	3.11	1.89	12.96	806.40	228504.83	0.00	631.80
26/08/1965	18.6	0	0	0	0.00	62.84	0.00	2.06	13.04	2.76	0.00	12.96	819.44	235306.05	0.00	645.66
27/08/1965	20	4.4	0	4.4	0.00	67.08	0.00	2.34	13.01	3.08	1.31	12.96	832.48	242107.27	0.00	659.52
28/08/1965	19.3	28.8	0	28.8	0.00	65.14	0.00	2.20	12.97	2.90	23.90	12.96	845.52	248908.49	0.00	673.38
29/08/1965	17.3	0.3	0	0.3	0.00	59.85	0.00	1.94	12.94	2.87	0.00	12.96	858.56	255709.71	0.00	687.24
30/08/1965	18.6	0	0	0	0.00	57.45	0.00	1.82	12.91	2.41	0.00	12.96	871.60	262510.93	59.29	701.10
31/08/1965	17.5	0	0	0	0.00	60.20	0.00	1.84	12.87	2.64	0.00	12.96	884.64	269312.15	29.65	714.96
01/09/1965	21.6	0	0	0	0.00	71.17	0.00	2.49	12.84	3.23	0.00	12.96	897.68	276113.37	29.65	728.82
02/09/1965	22.8	7.8	0	7.8	0.00	74.74	0.00	2.84	12.80	3.41	4.19	12.96				

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate k 6130606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter 7000 L/min
Spring, Fall 3500 L/min
0.125 m³/s 0.0625 m³/s
59.29 mm 29.65 mm

Groundwater Inflow 604,140 m³/yr
2203.12 m³/day
12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.87 mm
176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
21/01/1966	14.6	0.8	0	0.8	0.00	52.79	0.00	1.60	12.15	2.01	0.00	12.96	77.76	13218.74	0.00	77.76
22/01/1966	16	15.4	0	15.4	0.00	56.08	0.00	1.82	12.12	2.27	14.13	12.96	104.85	17623.84	0.00	104.85
23/01/1966	19.6	0	0	0	0.00	65.68	0.00	2.20	12.09	2.70	0.00	12.96	117.81	20020.87	0.00	117.81
24/01/1966	13	0	0	0	0.00	47.85	0.00	1.50	12.08	1.88	0.00	12.96	130.77	22230.09	29.65	160.12
25/01/1966	14	0	0	0	0.00	50.69	0.00	1.60	12.02	2.00	0.00	12.96	114.09	19393.21	29.65	84.49
26/01/1966	14	0	0	0	0.00	50.80	0.00	1.60	12.00	1.99	0.00	12.96	97.39	16556.34	29.65	67.74
27/01/1966	17.3	0.6	0	0.6	0.00	59.55	0.00	1.94	11.97	2.38	0.00	12.96	80.70	13719.46	0.00	80.70
28/01/1966	12.0	0	0	0	0.00	47.30	0.00	1.40	11.84	1.74	0.00	12.96	63.86	15822.68	0.00	63.86
29/01/1966	11	0	0	0	0.00	42.37	0.00	1.31	11.81	1.64	0.00	12.96	106.82	18125.71	29.65	76.97
30/01/1966	15.5	0	0	0	0.00	54.71	0.00	1.71	11.87	2.09	0.00	12.96	89.93	15788.63	29.65	60.29
31/01/1966	22.3	1.8	0	1.8	0.00	73.37	0.00	2.54	11.84	3.18	0.00	12.96	73.25	12451.65	0.00	73.25
01/02/1966	19	11.2	0	11.2	0.00	68.09	0.00	1.82	11.81	2.21	8.99	12.96	65.18	16182.68	0.00	65.19
02/02/1966	12	0	0	0	0.00	45.11	0.00	1.40	11.78	1.73	0.00	12.96	106.16	18385.00	0.00	106.16
03/02/1966	10.8	1.4	0	1.4	0.00	41.82	0.00	1.23	11.75	1.61	0.00	12.96	121.11	20589.12	0.00	121.11
04/02/1966	8.3	0.2	0	0.2	0.00	34.99	0.00	1.07	11.72	1.53	0.00	12.96	134.07	22792.25	0.00	134.07
05/02/1966	7.3	4.8	0	4.8	0.00	32.22	0.00	1.00	11.69	1.24	3.58	12.96	150.99	23599.83	0.00	150.99
06/02/1966	9.3	3	0	3	0.00	37.70	0.00	1.18	11.66	1.41	1.59	12.96	165.13	24672.95	0.00	165.13
07/02/1966	8.3	2	0	2	0.00	29.47	0.00	0.84	11.63	1.16	0.84	12.96	184.84	26419.81	0.00	178.84
08/02/1966	8.5	4.8	0	4.8	0.00	35.51	0.00	1.07	11.60	1.32	3.48	12.96	195.38	28214.36	0.00	195.38
09/02/1966	9.3	22.6	0	22.6	0.00	37.70	0.00	1.15	11.57	1.40	21.20	12.96	226.64	30621.98	0.00	226.64
10/02/1966	7.5	0.4	0	0.4	0.00	32.77	0.00	1.00	11.54	1.23	0.00	12.96	242.50	41224.60	0.00	242.50
11/02/1966	3.6	0	0	0	0.00	21.29	0.00	0.78	11.50	0.84	0.00	12.96	255.48	43427.62	29.65	225.81
12/02/1966	3.3	0	0	0	0.00	21.24	0.00	0.78	11.47	0.84	0.00	12.96	268.77	40590.75	29.65	209.12
13/02/1966	4	0	0	0	0.00	34.14	0.00	1.07	11.44	1.30	0.00	12.96	272.06	37753.87	29.65	192.43
14/02/1966	14.8	0	0	0	0.00	52.79	0.00	1.60	11.41	1.89	0.00	12.96	205.39	24616.89	29.65	175.75
15/02/1966	18.6	0.2	0	0.2	0.00	56.28	0.00	1.82	11.38	2.13	0.00	12.96	185.71	23280.12	29.65	156.06
16/02/1966	16	15.8	0	15.8	0.00	59.09	0.00	1.82	11.35	2.13	13.67	12.96	185.89	21567.78	0.00	185.89
17/02/1966	12.3	2	0	2	0.00	45.93	0.00	1.40	11.32	1.66	0.34	12.96	199.00	23820.20	0.00	199.00
18/02/1966	6.3	1.2	0	1.2	0.00	29.47	0.00	0.84	11.29	1.13	0.07	12.96	212.63	20645.02	0.00	212.63
19/02/1966	4.3	0.8	0	0.8	0.00	23.89	0.00	0.81	11.26	0.99	0.00	12.96	224.99	24948.15	0.00	224.99
20/02/1966	7.8	4.8	0	4.8	0.00	33.59	0.00	1.00	11.23	1.19	3.81	12.96	241.56	41064.47	0.00	241.56
21/02/1966	6	5	0	5	0.00	28.55	0.00	0.94	11.20	1.12	3.88	12.96	258.40	43927.95	0.00	258.40
22/02/1966	7	2	0	2	0.00	31.39	0.00	1.00	11.16	1.19	0.81	12.96	272.17	46286.81	0.00	272.17
23/02/1966	6.3	16.4	0	16.4	0.00	29.47	0.00	0.84	11.13	1.11	15.29	12.96	300.42	51070.94	0.00	300.42
24/02/1966	5.5	0.2	0	0.2	0.00	27.28	0.00	0.87	11.10	1.04	0.00	12.96	313.38	53274.67	0.00	313.38
25/02/1966	5	0	0	0	0.00	25.81	0.00	0.87	11.07	1.03	0.00	12.96	328.24	55477.19	29.65	298.59
26/02/1966	7.3	7.2	0	7.2	0.00	32.22	0.00	1.00	11.04	1.16	5.02	12.96	318.87	53994.86	0.00	318.87
27/02/1966	8.3	0	0	0	0.00	34.98	0.00	1.07	11.01	1.25	0.00	12.96	328.83	55867.82	0.00	328.83
28/02/1966	3.3	0	0	0	0.00	21.24	0.00	0.78	10.98	0.80	0.00	12.96	341.69	68070.74	29.65	311.95
29/02/1966	2	0	0	0	0.00	17.88	0.00	0.71	10.95	0.84	0.00	12.96	324.81	65233.87	29.65	295.20
30/02/1966	2.8	0	0	0	0.00	19.95	0.00	0.71	10.92	0.83	0.00	12.96	308.22	62388.99	29.65	278.57
01/03/1966	6.5	0	0	0	0.00	27.28	0.00	0.87	10.89	1.02	0.00	12.96	291.53	49590.11	29.65	261.88
02/03/1966	4.5	0	0	0	0.00	24.54	0.00	0.81	10.86	0.95	0.00	12.96	274.84	46773.24	29.65	245.20
03/03/1966	6	2.8	0	2.8	0.00	28.65	0.00	0.94	10.83	1.06	1.72	12.96	259.87	44178.70	0.00	259.87
04/03/1966	10.5	0.2	0	0.2	0.00	41.00	0.00	1.23	10.79	1.39	0.00	12.96	272.83	46381.83	0.00	272.83
05/03/1966	11.3	17.9	0	17.9	0.00	43.18	0.00	1.31	10.76	1.48	16.12	12.96	301.81	51325.50	0.00	301.81
06/03/1966	7	3.4	0	3.4	0.00	31.39	0.00	1.00	10.73	1.14	2.28	12.96	317.13	53812.18	0.00	317.13
07/03/1966	4.8	2.8	0	2.8	0.00	25.38	0.00	0.80	10.70	0.83	1.87	12.96	331.99	56432.75	0.00	331.99
08/03/1966	5.5	2.2	0	2.2	0.00	22.28	0.00	0.87	10.67	0.96	1.71	12.96	346.12	58874.74	29.65	316.47
09/03/1966	9.3	5	0	5	0.00	37.70	0.00	1.15	10.64	1.29	3.71	12.96	362.79	61874.82	0.00	362.79
10/03/1966	10.5	7.8	0	7.8	0.00	41.00	0.00	1.23	10.61	1.37	6.23	12.96	381.86	64937.31	0.00	381.86
11/03/1966	4.5	0.4	0	0.4	0.00	24.54	0.00	0.81	10.58	0.82	0.00	12.96	394.84	67140.43	0.00	394.84
12/03/1966	4.8	12.4	0	12.4	0.00	25.38	0.00	0.81	10.55	0.82	11.48	12.96	419.38	71295.29	0.00	419.38
13/03/1966	5	2.8	0	2.8	0.00	25.81	0.00	0.87	10.52	0.88	1.82	12.96	434.18	73807.42	0.00	434.18
14/03/1966	8.5	0	0	0	0.00	35.51	0.00	1.07	10.49	1.19	0.00	12.96	447.12	76010.55	0.00	447.12
15/03/1966	6.3	0	0	0	0.00	29.47	0.00	0.84	10.46	1.04	0.00	12.96	460.08	78213.67	29.65	430.43
16/03/1966	12	2.8	0	2.8	0.00	45.11	0.00	1.40	10.42	1.53	1.27	12.96	444.67	75563.06	0.00	444.67
17/03/1966	5.5	0.8	0	0.8	0.00	27.28	0.00	0.87	10.39	0.87	0.00	12.96	457.82	77796.21	0.00	457.82
18/03/1966	3	0	0	0	0.00	20.42	0.00	0.78	10.36	0.85	0.00	12.96	470.58	79999.33	0.00	470.58
19/03/1966	3.8	12.4	0	12.4	0.00	22.82	0.00	0.78	10.33	0.84	11.58	12.96	495.10	84187.22	0.00	495.10
20/03/1966	6.2	11.6	0	11.6	0.00	29.47	0.00	0.84	10.30	1.03	10.67	12.96	518.63	88197.77	0.00	518.63
21/03/1966	4	0	0	0	0.00	23.18	0.00	0.81	10.27	0.80	0.00	12.96	531.99	90370.90	0.00	531.99
22/03/1966	2	0	0	0	0.00	17.88	0.00	0.71	10.24	0.78	0.00	12.96	544.55	92574.02	29.65	514.81
23/03/1966	1.5	0	0	0	0.00	16.31	0.00	0.66	10.21	0.73	0.00	12.96	527.87	90737.14	29.65	498.22
24/03/1966	2.5	0	0	0	0.00	19.05	0.00	0.71	10.18	0.78	0.00	12.96	511.18	89900.27	29.65	481.53
25/03/1966	5.3	0	0	0	0.00	28.73	0.00	0.87	10.15	0.95	0.00	12.96	494.49	84063.39	29.65	464.84
26/03/1966	12	2.4	0	2.4	0.00	45.11	0.00	1.40	10.12	1.48	0.92	12.96	478.72	81262.49	0.00	478.72
27/03/1966	10.8	7.7	0	7.7	0.00	41.82	0.00	1.23	10.09	1.39	5.73	12.96	497.38	84554.74	0.00	497.38
28/03/1966	3	1	0	1	0.00	20.42	0.00	0.78	10.06	0.82	0.18	12.96	510.52	86759.08	0.00	510.52
29/03/1966	3.5	0	0	0	0.00	21.78	0.00	0.78	10.02	0.82	0.00	12.96	523.48	88991.18	0.00	523.48

**Running Daily Water Balance, Reeb Quarry - Phase 1A with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
 Province ONTARIO
 Latitude 42.88
 Longitude -79.25
 Elevation 175.3
 Climate k 6136606
 WMO Identifier
 TC Identifier

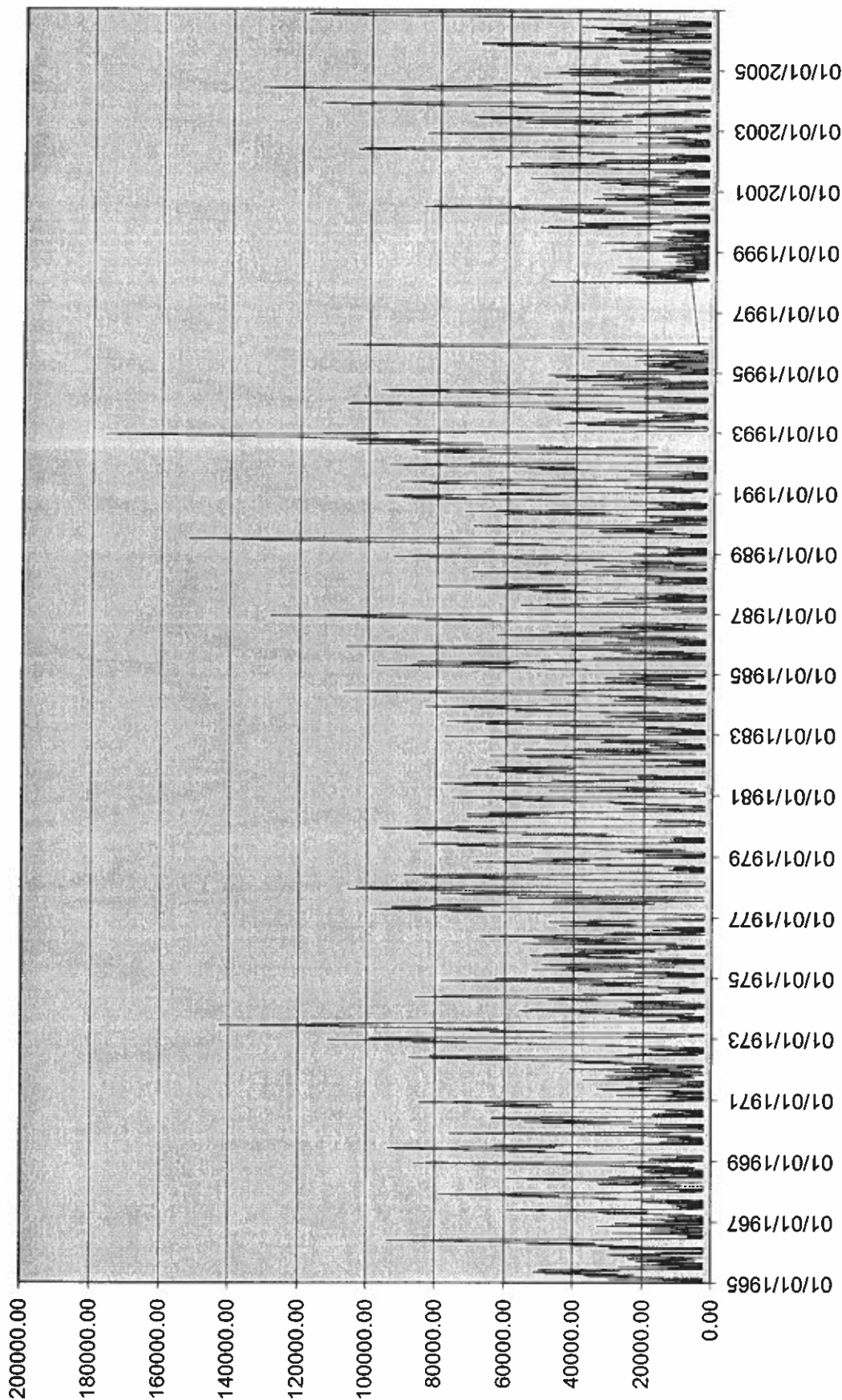
Max. Allowable Release: Summer, Winter 7000 L/min
 Spring, Fall 3500 L/min
 0.125 m³/s
 59.29 mm
 0.0625 m³/s
 29.65 mm

Groundwater Inflow 804,140 m³/yr
 2203.12 m³/day
 12.96 mm

Phase 1A Quarry Area 17 ha
Max. Storage Volume 1037.07 mm
 176438 m³

Date/Time	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
18/12/1965	-4.5	0	8.2	8.2	30.40	0.00	0.00	0.50	9.44	0.52	0.00	12.96	12.96	2203.12	59.29	0.00
19/12/1965	0.8	0	0	0	30.40	0.00	0.00	0.61	9.41	0.82	0.00	12.96	12.88	2203.12	59.29	0.00
20/12/1965	8.5	2	0	2	30.40	30.02	30.02	0.94	9.38	0.93	31.09	12.96	44.05	7488.23	0.00	44.05
21/12/1965	2.5	0.4	0	0.4	0.38	19.05	0.38	0.71	9.34	0.71	0.08	12.96	57.07	8792.26	0.00	57.07
22/12/1965	1	7.2	0	7.2	0.00	0.00	0.00	0.55	9.31	0.67	6.53	12.96	75.57	13018.31	0.00	75.57
23/12/1965	3.3	0.4	0	0.4	0.00	21.24	0.00	0.78	9.28	0.75	0.00	12.96	89.53	15218.44	0.00	89.53
24/12/1965	2.8	5.8	0	5.8	0.00	19.87	0.00	0.71	9.25	0.71	4.89	12.96	107.38	18254.67	0.00	107.38
25/12/1965	-0.3	0	0	0	0.00	0.00	0.00	0.58	9.22	0.89	0.00	12.96	120.34	20457.79	0.00	120.34
26/12/1965	-3	0	1	1	1.00	0.00	0.00	0.55	9.19	0.95	0.00	12.96	133.30	22880.81	59.29	74.01
27/12/1965	2.5	24.4	0.4	24.8	1.40	19.05	1.40	0.71	9.16	0.79	28.19	12.96	112.07	18051.21	0.00	112.07
28/12/1965	-1.3	0	8	8	0.00	0.00	0.00	0.58	9.13	0.58	0.00	12.96	125.03	21254.33	0.00	125.03
29/12/1965	-4.3	0	8	8	12.00	0.00	0.00	0.50	9.10	0.50	0.00	12.96	137.09	23457.46	59.29	78.89
30/12/1965	-2.8	0	0	0	12.00	0.00	0.00	0.55	9.07	0.55	0.00	12.96	81.65	15560.68	59.29	32.36
31/12/1965	-0.3	0	0	0	12.00	0.00	0.00	0.58	9.07	0.58	0.00	12.96	45.37	7703.70	59.29	0.00

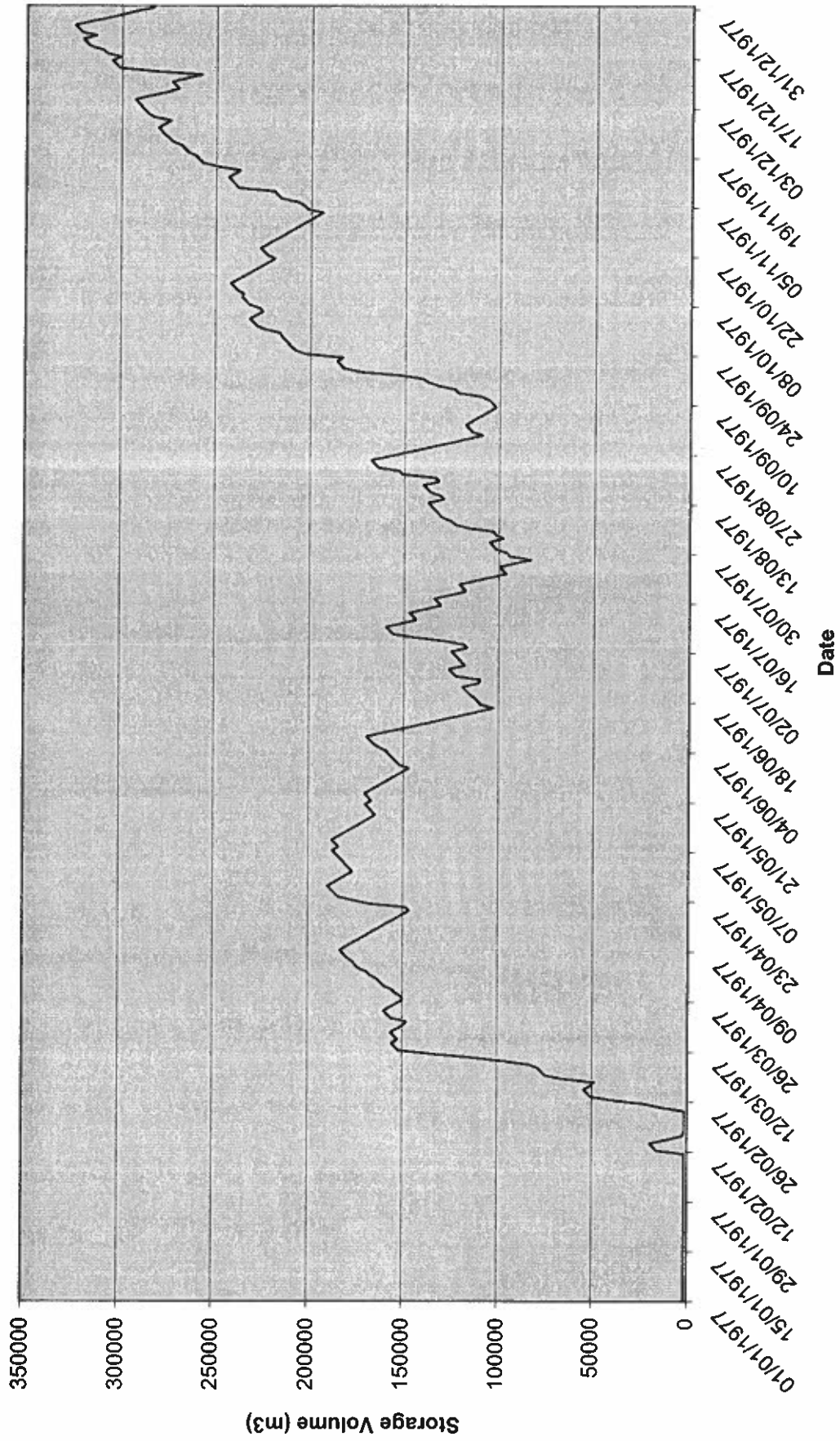
Required Storage Volume (m³) 1965-2006
Phase 1A



Township of Wainfleet
Reeb Quarry
Water Management Report

PHASE 2 WATER BALANCE

**Storage Volumes - Phase 2 Scenario (Regular Groundwater Inflow)
1977 - Highest Year Recorded**



**Running Daily Water Balance, Resh Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate k: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
31/03/1977	4.8	0.5	0	0.5	0.00	25.36	0.00	0.81	12.59	1.09	0.00	3.42	315.33	161450.89	0.00	315.33
01/04/1977	2.8	0.9	0	0.6	0.00	19.87	0.00	0.71	12.59	0.99	0.00	3.42	318.78	162131.31	0.00	318.78
02/04/1977	7.5	5	0	5	0.00	32.77	0.00	1.00	12.83	1.34	3.66	3.42	325.66	166390.00	0.00	325.66
03/04/1977	4.8	0	0	0	0.00	25.36	0.00	0.81	12.89	1.10	0.00	3.42	328.29	168392.51	0.00	328.29
04/04/1977	3.8	7	0	7	0.00	22.82	0.00	0.76	12.99	1.04	3.89	3.42	338.87	173399.85	0.00	338.87
05/04/1977	9.3	0	0	0	0.00	17.24	0.00	0.79	12.73	1.04	0.00	3.42	342.10	176152.36	0.00	342.10
06/04/1977	0	0	0	0	0.00	0.00	0.00	0.81	12.76	0.65	0.00	3.42	345.52	179005.80	0.00	345.52
07/04/1977	-1	2.2	0	2.2	0.00	0.00	0.00	0.58	12.80	0.82	1.38	3.42	350.33	182009.22	0.00	350.33
08/04/1977	-4.3	0	0	0	0.00	0.00	0.00	0.50	12.83	0.71	0.00	3.42	353.78	185122.85	0.00	353.78
09/04/1977	-1.8	0	0	0	0.00	0.00	0.00	0.59	12.85	0.82	0.00	3.42	357.18	188379.07	0.00	357.18
10/04/1977	4	0	0	0	0.00	23.18	0.00	0.81	12.90	1.19	0.00	3.42	359.79	191789.50	0.00	359.79
11/04/1977	7	0	0	0	0.00	31.39	0.00	1.00	12.83	1.38	0.00	3.42	364.34	195322.82	0.00	364.34
12/04/1977	7.3	0	0	0	0.00	32.22	0.00	1.00	12.97	1.36	0.00	3.42	371.92	199116.94	0.00	371.92
13/04/1977	11	0	0	0	0.00	42.37	0.00	1.31	13.00	1.79	0.00	3.42	381.50	203276.77	0.00	381.50
14/04/1977	7.5	0	0	0	0.00	32.77	0.00	1.00	13.03	1.39	0.00	3.42	385.08	207643.19	0.00	385.08
15/04/1977	5	0	0	0	0.00	25.91	0.00	0.87	13.07	1.22	0.00	3.42	388.67	212156.82	0.00	388.67
16/04/1977	4.8	0	0	0	0.00	25.36	0.00	0.81	13.10	1.14	0.00	3.42	392.29	216870.04	0.00	392.29
17/04/1977	7.8	0	0	0	0.00	33.04	0.00	1.00	13.14	1.40	0.00	3.42	396.89	221743.47	0.00	396.89
18/04/1977	9.3	0.2	0	0.2	0.00	37.79	0.00	1.15	13.17	1.59	0.00	3.42	402.41	226722.81	0.00	402.41
19/04/1977	14.3	0	0	0	0.00	51.42	0.00	1.80	13.20	2.19	0.00	3.42	409.00	231830.32	0.00	409.00
20/04/1977	14.3	0.8	0	0.8	0.00	51.42	0.00	1.80	13.24	2.19	0.00	3.42	416.57	237073.74	0.00	416.57
21/04/1977	15	1.8	0	1.6	0.00	53.34	0.00	1.71	13.27	2.34	0.00	3.42	424.99	242447.17	0.00	424.99
22/04/1977	10.5	36.6	0	36.6	0.00	41.00	0.00	1.23	13.31	1.72	34.88	3.42	378.30	186091.05	0.00	378.30
23/04/1977	7.3	14.2	0	14.2	0.00	32.22	0.00	1.00	13.34	1.42	12.78	3.42	344.81	179387.76	0.00	344.81
24/04/1977	9.5	13.6	0	13.6	0.00	30.02	0.00	0.94	13.37	1.35	12.27	3.42	360.76	184222.21	0.00	360.76
25/04/1977	9.8	0.8	0	0.8	0.00	28.71	0.00	0.87	13.41	1.26	0.00	3.42	365.84	188176.84	0.00	365.84
26/04/1977	5.3	0	0	0	0.00	25.73	0.00	0.87	13.44	1.23	0.00	3.42	367.05	187280.06	0.00	367.05
27/04/1977	9.8	0	0	0	0.00	30.05	0.00	0.84	13.46	1.34	0.00	3.42	370.47	188582.49	0.00	370.47
28/04/1977	5.3	0	0	0	0.00	26.73	0.00	0.87	13.51	1.26	0.00	3.42	364.05	188395.91	0.00	364.05
29/04/1977	2.8	0	0	0	0.00	19.87	0.00	0.71	13.55	1.09	0.00	3.42	357.84	183109.34	0.00	357.84
30/04/1977	8.8	0	0	0	0.00	30.85	0.00	0.84	13.58	1.35	0.00	3.42	351.22	179422.76	0.00	351.22
31/05/1977	12.8	0.6	0	0.6	0.00	47.39	0.00	1.40	13.61	1.99	0.00	3.42	344.80	178530.19	0.00	344.80
01/05/1977	10	0.2	0	0.2	0.00	39.82	0.00	1.23	13.65	1.78	0.00	3.42	348.22	178280.81	0.00	348.22
02/05/1977	9	0	0	0	0.00	35.88	0.00	1.15	13.68	1.65	0.00	3.42	351.65	180043.04	0.00	351.65
03/05/1977	9.8	11.6	0	11.8	0.00	39.06	0.00	1.15	13.72	1.88	10.14	3.42	355.37	181849.17	0.00	355.37
04/05/1977	10	1.8	0	1.8	0.00	39.82	0.00	1.23	13.75	1.78	0.02	3.42	358.82	183714.62	0.00	358.82
05/05/1977	12	0	0	0	0.00	45.11	0.00	1.40	13.78	2.02	0.00	3.42	362.24	185498.05	0.00	362.24
06/05/1977	9.3	0	0	0	0.00	37.79	0.00	1.15	13.82	1.87	0.00	3.42	365.67	187231.47	0.00	365.67
07/05/1977	7.5	1.2	0	1.2	0.00	32.77	0.00	1.00	13.85	1.47	0.00	3.42	369.25	189024.60	0.00	369.25
08/05/1977	5.8	0	0	0	0.00	28.10	0.00	0.87	13.89	1.29	0.00	3.42	362.67	185588.32	0.00	362.67
09/05/1977	9.8	0	0	0	0.00	39.08	0.00	1.15	13.92	1.68	0.00	3.42	366.10	187441.74	0.00	366.10
10/05/1977	9.5	0	0	0	0.00	38.25	0.00	1.15	13.95	1.89	0.00	3.42	369.68	189155.17	0.00	369.68
11/05/1977	11.5	0	0	0	0.00	43.74	0.00	1.31	13.99	1.92	0.00	3.42	373.29	190888.59	0.00	373.29
12/05/1977	13.5	0.4	0	0.4	0.00	48.23	0.00	1.50	14.02	2.18	0.00	3.42	349.84	177482.02	0.00	349.84
13/05/1977	9.8	0	0	0	0.00	39.25	0.00	1.15	14.04	1.79	0.00	3.42	346.42	174295.44	0.00	346.42
14/05/1977	11	0	0	0	0.00	42.37	0.00	1.31	14.09	1.94	0.00	3.42	353.00	177009.87	0.00	353.00
15/05/1977	13.5	0	0	0	0.00	48.23	0.00	1.50	14.12	2.20	0.00	3.42	327.58	187222.29	0.00	327.58
16/05/1977	16	3	0	3	0.00	56.06	0.00	1.82	14.16	2.85	0.35	3.42	321.51	184613.76	0.00	321.51
17/05/1977	16	1	0	1	0.00	56.06	0.00	1.82	14.19	2.89	0.00	3.42	324.84	186387.18	0.00	324.84
18/05/1977	15.5	0	0	0	0.00	54.71	0.00	1.71	14.23	2.80	0.00	3.42	328.38	188120.81	0.00	328.38
19/05/1977	18.5	0	0	0	0.00	62.84	0.00	2.09	14.28	3.91	0.00	3.42	331.79	189874.03	0.00	331.79
20/05/1977	20.5	2	0	2	0.00	68.43	0.00	2.34	14.29	3.39	0.00	3.42	325.37	186587.46	0.00	325.37
21/05/1977	22.8	0	0	0	0.00	74.74	0.00	2.64	14.33	3.81	0.00	3.42	328.79	188340.88	0.00	328.79
22/05/1977	21.5	0	0	0	0.00	71.17	0.00	2.49	14.36	3.61	0.00	3.42	332.22	190084.31	0.00	332.22
23/05/1977	21.5	0	0	0	0.00	71.17	0.00	2.49	14.40	3.62	0.00	3.42	335.60	191897.73	0.00	335.60
24/05/1977	21	0	0	0	0.00	69.80	0.00	2.49	14.43	3.84	0.00	3.42	339.38	193521.18	0.00	339.38
25/05/1977	17.5	0	0	0	0.00	60.20	0.00	1.84	14.46	2.87	0.00	3.42	312.95	180234.58	0.00	312.95
26/05/1977	18.5	0	0	0	0.00	57.45	0.00	1.82	14.50	2.71	0.00	3.42	308.54	176948.00	0.00	308.54
28/05/1977	19	0	0	0	0.00	64.31	0.00	2.20	14.53	3.26	0.00	3.42	300.12	152941.43	0.00	300.12
29/05/1977	13.5	0	0	0	0.00	49.23	0.00	1.50	14.57	2.27	0.00	3.42	293.70	150374.85	0.00	293.70
30/05/1977	17	0	0	0	0.00	58.83	0.00	1.84	14.60	2.81	0.00	3.42	287.29	147088.28	0.00	287.29
31/05/1977	19.8	19.6	0	19.6	0.00	65.51	0.00	2.20	14.63	3.27	19.33	3.42	297.19	152182.99	0.00	297.19
01/06/1977	18.8	1	0	1	0.00	59.28	0.00	1.82	14.67	2.74	0.00	3.42	300.62	153181.01	0.00	300.62
02/06/1977	17	1.2	0	1.2	0.00	45.11	0.00	1.40	14.70	2.15	0.00	3.42	304.04	155999.44	0.00	304.04
03/06/1977	10	0	0	0	0.00	39.82	0.00	1.23	14.74	1.90	0.00	3.42	307.47	157422.85	0.00	307.47
04/06/1977	18	1.8	0	1.8	0.00	58.08	0.00	1.82	14.77	2.77	0.00	3.42	310.89	159178.29	0.00	310.89
05/06/1977	16	6.8	0	6.6	0.00	61.57	0.00	2.05	14.81	3.19	3.47	3.42	317.79	162707.82	0.00	317.79
06/06/1977	12.8	4.8	0	4.8	0.00	47.39	0.00	1.40	14.84	2.17	2.63	3.42	323.84	165989.52	0.00	323.84
07/06/1977	10.8	0	0	0	0.00	41.82	0.00	1.23	14.87	1.92	0.00	3.42	327.27	167981.89	0.00	327.27
08/06/1977	9.8	0	0	0	0.00	39.08	0.00	1.15	14.91	1.89	0.00	3.42	330.69	169919.37	0.00	330.69
09/06/1977	13.8	0	0	0	0.00											

**Running Daily Water Balance, Reeb Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate I: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
28/05/1977	22.3	2.6	0	2.6	0.00	73.37	0.00	2.84	15.11	4.63	0.00	3.42	230.55	118036.56	0.00	230.55
29/05/1977	19.3	0	0	0	0.00	65.14	0.00	2.20	15.07	3.37	0.00	3.42	233.87	119792.66	0.00	233.87
30/05/1977	16.5	2	0	2	0.00	62.84	0.00	2.06	15.04	3.17	0.00	3.42	237.40	121548.41	0.00	237.40
31/05/1977	20.3	0	0	0	0.00	67.83	0.00	2.34	15.01	3.56	0.00	3.42	240.87	123299.83	0.00	240.87
01/06/1977	19.5	0	0	0	0.00	65.68	0.00	2.20	14.97	3.35	0.00	3.42	244.24	125053.28	19.59	224.56
02/06/1977	17.8	1.4	0	1.4	0.00	61.02	0.00	1.84	14.84	2.99	0.00	3.42	227.68	116726.68	0.00	227.68
03/06/1977	21.5	0	0	0	0.00	71.17	0.00	2.49	14.90	3.75	0.00	3.42	231.41	118480.11	0.00	231.41
04/06/1977	22.8	21.8	0	21.8	0.00	74.74	0.00	2.64	14.87	3.99	17.64	3.42	232.67	120268.00	0.00	232.67
05/06/1977	21.8	29.4	0	29.4	0.00	71.99	0.00	2.49	14.83	3.73	25.87	3.42	281.77	144266.88	0.00	281.77
06/06/1977	20.3	22.4	0	22.4	0.00	67.88	0.00	2.34	14.80	3.51	18.89	3.42	304.66	155929.14	0.00	304.66
08/06/1977	18.8	0.4	0	0.4	0.00	73.84	0.00	2.06	14.78	3.11	0.00	3.42	307.51	157443.68	0.00	307.51
09/06/1977	22	0	0	0	0.00	72.54	0.00	2.84	14.73	3.93	0.00	3.42	310.83	159196.09	19.59	291.24
10/06/1977	19.8	0	0	0	0.00	66.81	0.00	2.20	14.70	3.28	0.00	3.42	284.87	150870.41	19.59	274.58
11/06/1977	20	0	0	0	0.00	67.06	0.00	2.34	14.66	3.48	2.52	3.42	280.92	143831.68	0.00	280.92
12/06/1977	23.5	0	0	0	0.00	76.05	0.00	2.81	14.63	4.13	0.00	3.42	284.35	145485.10	0.00	284.35
13/06/1977	22.5	0	0	0	0.00	73.81	0.00	2.64	14.59	3.88	0.00	3.42	287.77	147238.53	19.59	268.08
14/06/1977	20.5	0	0	0	0.00	68.43	0.00	2.34	14.56	3.45	0.00	3.42	271.61	139011.95	19.59	251.82
15/06/1977	24.8	0.8	0	0.8	0.00	80.22	0.00	2.99	14.52	4.34	0.00	3.42	255.24	130685.38	0.00	255.24
16/06/1977	25	0.4	0	0.4	0.00	80.77	0.00	3.17	14.49	4.69	0.00	3.42	258.87	132438.80	0.00	258.87
17/06/1977	24.5	0	0	0	0.00	79.40	0.00	2.99	14.45	4.32	0.00	3.42	262.09	134192.22	19.59	242.41
18/06/1977	25.3	0	0	0	0.00	81.69	0.00	3.17	14.42	4.66	0.00	3.42	245.83	125965.65	19.59	226.14
19/06/1977	24.3	0.8	0	0.8	0.00	78.85	0.00	2.99	14.39	4.30	0.00	3.42	229.57	117539.06	0.00	229.57
20/06/1977	24.3	0	0	0	0.00	78.85	0.00	2.99	14.35	4.29	0.00	3.42	232.89	119292.50	0.00	232.89
21/06/1977	28	0	0	0	0.00	83.52	0.00	3.35	14.32	4.79	0.00	3.42	236.42	121045.93	19.59	216.73
22/06/1977	20.5	0	0	0	0.00	68.43	0.00	2.34	14.26	3.39	0.00	3.42	220.15	112719.35	19.59	200.47
23/06/1977	21.3	0	0	0	0.00	70.82	0.00	2.49	14.25	3.59	0.00	3.42	203.89	104362.77	19.59	184.20
24/06/1977	23	4.1	0	4.1	0.00	75.29	0.00	2.81	14.21	4.02	0.00	3.42	187.71	96107.97	0.00	187.71
25/06/1977	21.8	0.4	0	0.4	0.00	71.17	0.00	2.49	14.18	3.87	0.00	3.42	191.14	97861.40	0.00	191.14
26/06/1977	18	0	0	0	0.00	67.45	0.00	1.82	14.15	2.95	0.00	3.42	184.56	99514.82	19.59	174.87
27/06/1977	18	0	0	0	0.00	66.08	0.00	1.82	14.11	2.84	0.00	3.42	178.30	91288.25	19.59	158.81
28/06/1977	21.3	0	0	0	0.00	70.82	0.00	2.49	14.08	3.54	0.00	3.42	182.03	82951.67	19.59	142.35
29/06/1977	22.8	42.2	0	42.2	0.00	74.74	0.00	2.84	14.04	3.74	38.46	3.42	184.23	84327.78	0.00	184.23
30/06/1977	21.8	0	0	0	0.00	71.99	0.00	2.49	14.01	3.52	0.00	3.42	187.66	86081.19	0.00	187.66
01/07/1977	22.3	11.4	0	11.4	0.00	73.37	0.00	2.84	13.97	3.73	7.67	3.42	188.78	90153.84	0.00	188.78
01/08/1977	21.5	0	0	0	0.00	71.17	0.00	2.49	13.94	3.51	0.00	3.42	202.18	103312.28	0.00	202.18
02/08/1977	21	0	0	0	0.00	67.06	0.00	2.34	13.90	3.30	0.00	3.42	205.61	105270.66	19.59	185.92
03/08/1977	23	5.4	0	5.4	0.00	75.29	0.00	2.81	13.87	3.82	1.48	3.42	199.82	97701.32	0.00	199.82
04/08/1977	23	8	0	8	0.00	75.29	0.00	2.81	13.84	3.81	4.08	3.42	188.34	101548.12	0.00	188.34
05/08/1977	22.3	1	0	1	0.00	73.37	0.00	2.84	13.80	3.68	0.00	3.42	201.78	103301.65	0.00	201.78
06/08/1977	20	26.2	0	26.2	0.00	75.29	0.00	2.81	13.77	3.89	22.31	3.42	227.49	118476.72	0.00	227.49
07/08/1977	21.8	13.8	0	13.8	0.00	71.99	0.00	2.49	13.73	3.42	10.35	3.42	241.77	123129.40	0.00	241.77
08/08/1977	22.8	4.8	0	4.8	0.00	74.74	0.00	2.84	13.70	3.65	1.15	3.42	245.85	125873.81	0.00	245.85
09/08/1977	20.5	9	0	9	0.00	68.43	0.00	2.34	13.66	3.24	5.78	3.42	255.03	130575.19	0.00	255.03
10/08/1977	22.3	1.8	0	1.8	0.00	73.37	0.00	2.84	13.63	3.63	0.00	3.42	258.45	132328.61	0.00	258.45
11/08/1977	23.5	4	0	4	0.00	76.05	0.00	2.81	13.59	3.84	0.18	3.42	262.04	134185.62	0.00	262.04
12/08/1977	19.5	0	0	0	0.00	62.84	0.00	2.06	13.56	2.89	0.00	3.42	265.47	135919.04	0.00	265.47
13/08/1977	21.5	0.2	0	0.2	0.00	71.17	0.00	2.49	13.53	3.40	0.00	3.42	268.89	137672.47	19.59	249.20
14/08/1977	22.3	0	0	0	0.00	73.37	0.00	2.84	13.49	3.63	0.00	3.42	252.63	129545.89	0.00	252.63
15/08/1977	18	0	0	0	0.00	61.02	0.00	1.84	13.46	2.87	0.00	3.42	256.05	131399.32	0.00	256.05
16/08/1977	20.5	10.8	0	10.8	0.00	68.43	0.00	2.34	13.42	3.18	7.62	3.42	267.69	136751.77	0.00	267.69
17/08/1977	20	0.2	0	0.2	0.00	67.06	0.00	2.34	13.39	3.18	0.00	3.42	270.62	138505.20	0.00	270.62
18/08/1977	15.3	0	0	0	0.00	54.16	0.00	1.71	13.35	2.35	0.00	3.42	273.84	140258.62	19.59	254.20
18/08/1977	15	2.8	0	2.8	0.00	53.34	0.00	1.71	13.32	2.35	0.45	3.42	258.13	132193.28	0.00	258.13
20/08/1977	13	0	0	0	0.00	47.85	0.00	1.50	13.28	2.07	0.00	3.42	261.56	133919.71	0.00	261.56
21/08/1977	15.5	32.8	0	32.8	0.00	67.45	0.00	1.82	13.25	2.46	30.12	3.42	265.19	135692.85	0.00	265.19
22/08/1977	17.8	0	0	0	0.00	61.02	0.00	1.84	13.22	2.62	0.00	3.42	268.53	137489.06	0.00	268.53
23/08/1977	19.5	21	0	21	0.00	65.68	0.00	2.20	13.18	2.95	18.05	3.42	320.00	163841.84	0.00	320.00
24/08/1977	18	0	0	0	0.00	56.08	0.00	1.82	13.15	2.46	0.00	3.42	323.43	165595.36	0.00	323.43
25/08/1977	13.8	0	0	0	0.00	60.05	0.00	1.50	13.11	2.04	0.00	3.42	326.85	167348.78	19.59	307.17
26/08/1977	18.8	0	0	0	0.00	63.78	0.00	2.06	13.08	2.75	0.00	3.42	310.59	159022.21	19.59	290.80
27/08/1977	23.5	0	0	0	0.00	76.05	0.00	2.81	13.04	3.66	0.00	3.42	284.33	150595.62	19.59	274.84
28/08/1977	25.3	0	0	0	0.00	81.59	0.00	3.17	13.01	4.11	0.00	3.42	278.09	142309.05	19.59	258.38
29/08/1977	24.3	0.4	0	0.4	0.00	78.85	0.00	2.99	12.97	3.88	0.00	3.42	281.80	144042.46	19.59	242.11
30/08/1977	18.5	0	0	0	0.00	62.84	0.00	2.06	12.94	2.73	0.00	3.42	245.84	125715.81	19.59	225.85
31/08/1977	20.8	0	0	0	0.00	69.25	0.00	2.34	12.81	3.05	0.00	3.42	229.28	117369.33	19.59	209.59
01/09/1977	24.8	0	0	0	0.00	80.22	0.00	2.99	12.87	3.84	0.00	3.42	213.01	109092.79	8.84	203.17
02/09/1977	23	20.5	0	20.5	0.00	75.29	0.00	2.81	12.84	3.63	17.17	3.42	223.75	114567.67	0.00	223.75
03/09/1977	19.8	0.2	0	0.2	0.00	66.81	0.00	2.20	12.80	2.66	0.00	3.42	227.19	116321.06	0.00	227.19
04/09/1977	18.3	0	0	0	0.00	62.39	0.00	2.05	12.77	2.69	0.00	3.42	230.61	118074.52	8.84	220.77
05/09/1977	22.5	0	0	0	0.00	73.81	0.00	2.64	12.73	3.39	0.00	3.42	224.20	114787.94</		

**Running Daily Water Balance, Reeb Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate I: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0825 m³/s
19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
25/09/1977	18.3	9	0	9	0.00	82.39	0.00	2.06	12.06	2.54	6.48	3.42	408.14	207945.17	0.00	408.14
26/09/1977	18	3.4	0	3.4	0.00	81.57	0.00	2.06	12.03	2.54	6.66	3.42	410.43	210138.55	0.00	410.43
27/09/1977	18	0.4	0	0.4	0.00	58.06	0.00	1.82	12.00	2.25	0.00	3.42	413.85	211891.87	0.00	413.85
28/09/1977	15	0.2	0	0.2	0.00	33.34	0.00	1.71	11.87	2.11	0.00	3.42	417.28	213845.40	0.00	417.28
29/09/1977	11.3	0	0	0	0.00	42.18	0.00	1.31	11.94	1.54	0.00	3.42	420.70	215938.82	0.00	420.70
30/09/1977	15.5	10.7	0	10.7	0.00	54.71	0.00	1.71	11.91	2.10	8.50	3.42	422.89	218151.78	0.00	422.89
01/10/1977	12.9	13.6	0	13.6	0.00	47.30	0.00	1.40	11.87	1.74	11.88	3.42	428.18	224545.90	0.00	428.18
02/10/1977	9	6.3	0	6.3	0.00	38.88	0.00	1.15	11.84	1.44	4.88	3.42	435.31	228589.81	0.00	435.31
03/10/1977	10	0	0	0	0.00	39.82	0.00	1.23	11.81	1.59	0.00	3.42	440.89	230543.23	0.00	440.89
04/10/1977	12.9	0	0	0	0.00	45.83	0.00	1.40	11.78	1.72	0.00	3.42	445.31	232095.65	0.00	445.31
05/10/1977	13	0.4	0	0.4	0.00	47.89	0.00	1.50	11.75	1.89	0.00	3.42	448.89	22810.06	0.00	448.89
06/10/1977	10.8	0.2	0	0.2	0.00	41.82	0.00	1.23	11.72	1.51	0.00	3.42	449.48	225523.50	0.00	449.48
07/10/1977	7.5	0	0	0	0.00	32.77	0.00	1.00	11.69	1.24	0.00	3.42	443.90	227278.93	0.00	443.90
08/10/1977	11	18.4	0	18.4	0.00	42.37	0.00	1.31	11.66	1.60	18.80	3.42	454.28	232560.04	0.00	454.28
09/10/1977	10.3	0.2	0	0.2	0.00	40.45	0.00	1.23	11.63	1.50	0.00	3.42	457.70	234843.47	0.00	457.70
10/10/1977	10.5	0	0	0	0.00	41.09	0.00	1.23	11.60	1.50	0.00	3.42	459.11	235905.89	0.00	459.11
11/10/1977	13.5	7	0	7	0.00	48.22	0.00	1.50	11.57	1.60	8.20	3.42	459.81	235472.78	0.00	459.81
12/10/1977	8.3	4	0	4	0.00	34.95	0.00	1.07	11.54	1.31	2.88	3.42	465.02	236803.33	0.00	465.02
13/10/1977	5.3	0	0	0	0.00	28.73	0.00	0.87	11.50	1.07	0.00	3.42	469.45	240358.75	0.00	469.45
14/10/1977	3	0	0	0	0.00	25.81	0.00	0.87	11.47	1.07	0.00	3.42	472.87	242110.18	0.00	472.87
15/10/1977	9.9	0.4	0	0.4	0.00	39.05	0.00	1.15	11.44	1.38	0.00	3.42	469.45	238823.60	0.00	469.45
16/10/1977	4.8	0	0	0	0.00	24.84	0.00	0.81	11.41	1.00	0.00	3.42	460.03	239537.02	0.00	460.03
17/10/1977	9	9.2	0	9.2	0.00	28.65	0.00	0.84	11.38	1.14	0.00	3.42	453.61	23259.45	0.00	453.61
18/10/1977	8.8	0	0	0	0.00	38.33	0.00	1.07	11.35	1.29	0.00	3.42	447.20	228863.87	0.00	447.20
19/10/1977	10.5	0	0	0	0.00	41.00	0.00	1.23	11.32	1.46	0.00	3.42	440.78	225877.30	0.00	440.78
20/10/1977	8	0	0	0	0.00	34.14	0.00	1.07	11.29	1.28	0.00	3.42	434.36	222890.72	0.00	434.36
21/10/1977	11.3	1	0	1	0.00	43.19	0.00	1.31	11.26	1.55	0.00	3.42	427.94	219104.15	0.00	427.94
22/10/1977	12	8	0	8	0.00	45.11	0.00	1.40	11.23	1.65	4.35	3.42	433.72	220987.20	0.00	433.72
23/10/1977	6.9	0	0	0	0.00	39.85	0.00	0.84	11.20	1.11	0.00	3.42	429.14	224840.63	0.00	429.14
24/10/1977	9.5	7	0	7	0.00	38.25	0.00	1.15	11.16	1.35	0.00	3.42	424.95	226584.05	0.00	424.95
25/10/1977	14.5	0	0	0	0.00	51.87	0.00	1.80	11.13	1.84	0.00	3.42	426.15	223307.48	0.00	426.15
26/10/1977	16.3	0	0	0	0.00	58.91	0.00	1.82	11.10	2.08	0.00	3.42	429.73	220020.80	0.00	429.73
27/10/1977	10.6	0	0	0	0.00	41.00	0.00	1.23	11.07	1.43	0.00	3.42	423.31	218734.33	0.00	423.31
28/10/1977	9.8	0	0	0	0.00	39.05	0.00	1.15	11.04	1.33	0.00	3.42	418.89	215447.75	0.00	418.89
29/10/1977	8.5	0	0	0	0.00	35.81	0.00	1.07	11.01	1.25	0.00	3.42	410.47	210181.18	0.00	410.47
30/10/1977	8.5	0	0	0	0.00	35.81	0.00	1.07	10.98	1.25	0.00	3.42	404.05	205874.80	0.00	404.05
31/10/1977	8.5	0	0	0	0.00	38.08	0.00	1.15	10.95	1.32	0.00	3.42	397.63	203588.02	0.00	397.63
01/11/1977	13	0	0	0	0.00	47.85	0.00	1.50	10.92	1.70	0.00	3.42	391.21	200201.45	0.00	391.21
02/11/1977	14.5	0	0	0	0.00	51.87	0.00	1.80	10.89	1.80	0.00	3.42	384.79	197014.87	0.00	384.79
03/11/1977	16.3	1.8	0	1.8	0.00	58.91	0.00	1.82	10.86	2.09	0.00	3.42	378.37	193728.30	0.00	378.37
04/11/1977	14.8	14.8	0	14.8	0.00	52.79	0.00	1.60	10.83	1.79	13.01	3.42	364.81	202142.85	0.00	364.81
05/11/1977	9.5	0	0	0	0.00	38.25	0.00	1.15	10.79	1.21	0.00	3.42	359.22	203985.87	0.00	359.22
06/11/1977	12.3	4.8	0	4.8	0.00	45.82	0.00	1.40	10.76	1.58	3.22	3.42	404.88	207300.20	0.00	404.88
07/11/1977	13	15.4	0	15.4	0.00	47.85	0.00	1.50	10.73	1.67	13.73	3.42	422.03	210881.74	0.00	422.03
08/11/1977	12.5	0.8	0	0.8	0.00	46.48	0.00	1.40	10.70	1.57	0.00	3.42	425.46	217835.17	0.00	425.46
09/11/1977	13.8	0.2	0	0.2	0.00	50.05	0.00	1.50	10.67	1.66	0.00	3.42	428.88	219588.59	0.00	428.88
10/11/1977	10.8	2.8	8	34	8.00	41.82	8.00	1.23	10.64	1.37	32.63	3.42	464.84	239948.10	0.00	464.84
11/11/1977	2	1.2	0	1.2	0.00	17.88	0.00	0.71	10.61	0.81	0.38	3.42	458.75	240500.84	0.00	458.75
12/11/1977	-1	0	0	0	0.00	0.00	0.00	0.58	10.58	0.67	0.00	3.42	472.18	241154.07	0.00	472.18
13/11/1977	-1	0	0	0	0.00	0.00	0.00	0.58	10.55	0.57	0.00	3.42	475.80	243307.49	0.00	475.80
14/11/1977	0.8	0	0	0	0.00	0.00	0.00	0.81	10.52	0.70	0.00	3.42	469.18	240220.81	0.00	469.18
15/11/1977	7.6	2	0	2	0.00	32.77	0.00	1.00	10.49	1.12	0.88	3.42	463.55	237387.22	0.00	463.55
16/11/1977	10	20.2	0	20.2	0.00	39.82	0.00	1.23	10.46	1.35	18.85	3.42	465.72	246791.38	0.00	465.72
17/11/1977	9	14	0	14	0.00	28.85	0.00	0.84	10.42	1.04	12.88	3.42	462.31	237189.17	0.00	462.31
18/11/1977	4.8	0	0	0	0.00	24.84	0.00	0.81	10.39	0.81	0.00	3.42	455.79	234033.89	0.00	455.79
19/11/1977	3.5	0.8	0	0.8	0.00	21.79	0.00	0.78	10.36	0.65	0.00	3.42	450.15	230887.92	0.00	450.15
20/11/1977	6	4.8	0	4.8	0.00	28.85	0.00	0.84	10.33	1.03	3.77	3.42	418.33	244370.13	0.00	418.33
21/11/1977	7.6	1.8	0	1.8	0.00	32.77	0.00	1.00	10.30	1.10	0.50	3.42	420.28	246631.71	0.00	420.28
22/11/1977	0.6	0	0	0	0.00	0.00	0.00	0.81	10.27	0.68	0.00	3.42	423.70	248135.14	0.00	423.70
23/11/1977	-4.8	8.8	0	8.8	0.00	23.38	0.00	0.81	10.24	0.69	6.81	3.42	433.03	247813.28	0.00	433.03
24/11/1977	5.8	0	0	0	0.00	28.10	0.00	0.87	10.21	0.95	0.00	3.42	438.46	247458.70	0.00	438.46
25/11/1977	-4.8	1.8	0	1.8	0.00	29.42	0.00	0.78	10.18	0.63	0.77	3.42	440.85	247891.16	0.00	440.85
26/11/1977	0.8	0	3.1	3.1	3.10	0.00	0.81	10.15	0.57	0.00	3.42	444.08	247888.59	0.00	444.08	
27/11/1977	-2.5	0	5.1	5.1	5.10	0.00	0.55	10.12	0.52	0.00	3.42	447.80	248020.01	0.00	447.80	
28/11/1977	-2	0	2.5	2.5	11.70	0.00	0.00	10.09	0.54	0.00	3.42	441.08	247033.43	0.00	441.08	
29/11/1977	-1.5	0	0	0	11.70	0.00	0.00	0.58	10.05	0.54	0.00	3.42	434.66	247346.86	0.00	434.66
30/11/1977	2.5	13.3	0	13.3	11.70	19.65	11.70	0.71	10.02	0.75	24.74	3.42	452.49	248268.86	0.00	452.49
31/12/1977	5.5	3.4	0	3.4	0.00	27.28	0.00	0.87	9.99	0.87	2.41	3.42	458.42	248585.80	0.00	458.42
02/12/1977	2.5	0.2	0	0.2	0.00	19.95	0.00	0.71	9.96	0.78	0.00	3.42	451.80	247839.32	0.00	451.80
03/12/1977	-0.3	0.8	0	0.6	0.00	0.00	0.00	0.58	9.93	0.63	0.00	3.42	455.22	248932.75	0.00	455.22
04/12/1977	-1.8	0														

**Running Daily Water Balance, Reeb Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate I: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
19.69 mm 9.84 mm

Groundwater Inflow: 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area: 51.2 ha
Max. Storage Volume: 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/01/1971	-4.2	0	0	0	33.40	0.00	0.00	0.60	9.07	0.50	0.00	3.42	3.42	1753.42	19.69	0.00
02/01/1971	-2.5	0	0	0	33.40	0.00	0.00	0.55	9.11	0.55	0.00	3.42	3.42	1753.42	19.69	0.00
03/01/1971	0.6	2.5	0	2.5	33.40	0.00	0.00	0.81	9.15	0.81	1.89	3.42	3.42	1753.42	19.69	3.32
04/01/1971	3.4	2.3	0	2.3	33.40	21.52	21.52	0.78	9.19	0.78	23.07	3.42	3.42	1753.42	19.69	31.81
05/01/1971	-2.2	0	0	0	11.88	0.00	0.00	0.55	9.23	0.58	0.00	3.42	3.42	1753.42	19.69	35.23
06/01/1971	-7.8	0	0	0	11.88	0.00	0.00	0.41	9.27	0.43	0.00	3.42	3.42	1753.42	19.69	38.65
07/01/1971	-10.3	0	0	0	11.88	0.00	0.00	0.27	9.31	0.29	0.00	3.42	3.42	1753.42	19.69	42.07
08/01/1971	-6.1	0	0	0	11.88	0.00	0.00	0.38	9.35	0.40	0.00	3.42	3.42	1753.42	19.69	45.49
09/01/1971	-5.8	0	0	0	11.88	0.00	0.00	0.47	9.39	0.49	0.00	3.42	3.42	1753.42	19.69	48.91
10/01/1971	-3.8	0	0	0	11.88	0.00	0.00	0.64	9.43	0.66	0.00	3.42	3.42	1753.42	19.69	52.33
11/01/1971	-0.8	0	0.3	0.3	12.18	0.00	0.00	0.98	9.47	0.99	0.00	3.42	3.42	1753.42	19.69	55.75
12/01/1971	-1.0	0	0	0	12.18	0.00	0.00	0.20	9.51	0.31	0.00	3.42	3.42	1753.42	19.69	59.17
13/01/1971	-5.9	1.5	0	1.5	12.18	0.00	0.00	0.47	9.55	0.50	1.00	3.42	3.42	1753.42	19.69	62.59
14/01/1971	-3.1	0	0	0	12.18	0.00	0.00	0.62	9.59	0.65	0.00	3.42	3.42	1753.42	19.69	66.01
15/01/1971	-5	0	2	2	14.18	0.00	0.00	0.50	9.63	0.53	0.00	3.42	3.42	1753.42	19.69	69.43
16/01/1971	-3.2	0	0	0	14.18	0.00	0.00	0.28	9.67	0.29	0.00	3.42	3.42	1753.42	19.69	72.85
17/01/1971	-8.5	0	1.3	1.3	16.68	0.00	0.00	0.55	9.84	0.61	0.00	3.42	3.42	1753.42	19.69	76.27
18/01/1971	-15.8	0	1.5	1.5	18.68	0.00	0.00	0.21	9.74	0.24	0.00	3.42	3.42	1753.42	19.69	79.69
19/01/1971	-14.7	0	1	1	17.68	0.00	0.00	0.22	9.78	0.25	0.00	3.42	3.42	1753.42	19.69	83.11
20/01/1971	-9.2	0	1.6	1.6	18.78	0.00	0.00	0.29	9.82	0.32	0.00	3.42	3.42	1753.42	19.69	86.53
21/01/1971	0.3	0	5.1	5.1	24.88	0.00	0.00	0.52	9.86	0.67	0.00	3.42	3.42	1753.42	19.69	90.95
22/01/1971	-3.3	0	0.5	0.5	25.38	0.00	0.00	0.81	9.90	0.89	0.00	3.42	3.42	1753.42	19.69	95.37
23/01/1971	-2.8	0	0	0	25.38	0.00	0.00	0.55	9.94	0.57	0.00	3.42	3.42	1753.42	19.69	99.79
24/01/1971	-0.3	0	0.6	0.6	25.88	0.00	0.00	0.58	9.98	0.63	0.00	3.42	3.42	1753.42	19.69	104.21
25/01/1971	1.7	3.8	0	3.8	25.88	18.88	18.88	0.68	10.02	0.71	18.74	3.42	3.42	1753.42	19.69	108.63
26/01/1971	-4.8	0	3.8	3.8	12.88	0.00	0.00	0.50	10.06	0.55	0.00	3.42	3.42	1753.42	19.69	113.05
27/01/1971	-14.2	0	0	0	12.88	0.00	0.00	0.22	10.10	0.28	0.00	3.42	3.42	1753.42	19.69	117.47
28/01/1971	-11.7	0	0.1	0.1	18.78	0.00	0.00	0.28	10.14	0.30	0.00	3.42	3.42	1753.42	19.69	121.89
29/01/1971	-9.2	0	11.2	11.2	29.88	0.00	0.00	0.28	10.18	0.33	0.00	3.42	3.42	1753.42	19.69	126.31
30/01/1971	-8.5	0	0.5	0.5	30.38	0.00	0.00	0.26	10.22	0.33	0.00	3.42	3.42	1753.42	19.69	130.73
31/01/1971	-16.1	0	0.5	0.5	30.38	0.00	0.00	0.20	10.26	0.23	0.00	3.42	3.42	1753.42	19.69	135.15
01/02/1971	-18.9	0	0	0	30.38	0.00	0.00	0.20	10.30	0.23	0.00	3.42	3.42	1753.42	19.69	139.57
02/02/1971	-15.8	0	0	0	30.38	0.00	0.00	0.21	10.34	0.25	0.00	3.42	3.42	1753.42	19.69	144.00
03/02/1971	-10.3	0	0	0	30.38	0.00	0.00	0.27	10.38	0.32	0.00	3.42	3.42	1753.42	19.69	148.42
04/02/1971	-2.6	8.4	0	8.4	30.38	0.00	0.00	0.55	10.42	0.84	8.78	3.42	3.42	1753.42	19.69	152.84
05/02/1971	1.4	3	0	3	30.38	18.03	18.03	0.66	10.46	0.75	18.79	3.42	3.42	1753.42	19.69	157.26
06/02/1971	-2.5	0	0	0	14.88	0.00	0.00	0.85	10.50	0.84	0.00	3.42	3.42	1753.42	19.69	161.68
07/02/1971	-4.7	0	2.5	2.5	17.38	0.00	0.00	0.59	10.54	0.59	0.00	3.42	3.42	1753.42	19.69	166.10
08/02/1971	-2	0	18.8	18.8	26.19	0.00	0.00	0.58	10.58	0.58	0.00	3.42	3.42	1753.42	19.69	170.52
09/02/1971	-8.1	0	2	2	28.19	0.00	0.00	0.38	10.62	0.40	0.00	3.42	3.42	1753.42	19.69	174.94
10/02/1971	-10.3	0	4.8	4.8	42.79	0.00	0.00	0.27	10.66	0.33	0.00	3.42	3.42	1753.42	19.69	179.36
11/02/1971	-3.3	0	0	0	42.79	0.00	0.00	0.62	10.70	0.62	0.00	3.42	3.42	1753.42	19.69	183.78
12/02/1971	1.4	5.8	0.8	6.4	43.59	18.03	18.03	0.96	10.74	0.77	20.87	3.42	3.42	1753.42	19.69	188.20
13/02/1971	-7.8	0	1.5	1.5	29.09	0.00	0.00	0.41	10.78	0.50	0.00	3.42	3.42	1753.42	19.69	192.62
14/02/1971	-10.3	0	7.1	7.1	36.18	0.00	0.00	0.27	10.82	0.34	0.00	3.42	3.42	1753.42	19.69	197.04
15/02/1971	-5.3	0	0	0	36.18	0.00	0.00	0.47	10.86	0.58	0.00	3.42	3.42	1753.42	19.69	201.46
16/02/1971	-4.5	0	0	0	36.18	0.00	0.00	0.50	10.90	0.60	0.00	3.42	3.42	1753.42	19.69	205.88
17/02/1971	-1.1	0.8	4.8	5.6	30.78	0.00	0.00	0.64	10.94	0.83	0.17	3.42	3.42	1753.42	19.69	210.30
18/02/1971	0.8	0	0	0	40.78	0.00	0.00	0.81	10.98	0.87	0.00	3.42	3.42	1753.42	19.69	214.72
19/02/1971	2	3	0	3	40.78	17.68	17.68	0.71	11.02	0.84	18.84	3.42	3.42	1753.42	19.69	219.14
20/02/1971	3.8	1.5	0	1.5	23.88	22.07	22.07	0.76	11.06	0.90	22.85	3.42	3.42	1753.42	19.69	223.56
21/02/1971	-0.8	0	0	0	1.01	0.00	0.00	0.68	11.10	0.71	0.00	3.42	3.42	1753.42	19.69	227.98
22/02/1971	-0.9	14.5	0	14.5	1.01	0.00	0.00	0.58	11.14	0.71	13.79	3.42	3.42	1753.42	19.69	232.40
23/02/1971	0.8	0	0	0	1.01	0.00	0.00	0.61	11.18	0.74	0.00	3.42	3.42	1753.42	19.69	236.82
24/02/1971	-3.3	0	0.8	0.8	1.81	0.00	0.00	0.58	11.22	0.71	0.00	3.42	3.42	1753.42	19.69	241.24
25/02/1971	1.1	0	0	0	1.81	15.21	1.81	0.66	11.26	0.60	1.01	3.42	3.42	1753.42	19.69	245.66
26/02/1971	5.8	2.3	0	2.3	0.00	28.10	0.00	0.87	11.30	1.05	1.25	3.42	3.42	1753.42	19.69	250.08
27/02/1971	3.7	0	0	0	0.00	22.34	0.00	0.78	11.34	0.93	0.00	3.42	3.42	1753.42	19.69	254.50
28/02/1971	1.1	0	0	0	0.00	15.21	0.00	0.80	11.38	0.81	0.00	3.42	3.42	1753.42	19.69	258.92
01/03/1971	-0.9	0	0	0	0.00	0.00	0.00	0.68	11.42	0.73	0.00	3.42	3.42	1753.42	19.69	263.34
02/03/1971	-2.8	0	0	0	0.00	0.00	0.00	0.59	11.46	0.70	0.00	3.42	3.42	1753.42	19.69	267.76
03/03/1971	-5.8	0	9.1	9.1	9.10	0.00	0.00	0.47	11.50	0.60	0.00	3.42	3.42	1753.42	19.69	272.18
04/03/1971	-5.9	0	0	0	9.10	0.00	0.00	0.47	11.54	0.60	0.00	3.42	3.42	1753.42	19.69	276.60
05/03/1971	-2.8	0	0	0	9.10	0.00	0.00	0.55	11.58	0.71	0.00	3.42	3.42	1753.42	19.69	281.02
06/03/1971	2	10.4	0	10.4	9.10	17.68	9.10	0.71	11.62	0.89	18.81	3.42	3.42	1753.42	19.69	285.44
07/03/1971	-0.8	0	0	0	0.00	0.00	0.00	0.58	11.66	0.74	0.00	3.42	3.42	1753.42	19.69	289.86
08/03/1971	-5.4	0	4.8	4.8	1.89	0.00	0.00	0.44	11.70	0.57	0.00	3.42	3.42	1753.42	19.69	294.28
09/03/1971	-2.8	0	0	0	1.89	0.00	0.00	0.61	11.74	0.65	0.00	3.42	3.42	1753.42	19.69	298.70
10/03/1971	-4.4	0	6.8	6.8	11.20	0.00	0.00	0.50	11.78	0.65	0.00	3.42	3.42	1753.42	19.69	303.12
11/03/1971	-1.7	0	0	0	11.20	0.00	0.00	0.58	11.82	0.76	0.00	3.42	3.42	1753.42	19.69	307.54
12/03/1971	-3.8	0	0	0	11.20	0.00	0.00	0.52	11.86	0.69	0.00	3.42	3.42	1753.42	19.69	311.96
13/03/1971	0.8	0	0	0	11.20	0.00	0.00	0.61	11.90	0.79	0.0					

**Running Daily Water Balance, Reab Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate I: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
31/03/1971	-0.3	0.5	0	0.5	0.00	0.00	0.00	0.68	12.56	0.80	0.00	3.42	5.77	2853.34	0.00	5.77
01/04/1971	7.1	3.8	0	3.8	0.00	31.39	0.00	1.00	12.59	1.34	2.49	3.42	11.85	5885.35	0.00	11.85
02/04/1971	3.1	9.3	0	9.3	0.00	20.70	0.00	0.78	12.63	1.03	0.00	3.42	15.08	7718.77	0.00	15.08
03/04/1971	1.4	0	0	0	0.00	18.03	0.00	0.66	12.66	0.90	0.00	3.42	18.50	9472.19	0.00	18.50
04/04/1971	-2	0	0	0	0.00	0.00	0.00	0.58	12.69	0.81	0.00	3.42	12.06	8155.82	0.00	12.06
05/04/1971	-2	0	0	0	0.00	0.00	0.00	0.58	12.73	0.81	0.00	3.42	8.08	2889.04	0.00	8.08
06/04/1971	0.9	0	0	0	0.00	0.00	0.00	0.61	12.76	0.85	0.00	3.42	3.42	1763.42	0.00	3.42
07/04/1971	3.1	0	0	0	0.00	20.70	0.00	0.78	12.80	1.05	0.00	3.42	3.42	1763.42	0.00	3.42
08/04/1971	1.7	0	0	0	0.00	18.95	0.00	0.66	12.83	0.81	0.00	3.42	3.42	1763.42	0.00	3.42
09/04/1971	7.5	3.8	1.3	6.1	1.34	32.77	1.30	1.00	12.86	1.37	3.73	3.42	7.16	2663.99	0.00	7.16
10/04/1971	3.9	0	0	0	0.00	22.07	0.00	0.79	12.90	1.06	0.00	3.42	10.58	5417.42	0.00	10.58
11/04/1971	3.4	0	0	0	0.00	21.52	0.00	0.76	12.93	1.06	0.00	3.42	14.01	7170.84	0.00	14.01
12/04/1971	6.5	2.5	0	2.5	0.00	38.25	0.00	1.15	12.97	1.87	0.93	3.42	6.52	4390.80	0.00	6.52
13/04/1971	8.6	11.7	0	11.7	0.00	35.78	0.00	1.07	13.00	1.48	10.22	3.42	22.17	11349.46	0.00	22.17
14/04/1971	2.6	0	0	0	0.00	19.06	0.00	0.71	13.03	0.99	0.00	3.42	25.59	13192.89	0.00	25.59
15/04/1971	1.4	0	0	0	0.00	16.03	0.00	0.66	13.07	0.83	0.00	3.42	29.02	14856.31	0.00	29.02
16/04/1971	7.2	0	0	0	0.00	31.84	0.00	1.00	13.10	1.49	0.00	3.42	32.44	11599.74	0.00	32.44
17/04/1971	5.9	0	0	0	0.00	28.38	0.00	0.87	13.14	1.22	0.00	3.42	16.18	8263.16	0.00	16.18
18/04/1971	7.8	0	0	0	0.00	33.59	0.00	1.00	13.17	1.40	0.00	3.42	9.78	4996.59	0.00	9.78
19/04/1971	4.5	0	0	0	0.00	24.84	0.00	0.81	13.20	1.15	0.00	3.42	3.42	1763.42	0.00	3.42
20/04/1971	5.3	0	0	0	0.00	26.73	0.00	0.87	13.24	1.24	0.00	3.42	3.42	1763.42	0.00	3.42
21/04/1971	8.8	0.5	0	0.5	0.00	27.55	0.00	0.87	13.27	1.24	0.00	3.42	3.42	1763.42	0.00	3.42
22/04/1971	7.5	0	0	0	0.00	32.77	0.00	1.00	13.31	1.52	0.00	3.42	6.85	3206.82	0.00	6.85
23/04/1971	5.8	1.3	0	1.3	0.00	28.10	0.00	0.87	13.34	1.24	0.08	3.42	10.33	5289.76	0.00	10.33
24/04/1971	0.8	2.5	0	2.5	0.00	0.00	0.00	0.81	13.37	0.89	1.61	3.42	15.37	7896.40	0.00	15.37
25/04/1971	2	8.4	0	8.4	0.00	17.68	0.00	0.71	13.41	1.03	7.37	3.42	28.17	13397.78	0.00	28.17
26/04/1971	5.3	0.5	0	0.5	0.00	26.73	0.00	0.87	13.44	1.25	0.00	3.42	29.59	15151.20	0.00	29.59
27/04/1971	5.3	2.8	0	2.8	0.00	26.73	0.00	0.87	13.48	1.26	1.54	3.42	34.58	17994.45	0.00	34.58
28/04/1971	5.3	3.8	0	3.8	0.00	26.73	0.00	0.87	13.51	1.26	2.34	3.42	40.52	20548.87	0.00	40.52
29/04/1971	3.1	0.3	0	0.3	0.00	20.70	0.00	0.76	13.55	1.11	0.00	3.42	43.75	22399.10	0.00	43.75
30/04/1971	6	2	0	2	0.00	25.81	0.00	0.87	13.58	1.27	0.73	3.42	47.80	24527.17	0.00	47.80
01/05/1971	3.9	3	0	3	0.00	22.89	0.00	0.76	13.61	1.11	1.89	3.42	53.22	27246.42	0.00	53.22
02/05/1971	3.8	0	0	0	0.00	22.07	0.00	0.76	13.65	1.11	0.00	3.42	56.64	28091.85	0.00	56.64
03/05/1971	7.3	0	0	0	0.00	32.22	0.00	1.00	13.68	1.48	0.00	3.42	60.07	30735.27	0.00	60.07
04/05/1971	7.5	0	0	0	0.00	31.56	0.00	1.00	13.74	1.46	0.00	3.42	63.49	32489.69	0.00	63.49
05/05/1971	7.2	0	0	0	0.00	31.84	0.00	1.00	13.78	1.46	0.00	3.42	66.91	34244.11	0.00	66.91
06/05/1971	10.8	0	0	0	0.00	41.82	0.00	1.23	13.78	1.78	0.00	3.42	49.81	20895.84	0.00	30.97
07/05/1971	10.3	5.1	0	5.1	0.00	40.45	0.00	1.23	13.82	1.78	3.32	3.42	37.71	10307.05	0.00	37.71
08/05/1971	8.5	11.9	0	11.9	0.00	35.78	0.00	1.07	13.85	1.57	10.33	3.42	31.48	20348.66	0.00	31.48
09/05/1971	8.4	0	0	0	0.00	26.75	0.00	0.84	13.89	1.38	0.00	3.42	54.89	28101.86	0.00	54.89
10/05/1971	7.5	0	0	0	0.00	32.77	0.00	1.00	13.92	1.49	0.00	3.42	58.31	29855.41	0.00	58.31
11/05/1971	12.8	4.8	0	4.8	0.00	47.30	0.00	1.49	13.95	2.86	0.00	3.42	64.45	32791.80	0.00	64.45
12/05/1971	7.2	0.5	0	0.5	0.00	31.84	0.00	1.00	13.99	1.49	0.00	3.42	57.88	29533.39	0.00	57.88
13/05/1971	4.5	0	0	0	0.00	24.84	0.00	0.81	14.02	1.22	0.00	3.42	61.30	31385.81	0.00	61.30
14/05/1971	6.4	0	0	0	0.00	26.75	0.00	0.84	14.06	1.40	0.00	3.42	64.72	33140.24	0.00	64.72
15/05/1971	9.5	0	0	0	0.00	38.25	0.00	1.15	14.09	1.71	0.00	3.42	68.11	34955.00	0.00	68.11
16/05/1971	12.8	0	0	0	0.00	48.46	0.00	1.40	14.12	2.07	0.00	3.42	51.89	26567.08	0.00	47.05
17/05/1971	9.5	0	0	0	0.00	38.25	0.00	1.15	14.16	1.71	0.00	3.42	45.47	23280.51	0.00	35.89
18/05/1971	12.4	0	0	0	0.00	48.95	0.00	1.50	14.19	2.21	0.00	3.42	39.05	19991.93	0.00	34.84
19/05/1971	15.8	3.8	0	3.8	0.00	55.53	0.00	1.71	14.23	2.50	1.30	3.42	33.93	17372.25	0.00	33.93
20/05/1971	8.8	0	0	0	0.00	35.78	0.00	1.07	14.26	1.82	0.00	3.42	37.35	19125.88	0.00	37.35
21/05/1971	10.8	0	0	0	0.00	41.27	0.00	1.23	14.29	1.84	0.00	3.42	40.78	20876.10	0.00	39.94
22/05/1971	11.7	0	0	0	0.00	44.29	0.00	1.31	14.33	1.97	0.00	3.42	34.36	17692.53	0.00	24.62
23/05/1971	11.1	0	0	0	0.00	42.84	0.00	1.31	14.36	1.87	0.00	3.42	27.84	14505.95	0.00	18.10
24/05/1971	14.2	20.3	0	20.3	0.00	51.15	0.00	1.80	14.40	2.39	17.81	3.42	39.44	20181.24	0.00	39.44
25/05/1971	10.8	1	0	1	0.00	41.27	0.00	1.23	14.43	1.86	0.00	3.42	42.86	21944.67	0.00	42.86
26/05/1971	8.4	0	0	0	0.00	26.75	0.00	0.84	14.46	1.44	0.00	3.42	46.28	23698.09	0.00	46.28
27/05/1971	9.5	0	0	0	0.00	38.25	0.00	1.15	14.50	1.75	0.00	3.42	49.71	25451.51	0.00	49.71
28/05/1971	9.2	0	0	0	0.00	37.43	0.00	1.15	14.53	1.78	0.00	3.42	43.29	22184.84	0.00	33.45
29/05/1971	13.4	0	0	0	0.00	48.95	0.00	1.50	14.57	2.27	0.00	3.42	36.87	18876.36	0.00	27.03
30/05/1971	14.5	0	0	0	0.00	51.97	0.00	1.50	14.60	2.42	0.00	3.42	30.45	15581.79	0.00	20.61
31/05/1971	13.9	0	0	0	0.00	50.32	0.00	1.50	14.63	2.27	0.00	3.42	24.03	12305.21	0.00	14.19
01/06/1971	14.5	1	0	1	0.00	51.97	0.00	1.50	14.67	2.49	0.00	3.42	17.61	9018.84	0.00	17.61
02/06/1971	15	24.1	0	24.1	0.00	53.34	0.00	1.71	14.70	2.59	21.81	3.42	42.55	21783.89	0.00	42.55
03/06/1971	13.7	0	0	0	0.00	49.77	0.00	1.50	14.74	2.29	0.00	3.42	45.97	23337.39	0.00	45.97
04/06/1971	19.2	0	0	0	0.00	59.63	0.00	1.82	14.77	2.77	0.00	3.42	49.40	25290.81	0.00	49.40
05/06/1971	12.8	0	0	0	0.00	41.82	0.00	1.24	14.81	1.94	0.00	3.42	33.15	16854.29	0.00	13.45
06/06/1971	19.2	0	0	0	0.00	64.86	0.00	2.20	14.84	3.32	0.00	3.42	16.67	8937.64	0.00	9.89
07/06/1971	17.8	5.3	0	5.3	0.00	61.02	0.00	1.84	14.87	2.95	2.35	3.42	5.77	2955.72	0.00	5.77
08/06/1971	15.3	1	0	1	0.00	54.16	0.00	1.71	14.91	2.63	0.00	3.42	9.20	4709.14	0.00	9.20
09/06/1971	14.2	0	0	0	0.00	51.15	0.00	1.60	14.94	2.48	0.00	3.42	12.62	6462.57	0.00	12.62
10/06/1971	11.1	0	0	0	0.00	33.34	0.00	1.71	14.98	2.84	0.00	3.42	16.05	8215.99	0.00	16

**Running Daily Water Balance, Resb Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate Ic 6136806
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
19.89 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.82 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
2806/1971	25.8	0	0	0	0.00	82.97	0.00	3.17	15.11	4.77	0.00	3.42	3.42	1753.42	19.89	0.00
2906/1971	25.8	0	0	0	0.00	82.42	0.00	3.17	15.07	4.78	0.00	3.42	3.42	1753.42	19.89	0.00
3006/1971	25.8	0	0	0	0.00	82.42	0.00	3.17	15.04	4.75	0.00	3.42	3.42	1753.42	19.89	0.00
0107/1971	25.9	0	0	0	0.00	82.97	0.00	3.17	15.01	4.74	0.00	3.42	3.42	1753.42	19.89	0.00
0207/1971	19.2	0	0	0	0.00	84.06	0.00	2.99	14.87	3.33	0.00	3.42	3.42	1753.42	19.89	0.00
0307/1971	18.9	0	0	0	0.00	84.04	0.00	2.99	14.84	3.16	0.00	3.42	3.42	1753.42	19.89	0.00
0407/1971	21.4	0	0	0	0.00	79.00	0.00	2.49	14.80	3.78	0.00	3.42	3.42	1753.42	19.89	0.00
0507/1971	24.5	6.8	0	6.8	0.00	79.40	0.00	2.99	14.87	4.44	2.18	3.42	5.68	2858.02	0.00	5.58
0607/1971	22.8	0	0	0	0.00	74.74	0.00	2.84	14.83	3.95	0.00	3.42	9.01	4911.44	0.00	9.01
0707/1971	24.5	0	0	0	0.00	73.81	0.00	2.84	14.80	3.94	0.00	3.42	12.43	6364.87	19.89	0.00
0807/1971	24.2	0	0	0	0.00	78.58	0.00	3.09	14.75	4.42	0.00	3.42	3.42	1753.42	19.89	0.00
0907/1971	24.5	0	0	0	0.00	79.40	0.00	2.99	14.73	4.40	0.00	3.42	3.42	1753.42	19.89	0.00
1007/1971	21.4	0	0	0	0.00	79.00	0.00	2.49	14.70	3.70	0.00	3.42	3.42	1753.42	19.89	0.00
1107/1971	21.7	0	0	0	0.00	71.72	0.00	2.49	14.68	3.68	0.00	3.42	3.42	1753.42	19.89	0.00
1207/1971	20	0	0	0	0.00	87.06	0.00	2.34	14.63	3.48	0.00	3.42	3.42	1753.42	19.89	0.00
1307/1971	21.4	0	0	0	0.00	79.80	0.00	2.49	14.69	3.67	0.00	3.42	3.42	1753.42	19.89	0.00
1407/1971	20	0	0	0	0.00	87.06	0.00	2.34	14.69	3.48	0.00	3.42	6.83	3508.85	0.00	6.83
1507/1971	19.2	1.3	0	1.3	0.00	84.86	0.00	2.20	14.62	3.26	0.00	3.42	10.27	5289.77	0.00	10.27
1607/1971	21.4	3	0	3	0.00	79.80	0.00	2.49	14.49	3.68	0.00	3.42	13.70	7013.70	0.00	13.70
1707/1971	18.5	6.1	0	6.1	0.00	83.22	0.00	2.06	14.45	3.05	3.05	3.42	20.18	10330.31	0.00	20.18
1807/1971	18.3	0	0	0	0.00	82.89	0.00	2.06	14.42	3.04	0.00	3.42	23.60	12083.74	0.00	23.60
1907/1971	17.8	7.8	0	7.8	0.00	81.02	0.00	1.84	14.39	2.86	4.73	3.42	31.77	16286.55	0.00	31.77
2007/1971	18.7	0	0	0	0.00	89.00	0.00	1.82	14.35	2.88	0.00	3.42	35.20	18016.97	0.00	35.20
2107/1971	18.6	0	0	0	0.00	83.22	0.00	2.06	14.32	3.05	0.00	3.42	38.62	19773.40	19.89	18.92
2207/1971	23.3	0	0	0	0.00	75.11	0.00	2.81	14.28	4.03	0.00	3.42	22.38	11448.82	19.89	2.87
2307/1971	25	7.4	0	7.4	0.00	80.77	0.00	3.17	14.26	4.51	2.89	3.42	8.98	4560.68	0.00	8.98
2407/1971	20	22.1	0	22.1	0.00	87.06	0.00	2.34	14.21	3.38	18.72	3.42	31.13	15928.80	0.00	31.13
2507/1971	19.5	0	0	0	0.00	85.68	0.00	2.20	14.18	3.17	0.00	3.42	34.65	17992.03	0.00	34.65
2607/1971	23.7	0	0	0	0.00	77.21	0.00	2.81	14.15	3.99	0.00	3.42	37.95	19445.45	19.89	18.29
2707/1971	17.5	0	0	0	0.00	90.20	0.00	1.84	14.11	2.80	0.00	3.42	21.77	11118.88	19.89	19.89
2807/1971	21.7	0.5	0	0.5	0.00	71.72	0.00	2.49	14.08	3.54	0.00	3.42	5.45	2782.99	0.00	5.45
2907/1971	20	0	0	0	0.00	87.06	0.00	2.34	14.04	3.34	0.00	3.42	8.88	4545.73	0.00	8.88
3007/1971	19.2	0	0	0	0.00	84.86	0.00	2.20	14.01	3.14	0.00	3.42	12.30	6289.15	19.89	0.00
3107/1971	20.3	0	0	0	0.00	87.88	0.00	2.34	13.97	3.32	0.00	3.42	3.42	1753.42	19.89	0.00
0108/1971	21.4	0	0	0	0.00	79.80	0.00	2.49	13.94	3.51	0.00	3.42	3.42	1753.42	19.89	0.00
0208/1971	22	0	0	0	0.00	72.54	0.00	2.64	13.89	3.71	0.00	3.42	3.42	1753.42	19.89	0.00
0308/1971	22.8	0	0	0	0.00	74.74	0.00	2.64	13.87	3.69	0.00	3.42	3.42	1753.42	19.89	0.00
0408/1971	18.1	0	0	0	0.00	81.84	0.00	2.06	13.84	2.92	0.00	3.42	3.42	1753.42	19.89	0.00
0508/1971	18.5	0	0	0	0.00	83.22	0.00	2.06	13.80	2.81	0.00	3.42	3.42	1753.42	19.89	0.00
0608/1971	19.4	0	0	0	0.00	85.41	0.00	2.20	13.77	3.08	0.00	3.42	3.42	1753.42	19.89	0.00
0708/1971	20.8	0	0	0	0.00	88.70	0.00	2.34	13.73	3.28	0.00	3.42	3.42	1753.42	19.89	0.00
0808/1971	22.3	0	0	0	0.00	79.80	0.00	2.49	13.70	3.65	0.00	3.42	3.42	1753.42	19.89	0.00
0908/1971	23.8	0	0	0	0.00	72.76	0.00	2.81	13.68	3.85	0.00	3.42	3.42	1753.42	19.89	0.00
1008/1971	25	5.1	0	5.1	0.00	80.77	0.00	3.17	13.63	4.31	0.79	3.42	4.21	2155.98	0.00	4.21
1108/1971	22.8	0	0	0	0.00	74.74	0.00	2.64	13.59	3.62	0.00	3.42	7.63	3909.11	0.00	7.63
1208/1971	19.1	0	0	0	0.00	89.26	0.00	1.82	13.56	2.64	0.00	3.42	11.08	6882.53	19.89	0.00
1308/1971	19.5	0	0	0	0.00	85.68	0.00	2.20	13.53	3.03	0.00	3.42	3.42	1753.42	19.89	0.00
1408/1971	22.8	0	0	0	0.00	74.74	0.00	2.64	13.49	3.59	0.00	3.42	3.42	1753.42	19.89	0.00
1508/1971	18.4	0	0	0	0.00	83.22	0.00	2.06	13.46	2.84	0.00	3.42	3.42	1753.42	19.89	0.00
1608/1971	18.1	0	0	0	0.00	81.84	0.00	2.06	13.42	2.83	0.00	3.42	3.42	1753.42	19.89	0.00
1708/1971	18.9	0	0	0	0.00	84.04	0.00	2.09	13.39	2.82	0.00	3.42	3.42	1753.42	19.89	0.00
1808/1971	21.7	0	0	0	0.00	71.72	0.00	2.49	13.35	3.38	0.00	3.42	3.42	1753.42	19.89	0.00
1908/1971	23.1	5.8	0	5.8	0.00	75.89	0.00	2.81	13.32	3.78	1.84	3.42	5.28	2893.40	0.00	5.28
2008/1971	22.4	0	0	0	0.00	75.28	0.00	2.81	13.28	3.75	0.00	3.42	8.69	4448.83	0.00	8.69
2108/1971	24.2	0	0	0	0.00	78.88	0.00	2.89	13.25	3.95	0.00	3.42	12.11	6205.28	19.89	0.00
2208/1971	21.7	29	0	29	0.00	71.72	0.00	2.49	13.22	3.32	23.89	3.42	26.10	14900.82	0.00	26.10
2308/1971	15	0	0	0	0.00	53.34	0.00	1.71	13.18	2.32	0.00	3.42	32.53	16654.34	0.00	32.53
2408/1971	12	3.8	0	3.8	0.00	45.11	0.00	1.49	13.15	1.83	1.67	3.42	37.63	19264.62	0.00	37.63
2508/1971	19.5	8.8	0	8.8	0.00	85.88	0.00	2.20	13.11	2.83	5.67	3.42	46.72	23919.49	0.00	46.72
2608/1971	18.9	28.4	0	28.4	0.00	84.04	0.00	2.06	13.08	2.78	22.85	3.42	72.79	37207.73	0.00	72.79
2708/1971	21.4	21.3	0	21.3	0.00	79.80	0.00	2.49	13.04	3.28	18.02	3.42	84.23	48248.08	0.00	84.23
2808/1971	19.2	6.1	0	6.1	0.00	83.69	0.00	2.20	13.01	2.81	3.18	3.42	100.84	51851.83	0.00	100.84
2908/1971	18.9	0	0	0	0.00	84.04	0.00	2.06	12.97	2.73	0.00	3.42	104.27	53385.35	0.00	104.27
3008/1971	22.2	1.3	0	1.3	0.00	73.09	0.00	2.64	12.94	3.45	0.00	3.42	107.69	55138.78	0.00	107.69
3108/1971	17.8	0	0	0	0.00	81.02	0.00	1.84	12.91	2.56	0.00	3.42	111.12	56892.20	0.00	111.12
0109/1971	18.6	0	0	0	0.00	83.22	0.00	2.06	12.87	2.71	0.00	3.42	114.84	58845.83	9.84	104.70
0209/1971	21.4	0	0	0	0.00	79.80	0.00	2.49	12.84	3.23	0.00	3.42	108.12	61552.05	9.84	88.28
0309/1971	23.8	0	0	0	0.00	77.75	0.00	2.81	12.80	3.81	0.00	3.42	101.70	52072.48	9.84	81.86
0409/1971	23.6	0	0	0	0.00	79.80	0.00	2.81	12.77	3.80	0.00	3.42	95.28	47783.80	9.84	85.44
0509/1971	24.2	0	0	0	0.00	78.58	0.00	2.99	12.73	3.81	0.00	3.42	88.87	45459.32	9.84	78.02
0609/1971	25.9	12.7	0	12.7	0.00	83.24	0.00	3.17	12.70	4.91	8.69	3.42	81.14	49853.04	0.00	81.14
0709/1971	23.9	0.3	0	0.3	0.00	77.75	0.00	2.81	12.68	3.87	0.00	3.42	84.56	48418.47	0.00	84.56
0809/1971	24.5	0	0	0	0.00	79.40	0.00</									

**Running Daily Water Balance, Resb Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate k 8136606
WMO Identifier
TC Identifier

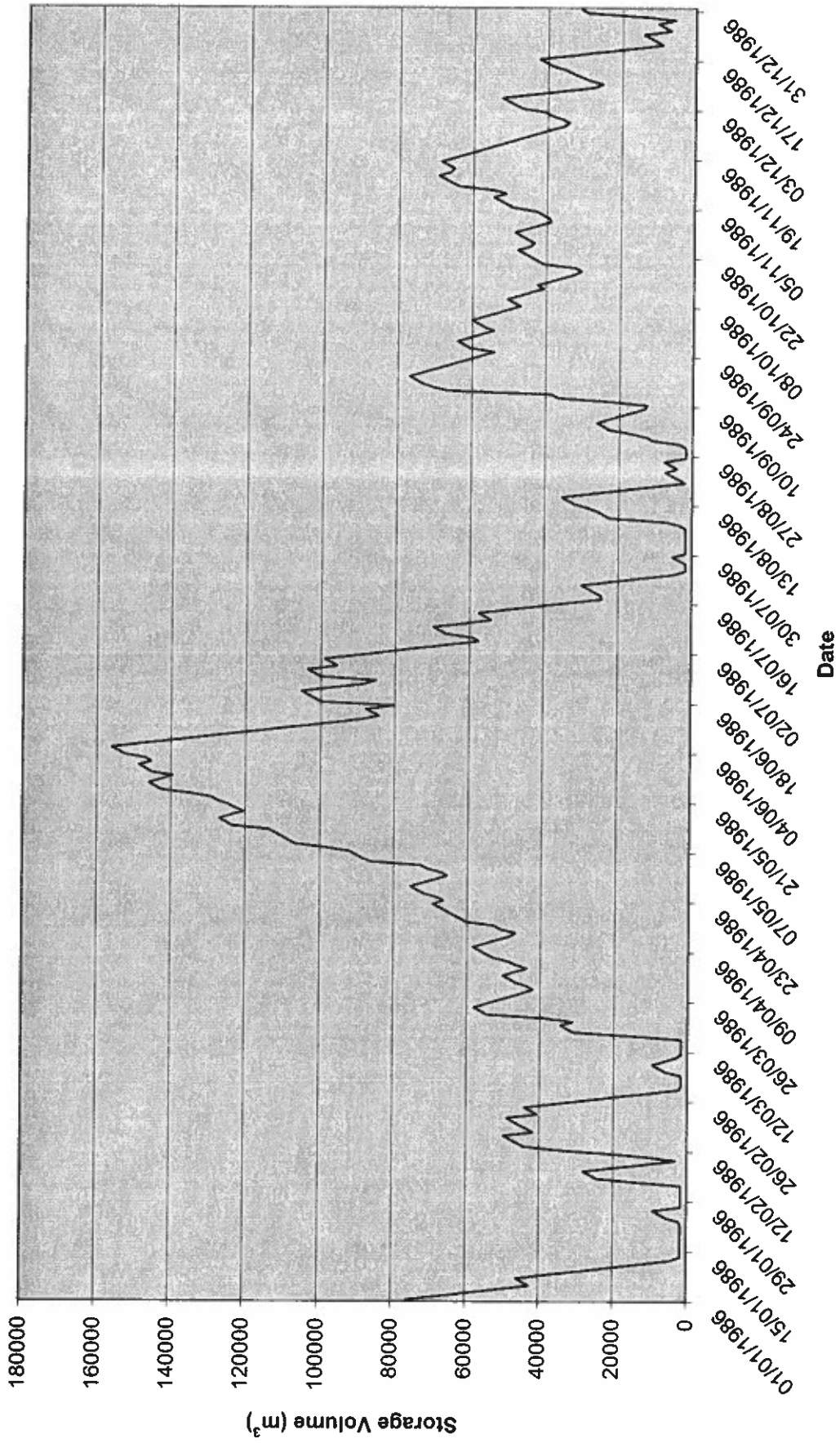
Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
23/06/1971	11.7	2.5	0	2.5	0.0	44.20	0.00	1.31	12.06	1.85	0.85	3.42	83.22	42610.35	0.00	83.22
26/06/1971	12.9	0	0	0	0.00	47.20	0.00	1.40	12.03	1.76	0.00	3.42	86.65	44363.78	0.00	86.65
27/06/1971	15.3	0	0	0	0.00	54.16	0.00	1.71	12.00	2.11	0.00	3.42	90.07	46117.20	0.00	90.07
28/06/1971	20	0	0	0	0.00	67.09	0.00	2.34	11.87	2.84	0.00	3.42	93.85	47980.63	0.00	93.85
29/06/1971	22.8	0	0	0	0.00	73.37	0.00	2.84	11.84	3.18	0.00	3.42	77.22	39244.05	0.00	87.29
30/06/1971	17.6	0	0	0	0.00	60.20	0.00	1.84	11.61	2.37	0.00	3.42	70.82	36257.48	0.00	80.07
01/07/1971	19.4	0	0	0	0.00	65.41	0.00	2.20	11.87	2.59	0.00	3.42	84.40	32670.60	0.00	84.40
02/07/1971	20	0	0	0	0.00	67.09	0.00	2.34	11.84	2.81	0.00	3.42	67.06	20884.33	0.00	48.13
03/07/1971	22.8	5.1	0	5.1	0.00	73.81	0.00	2.84	11.81	3.15	1.95	3.42	53.81	17397.38	0.00	53.81
04/07/1971	19.9	3.6	0	3.6	0.00	64.04	0.00	2.08	11.78	2.48	1.12	3.42	59.05	20773.78	0.00	59.05
05/07/1971	16.4	5.1	0	5.1	0.00	57.19	0.00	1.82	11.75	2.20	2.90	3.42	64.38	32862.67	0.00	64.38
06/07/1971	15.3	2.5	0	2.5	0.00	54.16	0.00	1.71	11.72	2.08	0.44	3.42	58.24	34039.38	0.00	58.24
07/07/1971	9.6	0	0	0	0.00	35.78	0.00	1.07	11.69	1.33	0.00	3.42	71.87	36982.78	0.00	71.87
08/07/1971	10	2.5	0	2.5	0.00	39.82	0.00	1.23	11.88	1.51	0.99	3.42	78.08	38924.65	0.00	78.08
09/07/1971	14.2	17.9	0	17.9	0.00	51.15	0.00	1.80	11.63	1.93	16.67	3.42	95.38	48635.21	0.00	95.38
10/07/1971	10.9	0	0	0	0.00	42.09	0.00	1.73	11.60	1.49	0.00	3.42	98.81	50588.84	0.00	98.81
11/07/1971	12	2.5	0	2.5	0.00	45.11	0.00	1.49	11.87	1.66	0.81	3.42	103.04	52754.23	0.00	103.04
12/07/1971	9.7	0	0	0	0.00	38.80	0.00	1.15	11.84	1.39	0.00	3.42	108.46	54987.66	0.00	108.46
13/07/1971	13.8	0	0	0	0.00	49.50	0.00	1.50	11.50	1.79	0.00	3.42	109.88	56201.08	0.00	109.88
14/07/1971	15	0	0	0	0.00	53.34	0.00	1.71	11.47	2.02	0.00	3.42	103.47	52674.50	0.00	63.82
15/07/1971	18.9	0	0	0	0.00	68.55	0.00	1.82	11.44	2.14	0.00	3.42	97.05	49887.93	0.00	87.20
16/07/1971	19.4	0	0	0	0.00	67.16	0.00	1.82	11.41	2.13	0.00	3.42	90.63	46401.32	0.00	80.78
17/07/1971	14.7	0	0	0	0.00	62.52	0.00	1.60	11.38	1.88	0.00	3.42	84.21	43114.78	0.00	74.36
18/07/1971	14.7	0	0	0	0.00	62.52	0.00	1.60	11.35	1.88	0.00	3.42	77.78	39888.20	0.00	67.95
19/07/1971	18.6	0	0	0	0.00	51.87	0.00	1.60	11.32	1.87	0.00	3.42	71.37	36541.63	0.00	61.53
20/07/1971	17.5	0	0	0	0.00	60.20	0.00	1.84	11.29	2.24	0.00	3.42	64.85	33355.05	0.00	55.11
21/07/1971	17.2	0	0	0	0.00	59.38	0.00	1.84	11.28	2.24	0.00	3.42	58.63	29888.48	0.00	48.69
22/07/1971	14.7	5.8	0	5.8	0.00	52.52	0.00	1.80	11.23	1.80	3.84	3.42	50.68	28700.43	0.00	50.68
23/07/1971	15.3	0	0	0	0.00	54.16	0.00	1.71	11.20	1.97	0.00	3.42	59.49	30453.85	0.00	59.49
24/07/1971	12.3	12.4	0	12.4	0.00	45.83	0.00	1.40	11.19	1.63	10.77	3.42	73.87	37718.27	0.00	73.87
25/07/1971	13.4	1.3	0	1.3	0.00	48.86	0.00	1.50	11.19	1.83	0.00	3.42	77.10	39417.64	0.00	77.10
26/07/1971	13.9	0	0	0	0.00	50.32	0.00	1.50	11.10	1.73	0.00	3.42	80.82	41228.07	0.00	80.82
27/07/1971	16.7	0	0	0	0.00	58.09	0.00	1.82	11.07	2.07	0.00	3.42	83.84	42676.49	0.00	83.84
28/07/1971	18.4	0	0	0	0.00	62.87	0.00	2.08	11.04	2.33	0.00	3.42	77.53	39992.92	0.00	67.88
29/07/1971	14.2	0	0	0	0.00	51.15	0.00	1.80	11.01	1.83	0.00	3.42	71.11	36409.34	0.00	61.29
30/07/1971	15.8	0	0	0	0.00	54.99	0.00	1.71	10.98	1.89	0.00	3.42	64.99	33116.77	0.00	54.84
31/07/1971	15.9	0	0	0	0.00	53.11	0.00	1.71	10.95	1.92	0.00	3.42	58.27	29531.19	0.00	48.84
01/08/1971	13.4	0	0	0	0.00	48.85	0.00	1.50	10.92	1.70	0.00	3.42	51.85	29546.62	0.00	42.01
02/08/1971	13.8	0	0	0	0.00	49.50	0.00	1.50	10.89	1.69	0.00	3.42	45.43	23280.04	0.00	35.68
03/08/1971	9.2	0	0	0	0.00	37.43	0.00	1.15	10.86	1.32	0.00	3.42	38.01	19973.46	0.00	28.17
04/08/1971	4.6	0	0	0	0.00	24.54	0.00	0.81	10.83	0.94	0.00	3.42	32.59	16848.89	0.00	22.75
05/08/1971	7	0	0	0	0.00	31.39	0.00	1.09	10.79	1.16	0.00	3.42	26.17	13493.31	0.00	15.33
06/08/1971	6.3	5.3	0	5.3	0.00	34.99	0.00	1.07	10.76	1.22	4.08	3.42	20.63	12421.34	0.00	20.63
07/08/1971	-0.9	0	0	0	0.00	48.86	0.00	0.98	10.73	0.88	0.00	3.42	27.10	13954.78	0.00	27.28
08/08/1971	-1.2	0	0	0	0.00	0.00	0.00	0.58	10.70	0.88	0.00	3.42	30.68	15708.19	0.00	20.84
09/08/1971	0.6	5.1	0	5.1	0.00	0.00	0.00	0.81	10.67	0.71	4.39	3.42	28.65	14889.70	0.00	28.65
10/08/1971	4.2	1	0	1	0.00	20.71	0.00	0.81	10.64	0.83	0.07	3.42	32.15	16456.32	0.00	32.15
11/08/1971	3.1	0	0	0	0.00	20.79	0.00	0.78	10.61	0.87	0.00	3.42	35.67	18212.75	0.00	35.67
12/08/1971	6.9	0	0	0	0.00	27.85	0.00	0.87	10.58	0.89	0.00	3.42	39.00	19989.17	0.00	39.16
13/08/1971	7	0	0	0	0.00	31.98	0.00	0.99	10.55	1.12	0.00	3.42	33.88	16879.60	0.00	27.73
14/08/1971	5.3	1.8	0	1.8	0.00	20.73	0.00	0.87	10.52	0.96	0.82	3.42	28.89	13812.24	0.00	28.98
15/08/1971	8.6	0	0	0	0.00	38.28	0.00	1.15	10.49	1.27	0.00	3.42	30.40	15565.87	0.00	30.40
16/08/1971	8.6	0	0	0	0.00	35.78	0.00	1.07	10.46	1.19	0.00	3.42	33.83	17318.09	0.00	33.83
17/08/1971	9.7	0	0	0	0.00	38.80	0.00	1.15	10.42	1.26	0.00	3.42	27.41	14032.51	0.00	17.56
18/08/1971	13.1	3.8	0	3.8	0.00	48.13	0.00	1.59	10.39	1.82	2.16	3.42	33.17	11862.24	0.00	29.17
19/08/1971	9.2	15	1.5	16.5	1.50	37.43	1.50	1.15	10.36	1.28	15.24	3.42	41.84	21430.82	0.00	41.84
20/08/1971	3.7	18.3	1.5	19.8	1.50	22.34	1.50	0.78	10.33	0.84	18.86	3.42	64.22	32880.41	0.00	64.22
21/08/1971	1.4	1.5	0.5	2	0.50	16.09	0.50	0.88	10.30	0.73	1.27	3.42	68.91	35281.79	0.00	68.91
22/08/1971	-2.6	0	0	0	0.00	0.00	0.00	0.55	10.27	0.63	0.00	3.42	72.33	37035.22	0.00	72.33
23/08/1971	-4.2	0	0	0	0.00	0.00	0.00	0.50	10.24	0.56	0.00	3.42	75.78	38788.04	0.00	75.78
24/08/1971	-0.8	0	4.1	4.1	0.00	0.00	0.00	0.58	10.21	0.65	0.00	3.42	69.34	35562.07	0.00	69.34
25/08/1971	0.8	0	0	0	0.00	0.00	0.00	0.81	10.18	0.68	0.00	3.42	82.82	33215.89	0.00	82.82
26/08/1971	2.6	1.3	0	1.3	0.00	18.05	4.10	0.71	10.15	0.77	4.65	3.42	81.13	31287.27	0.00	81.13
27/08/1971	3.9	5.8	0	5.8	0.00	22.89	0.00	0.78	10.12	0.82	4.98	3.42	86.53	33588.09	0.00	86.53
28/08/1971	3.1	0	0	0	0.00	20.70	0.00	0.78	10.09	0.82	0.00	3.42	72.95	37351.61	0.00	72.95
29/08/1971	1.7	6.1	1	6.1	0.00	16.80	1.00	0.69	10.05	0.72	8.38	3.42	84.78	43397.51	0.00	84.78
30/08/1971	-2.6	0	0	0	0.00	0.00	0.00	0.55	10.02	0.61	0.00	3.42	88.19	45180.94	0.00	88.19
01/09/1971	-5.8	0	0.3	0.30	0.00	0.00	0.00	0.47	9.99	0.52	0.00	3.42	91.81	46954.39	0.00	91.81
02/09/1971	-4.7	4.8	0	4.8	0.00	25.89	0.00	0.50	9.96	0.55	0.00	3.42	78.35	38917.71	0.00	83.89
03/09/1971	-1.7	0	0	0	0.00	0.00	0.00	0.58	9.93	0.63	0.00	3.42	59.06	30251.21	0.00	39.40
04/09/1971	-0.3	0	0	0	0.00	0.00	0.00	0.58	9.90	0.63	0.00	3.42	42.82	21924.69	0.00	23.13
05/09/1971	-0.3	2.3	0	2.3	0.00	0.00	0.00	0.58	9.							

Storage Volumes - Phase 2 Scenario (Regular Groundwater Inflow)
1984 - Average Year from Recorded Data



**Running Daily Water Balance, Reeb Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate Ic 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/a 0.0625 m³/a
19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/01/1964	-3.3	0	0	0	50.00	0.00	0.00	0.52	9.07	0.83	0.00	3.42	147.91	75727.40	19.69	128.22
02/01/1964	-1.8	0	0	0	50.00	0.00	0.00	0.58	9.11	0.94	0.00	3.42	131.84	67400.82	19.69	111.95
03/01/1964	0.3	0	0	0	50.00	0.00	0.00	0.61	9.15	0.81	0.00	3.42	115.38	59074.25	19.69	95.99
04/01/1964	0.3	0	0	0	50.00	0.00	0.00	0.61	9.19	0.61	0.00	3.42	99.12	50747.87	19.69	79.42
05/01/1964	0.8	0.8	0	0.8	50.00	0.00	0.00	0.61	9.23	0.81	0.19	3.42	83.94	42519.98	0.00	63.94
06/01/1964	1	0	0	0	50.00	0.00	0.00	0.59	9.27	0.89	0.00	3.42	69.47	34278.30	0.00	48.97
07/01/1964	-3.3	0	1	1	51.00	0.00	0.00	0.38	9.31	0.40	0.00	3.42	52.89	26023.83	19.69	33.20
08/01/1964	-7.8	0	0	0	51.00	0.00	0.00	0.41	9.35	0.43	0.00	3.42	37.83	17897.26	19.69	13.54
09/01/1964	-7.6	0	0	0	50.00	0.00	0.00	0.41	9.39	0.43	0.00	3.42	23.36	9270.67	19.69	37.68
10/01/1964	-8	0	2.4	2.4	63.00	0.00	0.00	0.47	9.43	0.49	0.00	3.42	11.10	21044.10	19.69	21.41
11/01/1964	-19.8	0	0	0	63.00	0.00	0.00	0.23	9.47	0.29	0.00	3.42	24.84	12712.52	19.69	3.15
12/01/1964	-19.8	0	0	0	63.00	0.00	0.00	0.22	9.51	0.24	0.00	3.42	9.58	4390.95	19.69	0.00
13/01/1964	-9	0	10	10	73.00	0.00	0.00	0.47	9.55	0.50	0.00	3.42	3.42	1753.42	19.69	0.00
14/01/1964	-5	0	2	2	75.00	0.00	0.00	0.50	9.59	0.53	0.00	3.42	3.42	1753.42	19.69	0.00
15/01/1964	-13.3	0	0	0	75.00	0.00	0.00	0.23	9.63	0.26	0.00	3.42	3.42	1753.42	19.69	0.00
16/01/1964	-14.5	0	0	0	75.00	0.00	0.00	0.22	9.67	0.25	0.00	3.42	3.42	1753.42	19.69	0.00
17/01/1964	-8.5	0	0.6	0.6	75.00	0.00	0.00	0.39	9.70	0.42	0.00	3.42	3.42	1753.42	19.69	0.00
18/01/1964	-9	0	0.8	0.8	75.00	0.00	0.00	0.47	9.74	0.51	0.00	3.42	3.42	1753.42	19.69	0.00
19/01/1964	-14.5	0	2	2	78.20	0.00	0.00	0.25	9.78	0.25	0.00	3.42	3.42	1753.42	19.69	0.00
20/01/1964	-14.3	0	0	0	78.20	0.00	0.00	0.22	9.82	0.25	0.00	3.42	3.42	1753.42	19.69	0.00
21/01/1964	-17.8	0	0.4	0.4	78.90	0.00	0.00	0.18	9.86	0.21	0.00	3.42	3.42	1753.42	19.69	0.00
22/01/1964	-11.3	0	0	0	78.90	0.00	0.00	0.20	9.90	0.20	0.00	3.42	3.42	1753.42	19.69	0.00
23/01/1964	-9	1.0	0	1.0	78.90	0.00	0.00	0.47	9.94	0.52	1.00	3.42	4.51	2367.26	0.00	4.51
24/01/1964	0.3	3.8	0	3.8	78.90	0.00	0.00	0.81	9.99	0.99	3.14	3.42	11.07	6998.21	0.00	11.07
25/01/1964	1	0	0	0	78.90	0.00	0.00	0.89	10.02	0.72	0.00	3.42	4.92	7419.93	0.00	14.49
26/01/1964	0	0	3.4	3.4	82.90	0.00	0.00	0.81	10.05	0.67	0.00	3.42	17.02	9173.06	19.69	0.00
27/01/1964	-1	0	0	0	82.90	0.00	0.00	0.58	10.10	0.84	0.00	3.42	3.42	1753.42	19.69	0.00
28/01/1964	-8	0	2	2	84.00	0.00	0.00	0.41	10.14	0.47	0.00	3.42	3.42	1753.42	19.69	0.00
29/01/1964	-2.5	0	2.8	2.8	86.80	0.00	0.00	0.53	10.18	0.62	0.00	3.42	3.42	1753.42	19.69	0.00
30/01/1964	-2	0	5	5	81.80	0.00	0.00	0.88	10.22	0.85	0.00	3.42	3.42	1753.42	19.69	0.00
31/01/1964	-9.8	0	0	0	81.80	0.00	0.00	0.42	10.26	0.33	0.00	3.42	3.42	1753.42	19.69	0.00
01/02/1964	-12.8	0	0	0	81.80	0.00	0.00	0.39	10.30	0.28	0.00	3.42	3.42	1753.42	19.69	0.00
02/02/1964	-1.5	0.2	0	0.2	81.80	0.00	0.00	0.58	10.34	0.66	0.00	3.42	3.42	1753.42	19.69	0.00
03/02/1964	2.3	6.8	0	6.8	81.80	18.50	18.50	0.71	10.38	0.79	24.51	3.42	27.89	14301.78	0.00	27.89
04/02/1964	1.6	1	1.8	2.8	75.10	18.31	18.31	0.65	10.42	0.74	16.56	3.42	47.82	24535.92	0.00	47.82
05/02/1964	0.6	0	0.6	0.6	59.39	0.00	0.00	0.81	10.46	0.99	0.00	3.42	51.35	26299.35	0.00	51.35
06/02/1964	-7	0	0.2	0.2	59.39	0.00	0.00	0.44	10.50	0.52	0.00	3.42	54.77	28642.77	19.69	35.08
07/02/1964	-9.3	0	0	0	59.39	0.00	0.00	0.28	10.54	0.34	0.00	3.42	34.51	18718.20	19.69	18.82
08/02/1964	-7.5	0	0	0	59.39	0.00	0.00	0.41	10.58	0.49	0.00	3.42	22.25	11398.82	19.69	7.58
09/02/1964	-3.8	0	0	0	59.39	0.00	0.00	0.62	10.62	0.62	0.00	3.42	5.98	3083.05	19.69	0.00
10/02/1964	2.3	0	0	0	59.39	18.50	18.50	0.71	10.66	0.81	17.89	3.42	21.11	10806.25	0.00	21.11
11/02/1964	1.3	3.2	0	3.2	41.09	15.78	15.78	0.66	10.70	0.78	18.19	3.42	42.73	21878.44	0.00	42.73
12/02/1964	5.5	0	0	0	25.33	27.28	25.33	0.87	10.74	1.00	24.33	3.42	70.49	36989.27	0.00	70.49
13/02/1964	7.3	1.4	0	1.4	0.00	34.22	0.00	1.00	10.78	1.15	12.85	3.42	89.19	44423.98	0.00	89.19
14/02/1964	4.5	1	0	1	0.00	24.84	0.00	0.81	10.82	0.94	0.96	3.42	90.24	46205.11	0.00	90.24
15/02/1964	3	0	0	0	0.00	20.42	0.00	0.78	10.85	0.89	0.00	3.42	93.87	47958.54	0.00	93.87
16/02/1964	3.3	0	0	0	0.00	21.24	0.00	0.75	10.90	0.89	0.00	3.42	97.09	49711.06	19.69	77.41
17/02/1964	7.8	1.8	0	1.8	0.00	33.59	0.00	1.00	10.94	1.16	0.84	3.42	91.47	41711.72	0.00	91.47
18/02/1964	4	1	0	1	0.00	23.19	0.00	0.81	10.98	0.96	0.64	3.42	84.93	43485.78	0.00	84.93
19/02/1964	6.6	1.4	0	1.4	0.00	30.02	0.00	0.84	11.02	1.10	0.90	3.42	86.66	45393.86	0.00	86.66
20/02/1964	1	0	0.8	0.8	0.00	24.84	0.00	0.28	11.06	0.79	0.69	3.42	92.06	47147.31	0.00	92.06
21/02/1964	0.5	0	0	0	0.00	0.00	0.00	0.81	11.10	0.74	0.00	3.42	95.51	48900.73	19.69	75.82
22/02/1964	1.8	0	0	0	0.00	17.13	0.00	0.66	11.14	0.78	0.00	3.42	79.25	40574.18	0.00	79.25
23/02/1964	7.5	0	0	0	0.00	32.77	0.00	1.00	11.18	1.19	0.00	3.42	82.67	42327.58	0.00	82.67
24/02/1964	4.8	0	0	0	0.00	24.54	0.00	0.81	11.22	0.96	0.00	3.42	86.10	44081.01	19.69	66.41
25/02/1964	-1	0	2.6	2.6	2.00	0.00	0.00	0.58	11.26	0.72	0.00	3.42	69.83	39754.43	19.69	50.16
26/02/1964	-4	0	0	0	2.00	0.00	0.00	0.52	11.30	0.65	0.00	3.42	53.87	27427.85	19.69	33.86
27/02/1964	-5.3	0	32.4	32.4	38.00	0.00	0.00	0.47	11.34	0.59	0.00	3.42	37.31	19101.28	19.69	17.62
28/02/1964	-4.3	0	26	26	63.00	0.00	0.00	0.50	11.38	0.63	0.00	3.42	21.04	10774.70	19.69	1.38
29/02/1964	0	0	0	0	63.00	0.00	0.00	0.61	11.42	0.76	0.00	3.42	4.78	2449.13	19.69	0.00
01/03/1964	-6.8	0	0	0	63.00	0.00	0.00	0.44	11.46	0.50	0.00	3.42	3.42	1753.42	19.69	0.00
02/03/1964	-4.8	0	0	0	63.00	0.00	0.00	0.50	11.50	0.63	0.00	3.42	3.42	1753.42	19.69	0.00
03/03/1964	-5.5	0	0	0	63.00	0.00	0.00	0.47	11.54	0.60	0.00	3.42	3.42	1753.42	19.69	0.00
04/03/1964	-5.6	1	0	1	63.00	0.00	0.00	0.47	11.58	0.60	0.49	3.42	3.87	1957.94	0.00	3.87
05/03/1964	0.8	5.4	0	5.4	63.00	0.00	0.00	0.81	11.62	0.77	4.83	3.42	11.88	6060.20	0.00	11.88
06/03/1964	-0.5	0	0.8	0.8	63.00	0.00	0.00	0.58	11.66	0.74	0.90	3.42	15.30	7833.82	0.00	15.30
07/03/1964	-10.3	0	0	0	63.00	0.00	0.00	0.27	11.70	0.36	0.00	3.42	18.72	9587.04	0.00	8.88
08/03/1964	-13.3	0	0	0	63.00	0.00	0.00	0.23	11.74	0.32	0.00	3.42	12.31	6300.47	0.00	7.48
09/03/1964	-11.3	0	0.4	0.4	84.20	0.00	0.00	0.29	11.78	0.25	0.00	3.42	8.99	3913.89	19.69	0.00
10/03/1964	-7	0	7	7	71.20	0.00	0.00	0.44	11.82	0.68	0.00	3.42	3.42	1753.42	19.69	0.00
11/03/1964	-2.3	0	0	0	71.20	0.00	0.00	0.29	11.86	0.38	0.00	3.42	3.42	1753.42	19.69	0.00
12/03/1964	-1.3	0	12	12	83.20	0.00	0.00	0.25	11.90	0.34	0.00	3.42	3.42	1753.42	19.69	0.00
13/03/1964	-5.0	0	5</													

**Running Daily Water Balance, Reeb Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate k 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
27/06/1964	19.5	3.9	0	3.9	0.00	65.58	0.00	2.20	16.11	3.39	0.52	3.42	184.50	65465.63	0.00	184.50
28/06/1964	19.8	0	0	0.00	0.00	66.51	0.00	2.20	16.07	3.37	0.00	3.42	182.92	67229.09	0.00	182.92
29/06/1964	19	0.4	0	0.4	0.00	64.31	0.00	2.20	15.04	3.37	0.00	3.42	193.34	69997.48	19.69	173.65
30/06/1964	19	0	0	0.00	0.00	64.31	0.00	2.20	15.01	3.39	0.00	3.42	177.08	69065.91	19.69	157.39
01/07/1964	21	0	0	0.00	0.00	69.20	0.00	2.49	14.97	3.77	0.00	3.42	190.82	67339.39	19.69	141.13
02/07/1964	21.5	0	0	0.00	0.00	71.17	0.00	2.49	14.94	3.79	0.00	3.42	144.56	74912.78	19.69	124.87
03/07/1964	21.8	0	0	0.00	0.00	71.99	0.00	2.49	14.90	3.74	0.00	3.42	128.29	65665.18	19.69	108.61
04/07/1964	21.8	1.8	0	1.8	0.00	71.99	0.00	2.49	14.87	3.74	0.00	3.42	112.03	67359.61	0.00	112.03
05/07/1964	21.3	0	0	0.00	0.00	70.62	0.00	2.49	14.83	3.73	0.00	3.42	115.46	66113.03	0.00	115.46
06/07/1964	19.8	13.8	0	13.8	0.00	66.51	0.00	2.20	14.86	3.31	10.49	3.42	129.37	66239.94	0.00	129.37
07/07/1964	14.5	0	9	9	0.00	51.97	0.00	1.90	14.78	2.44	0.00	3.42	132.90	67992.36	0.00	132.90
08/07/1964	15	0	0	0.00	0.00	53.34	0.00	1.71	14.73	2.80	0.00	3.42	136.22	69745.70	19.69	116.53
09/07/1964	19.8	0	0	0.00	0.00	66.51	0.00	2.20	14.70	3.28	0.00	3.42	119.96	61419.21	19.69	100.27
10/07/1964	22	5.8	0	5.8	0.00	72.54	0.00	2.64	14.66	3.81	1.89	3.42	105.66	54058.84	0.00	105.66
11/07/1964	22.3	0	0	0.00	0.00	73.37	0.00	2.64	14.63	3.80	0.00	3.42	109.01	55812.06	0.00	109.01
12/07/1964	20.5	0	0	0.00	0.00	68.43	0.00	2.34	14.59	3.40	0.00	3.42	112.43	57565.49	19.69	92.75
13/07/1964	22	0	0	0.00	0.00	72.84	0.00	2.64	14.66	3.89	0.00	3.42	95.17	49233.91	19.69	75.48
14/07/1964	23.8	0	0	0.00	0.00	77.48	0.00	2.81	14.62	4.09	0.00	3.42	79.81	49813.24	19.69	60.12
15/07/1964	24.5	0	0	0.00	0.00	79.40	0.00	2.99	14.49	4.33	0.00	3.42	63.84	32583.70	19.69	43.96
16/07/1964	22.5	0	0	0.00	0.00	73.91	0.00	2.64	14.45	3.85	0.00	3.42	47.38	24259.18	19.69	27.69
17/07/1964	21.5	20.8	0	20.8	0.00	71.17	0.00	2.49	14.42	3.63	18.87	3.42	48.00	24823.02	0.00	48.00
18/07/1964	19.3	1.2	0	1.2	0.00	65.14	0.00	2.20	14.39	3.22	0.00	3.42	61.52	26379.44	0.00	61.52
19/07/1964	19.8	0	0	0.00	0.00	66.51	0.00	2.20	14.35	3.21	0.00	3.42	64.84	28129.87	0.00	64.84
20/07/1964	21.3	0	0	0.00	0.00	73.62	0.00	2.49	14.32	3.80	0.00	3.42	59.37	29883.29	19.69	39.68
21/07/1964	22.8	0	0	0.00	0.00	74.74	0.00	2.64	14.28	3.80	0.00	3.42	42.10	21559.72	19.69	22.42
22/07/1964	23.3	0	0	0.00	0.00	78.11	0.00	2.81	14.23	4.02	0.00	3.42	25.84	13230.14	19.69	6.15
23/07/1964	24	0	0	0.00	0.00	78.03	0.00	2.69	14.21	4.25	0.00	3.42	9.59	4903.57	19.69	0.00
24/07/1964	22.8	0	0	0.00	0.00	74.74	0.00	2.64	14.18	3.77	0.00	3.42	3.42	1753.42	19.69	0.00
25/07/1964	19.3	0	0	0.00	0.00	62.39	0.00	2.09	14.15	2.88	0.00	3.42	3.42	1753.42	19.69	0.00
26/07/1964	18.4	2.8	0	2.8	0.00	63.76	0.00	2.09	14.11	2.97	0.00	3.42	3.42	1753.42	0.00	3.42
27/07/1964	19.3	0	0	0.00	0.00	65.14	0.00	2.20	14.08	3.16	0.00	3.42	6.85	3506.85	0.00	6.85
28/07/1964	19.5	0	0	0.00	0.00	65.68	0.00	2.20	14.04	3.14	0.00	3.42	10.27	5290.27	19.69	0.00
29/07/1964	19.8	0	0	0.00	0.00	66.51	0.00	2.20	14.01	3.13	0.00	3.42	3.42	1753.42	19.69	0.00
30/07/1964	19.8	0	0	0.00	0.00	66.51	0.00	2.20	13.97	3.12	0.00	3.42	3.42	1753.42	19.69	0.00
31/07/1964	22.3	0	0	0.00	0.00	73.37	0.00	2.64	13.94	3.72	0.00	3.42	3.42	1753.42	19.69	0.00
01/08/1964	23.5	0	0	0.00	0.00	76.96	0.00	2.81	13.90	3.82	0.00	3.42	3.42	1753.42	19.69	0.00
02/08/1964	24.3	0	0	0.00	0.00	73.62	0.00	2.49	13.87	4.18	0.00	3.42	3.42	1753.42	19.69	0.00
03/08/1964	24.8	0.2	0	0.2	0.00	80.22	0.00	2.99	13.84	4.13	0.00	3.42	3.42	1753.42	19.69	0.00
04/08/1964	23.5	0	0	0.00	0.00	78.66	0.00	2.81	13.80	3.80	0.00	3.42	3.42	1753.42	19.69	0.00
05/08/1964	23.5	0	0	0.00	0.00	78.66	0.00	2.81	13.77	3.89	0.00	3.42	3.42	1753.42	19.69	0.00
06/08/1964	24.5	7.4	0	7.4	0.00	79.40	0.00	2.69	13.73	4.10	3.30	3.42	9.72	3441.41	0.00	9.72
07/08/1964	24.5	7.4	0	7.4	0.00	79.40	0.00	2.69	13.70	4.09	3.31	3.42	13.45	6889.08	0.00	13.45
08/08/1964	24.8	39.8	0	39.8	0.00	80.22	0.00	2.99	13.66	4.08	28.72	3.42	43.80	22329.89	0.00	43.80
09/08/1964	23.8	0.2	0	0.2	0.00	77.48	0.00	2.81	13.63	3.84	0.00	3.42	49.02	24079.30	0.00	47.92
10/08/1964	25.3	0.2	0	0.2	0.00	81.59	0.00	3.17	13.59	4.30	0.00	3.42	50.45	25829.78	19.69	30.76
11/08/1964	22.3	28	0	28	0.00	73.37	0.00	2.64	13.60	3.82	21.38	3.42	65.67	28452.03	0.00	65.67
12/08/1964	22.3	6.8	0	6.8	0.00	73.37	0.00	2.64	13.53	3.81	3.19	3.42	62.19	31849.67	0.00	62.19
13/08/1964	24.8	0	0	0.00	0.00	80.22	0.00	2.99	13.49	4.03	0.00	3.42	65.61	33503.99	0.00	65.61
14/08/1964	24.8	0	0	0.00	0.00	80.22	0.00	2.99	13.45	4.02	0.00	3.42	69.04	35347.42	19.69	49.35
15/08/1964	22.5	0	0	0.00	0.00	73.91	0.00	2.64	13.42	3.88	0.00	3.42	62.78	27003.84	19.69	33.09
16/08/1964	24.5	0	0	0.00	0.00	79.40	0.00	2.69	13.39	4.00	0.00	3.42	36.51	18894.27	19.69	16.82
17/08/1964	20.9	0	0	0.00	0.00	69.29	0.00	2.34	13.35	3.17	0.00	3.42	20.25	10367.68	19.69	0.58
18/08/1964	18.3	1.4	0	1.4	0.00	62.39	0.00	2.09	13.32	2.81	0.00	3.42	3.99	2041.12	0.00	3.99
19/08/1964	19.8	0.6	0	0.6	0.00	66.51	0.00	2.20	13.28	2.87	0.00	3.42	7.41	3794.84	0.00	7.41
20/08/1964	19.3	0	0	0.00	0.00	58.91	0.00	1.82	13.25	2.48	0.00	3.42	10.94	6947.97	0.00	10.94
21/08/1964	19.8	0	0	0.00	0.00	60.51	0.00	2.20	13.22	2.85	0.00	3.42	14.28	7291.39	19.69	0.00
22/08/1964	20.3	7.8	0	7.8	0.00	67.84	0.00	2.34	13.18	3.13	4.97	3.42	8.99	4144.84	0.00	8.99
23/08/1964	19.8	0	0	0.00	0.00	63.76	0.00	2.09	13.15	2.77	0.00	3.42	11.52	6898.08	0.00	11.52
24/08/1964	17.3	0	0	0.00	0.00	58.65	0.00	1.84	13.11	2.61	0.00	3.42	14.84	7851.49	19.69	0.00
25/08/1964	17.3	0	0	0.00	0.00	58.65	0.00	1.84	13.08	2.60	0.00	3.42	3.42	1753.42	19.69	0.00
26/08/1964	16	0	0	0.00	0.00	61.57	0.00	2.09	13.04	2.78	0.00	3.42	3.42	1753.42	19.69	0.00
27/08/1964	22.8	0	0	0.00	0.00	74.74	0.00	2.64	13.01	3.49	0.00	3.42	3.42	1753.42	19.69	0.00
28/08/1964	24	4.4	0	4.4	0.00	78.03	0.00	2.69	12.97	3.89	0.52	3.42	3.84	2012.83	0.00	3.84
29/08/1964	21.5	0	0	0.00	0.00	71.17	0.00	2.49	12.94	3.25	0.00	3.42	7.37	3771.35	0.00	7.37
30/08/1964	22.3	14	0	14	0.00	73.37	0.00	2.64	12.91	3.44	19.56	3.42	21.35	19930.69	0.00	21.35
31/08/1964	19	0	0	0.00	0.00	64.31	0.00	2.20	12.87	2.88	0.00	3.42	24.77	12884.31	0.00	24.77
01/09/1964	17.8	8	0	8	0.00	61.02	0.00	1.84	12.84	2.55	6.45	3.42	33.85	17229.33	0.00	33.85
02/09/1964	20	10	0	10	0.00	67.09	0.00	2.34	12.80	3.04	6.99	3.42	44.92	22844.81	0.00	44.92
03/09/1964	15	0	0	0.00	0.00	53.34	0.00	1.71	12.77	2.25	0.00	3.42	47.46	24999.24	0.00	47.46
04/09/1964	18.3	0.2	0	0.2	0.00	58.91	0.00	1.82	12.73	2.39	0.00	3.42	50.88	26951.06	9.84	41.04
05/09/1964	12.8	0	0	0.00	0.00	47.30	0.00	1.40	12.70	1.85	0.					

**Runnings Daily Water Balance, Reeb Quarry - Phase 2
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate I: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
7000 L/min 3500 L/min
0.125 m³/s 0.0625 m³/s
19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
1753.42 m³/day
3.42 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 634.52 mm
324876 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
24/09/1964	20	1	0	1	0.00	67.00	0.00	2.34	12.09	2.87	0.00	3.42	105.13	53626.70	0.00	105.13
25/09/1964	20.5	12.2	0	12.2	0.00	68.43	0.00	2.34	12.09	2.85	9.35	3.42	117.99	60985.25	0.00	117.99
26/09/1964	19.8	0	0	0	0.00	41.82	0.00	1.23	12.00	1.55	0.00	3.42	121.33	62118.67	0.00	121.33
27/09/1964	8	0	0	0	0.00	34.14	0.00	1.07	11.97	1.39	0.00	3.42	124.75	63272.99	9.84	114.91
28/09/1964	11.3	0	0	0	0.00	43.19	0.00	1.31	11.84	1.64	0.00	3.42	118.33	60585.52	9.84	108.49
29/09/1964	11.3	0	0	0	0.00	43.19	0.00	1.31	11.81	1.64	0.00	3.42	111.91	57208.94	9.84	102.07
30/09/1964	11.3	1.4	0	1.4	0.00	43.19	0.00	1.31	11.87	1.63	0.00	3.42	105.49	54012.37	0.00	105.49
01/10/1964	11	3.2	0	3.2	0.00	42.37	0.00	1.31	11.84	1.63	1.67	3.42	110.49	58770.04	0.00	110.49
02/10/1964	10.5	9.4	0	9.4	0.00	41.00	0.00	1.23	11.81	1.52	0.00	3.42	113.91	60523.47	0.00	113.91
03/10/1964	15.8	0	0	0	0.00	55.53	0.00	1.71	11.78	2.07	0.00	3.42	117.34	63079.89	9.84	107.49
04/10/1964	9	0	0	0	0.00	38.83	0.00	1.15	11.75	1.42	0.00	3.42	110.92	56790.92	9.84	101.07
05/10/1964	9.5	0	0	0	0.00	38.25	0.00	1.15	11.72	1.42	0.00	3.42	104.50	53503.74	9.84	94.66
06/10/1964	9.3	0	0	0	0.00	37.70	0.00	1.15	11.69	1.42	0.00	3.42	98.08	50217.17	9.84	88.24
07/10/1964	12.3	1.8	0	1.8	0.00	45.93	0.00	1.40	11.66	1.71	0.00	3.42	91.75	46978.33	0.00	91.75
08/10/1964	15.8	0.2	0	0.2	0.00	55.53	0.00	1.71	11.63	2.04	0.00	3.42	95.18	48731.78	0.00	95.18
09/10/1964	19.8	0	0	0	0.00	58.28	0.00	1.82	11.60	2.17	0.00	3.42	98.59	50485.19	9.84	88.75
10/10/1964	15.8	0	0	0	0.00	55.53	0.00	1.71	11.57	2.03	0.00	3.42	92.18	47199.81	9.84	82.34
11/10/1964	13.3	0.2	0	0.2	0.00	48.66	0.00	1.50	11.54	1.80	0.00	3.42	85.77	43812.03	9.84	75.92
12/10/1964	13	0.4	0	0.4	0.00	47.65	0.00	1.50	11.50	1.79	0.00	3.42	79.35	40425.46	0.00	79.35
13/10/1964	10.2	0	0	0	0.00	40.45	0.00	1.23	11.47	1.48	0.00	3.42	82.77	42378.88	9.84	72.93
14/10/1964	12.6	0	0	0	0.00	49.48	0.00	1.40	11.44	1.67	0.00	3.42	76.35	39092.31	9.84	66.51
15/10/1964	15.6	0	0	0	0.00	54.71	0.00	1.71	11.41	2.01	0.00	3.42	69.93	35805.73	9.84	60.09
16/10/1964	15	0	0	0	0.00	52.34	0.00	1.71	11.38	2.01	0.00	3.42	63.51	32519.15	9.84	53.67
17/10/1964	19.8	4.8	0	4.8	0.00	58.28	0.00	1.82	11.35	2.12	2.68	3.42	57.17	30004.66	0.00	57.17
18/10/1964	13.2	0.4	0	0.4	0.00	48.66	0.00	1.50	11.32	1.78	0.00	3.42	50.75	27527.88	0.00	50.75
19/10/1964	15	15	0	15	0.00	53.34	0.00	1.71	11.29	1.99	13.01	3.42	44.33	40772.36	0.00	44.33
20/10/1964	13.3	0	0	0	0.00	48.66	0.00	1.50	11.26	1.78	0.00	3.42	37.91	37485.79	0.00	37.91
21/10/1964	18	1.8	0	1.8	0.00	53.34	0.00	1.71	11.23	1.99	0.00	3.42	31.49	34199.21	0.00	31.49
22/10/1964	11.3	0	0	0	0.00	43.19	0.00	1.31	11.20	1.54	0.00	3.42	25.07	30912.64	0.00	25.07
23/10/1964	8.8	0	0	0	0.00	36.33	0.00	1.07	11.16	1.27	0.00	3.42	18.65	27626.06	9.84	18.65
24/10/1964	10.8	0	0	0	0.00	41.00	0.00	1.23	11.13	1.44	0.00	3.42	12.23	24339.49	9.84	12.23
25/10/1964	9.3	5.4	0	5.4	0.00	34.99	0.00	1.07	11.10	1.26	-1.14	3.42	5.81	21052.87	0.00	5.81
26/10/1964	12.5	0.8	0	0.8	0.00	48.48	0.00	1.40	11.07	1.62	0.00	3.42	0.39	17685.40	0.00	0.39
27/10/1964	17	0	0	0	0.00	58.63	0.00	1.84	11.04	2.20	0.00	3.42	0.01	18838.82	0.00	0.01
28/10/1964	18.5	0	0	0	0.00	62.84	0.00	2.00	11.01	2.32	0.00	3.42	0.01	20092.24	9.84	0.01
29/10/1964	19	0	0	0	0.00	59.62	0.00	1.82	10.98	2.12	0.00	3.42	0.01	21345.66	9.84	0.01
30/10/1964	9.5	0	0	0	0.00	38.25	0.00	1.15	10.95	1.32	0.00	3.42	0.01	22599.08	9.84	0.01
31/10/1964	10.5	0	0	0	0.00	41.00	0.00	1.23	10.92	1.41	0.00	3.42	0.01	23852.50	9.84	0.01
01/11/1964	12	9.2	0	9.2	0.00	45.11	0.00	1.40	10.89	1.60	0.00	3.42	0.01	25105.92	0.00	0.01
02/11/1964	9	0	0	0	0.00	20.42	0.00	0.78	10.86	0.98	0.00	3.42	0.01	26359.34	0.00	0.01
03/11/1964	8	0.4	0	0.4	0.00	22.54	0.00	0.78	10.83	0.88	0.00	3.42	0.01	27612.76	0.00	0.01
04/11/1964	9	20	0	20	0.00	36.89	0.00	1.15	10.79	1.31	18.89	3.42	0.01	28866.18	0.00	0.01
05/11/1964	11.3	1.4	0	1.4	0.00	43.19	0.00	1.31	10.76	1.48	0.00	3.42	0.01	30119.60	0.00	0.01
06/11/1964	3.5	0.2	0	0.2	0.00	21.79	0.00	0.78	10.73	0.88	0.00	3.42	0.01	31373.02	0.00	0.01
07/11/1964	2.8	0	0	0	0.00	19.87	0.00	0.71	10.70	0.82	0.00	3.42	0.01	32626.44	9.84	0.01
08/11/1964	2.3	0.2	0	0.2	0.00	32.22	0.00	1.00	10.67	1.14	0.00	3.42	0.01	33879.86	9.84	0.01
09/11/1964	11.8	14	0	14	0.00	44.59	0.00	1.31	10.64	1.46	12.54	3.42	0.01	35133.28	0.00	0.01
10/11/1964	11.8	15.4	0	15.4	0.00	44.59	0.00	1.31	10.61	1.46	14.84	3.42	0.01	36386.70	0.00	0.01
11/11/1964	10	2	0.2	2.2	0.20	39.82	0.20	1.23	10.58	1.37	0.83	3.42	0.01	37640.12	0.00	0.01
12/11/1964	-0.5	0	0.2	0.2	0.20	6.00	0.00	0.58	10.55	0.67	0.00	3.42	0.01	38893.54	0.00	0.01
13/11/1964	2	0	0	0	0.20	17.69	0.20	0.71	10.52	0.90	0.00	3.42	0.01	40146.96	9.84	0.01
14/11/1964	4	0	0	0	0.00	23.18	0.00	0.81	10.49	0.97	0.00	3.42	0.01	41400.38	9.84	0.01
15/11/1964	8.5	5.8	0	5.8	0.00	25.81	0.00	0.87	10.46	1.19	4.81	3.42	0.01	42653.80	0.00	0.01
16/11/1964	4.8	0	0	0	0.00	25.36	0.00	0.81	10.42	0.91	0.00	3.42	0.01	43907.22	0.00	0.01
17/11/1964	3.3	0	0	0	0.00	21.24	0.00	0.78	10.39	0.85	0.00	3.42	0.01	45160.64	9.84	0.01
18/11/1964	4.8	0	0	0	0.00	25.36	0.00	0.81	10.36	0.90	0.00	3.42	0.01	46414.06	9.84	0.01
19/11/1964	-2	0	0	0	0.00	0.00	0.00	0.58	10.33	0.68	0.00	3.42	0.01	47667.48	9.84	0.01
20/11/1964	-3.5	0	0	0	0.00	0.00	0.00	0.52	10.30	0.60	0.00	3.42	0.01	48920.90	9.84	0.01
21/11/1964	-1.8	0	0	0	0.00	0.00	0.00	0.58	10.27	0.68	0.00	3.42	0.01	50174.32	9.84	0.01
22/11/1964	-1	0	0	0	0.00	0.00	0.00	0.58	10.24	0.65	0.00	3.42	0.01	51427.74	9.84	0.01
23/11/1964	-4.8	0	0	0	0.00	25.36	0.00	0.81	10.21	0.89	0.00	3.42	0.01	52681.16	9.84	0.01
24/11/1964	-4.3	0	0	0	0.00	23.09	0.00	0.81	10.18	0.89	0.00	3.42	0.01	53934.58	9.84	0.01
25/11/1964	2.8	9	0	9	0.00	33.59	0.00	1.00	10.15	1.08	0.00	3.42	0.01	55188.00	9.84	0.01
26/11/1964	6.8	0	0	0	0.00	30.85	0.00	0.84	10.12	1.01	0.00	3.42	0.01	56441.42	9.84	0.01
27/11/1964	11.3	0	0	0	0.00	43.19	0.00	1.31	10.09	1.39	0.00	3.42	0.01	57694.84	9.84	0.01
28/11/1964	13.8	4.8	0	4.8	0.00	41.82	0.00	1.23	10.05	1.35	3.30	3.42	0.01	58948.26	0.00	0.01
29/11/1964	3.5	0	0	0	0.00	21.79	0.00	0.78	10.02	0.94	0.00	3.42	0.01	60201.68	0.00	0.01
30/11/1964	4.3	3.4	0	3.4	0.00	23.99	0.00	0.81	9.99	0.87	2.63	3.42	0.01	61455.10	0.00	0.01
01/12/1964	3.3	0.4	0	0.4	0.00	21.24	0.00	0.78	9.95	0.81	0.00	3.42	0.01	62708.52	0.00	0.01
02/12/1964	2.6	9	0	9	0.00	19.87	0.00	0.71	9.92	0.78	8.24	3.42	0.01	63961.94	0.00	0.01
03/12/1964	3.8	1.8	0	1.8	0.00	22.62	0.00	0.78	9.89	0.81	0.79	3.42	0.01	65215.36	0.00	0.01
04/12/1964	-3.3	0	0	0	0.00	0.00	0.00	0.52	9.87	0.57	0.00	3.42	0.01	66468.78	0.00	0.01

Running Daily Water Balance, Reeb Quarry - Phase 2
Climate Data 1965-2007

Station N: PORT COLBORNE
 Province: ONTARIO
 Latitude: 42.88
 Longitude: -79.25
 Elevation: 175.3
 Climate Id: 6136606
 WMO Identifier
 TC Identifier

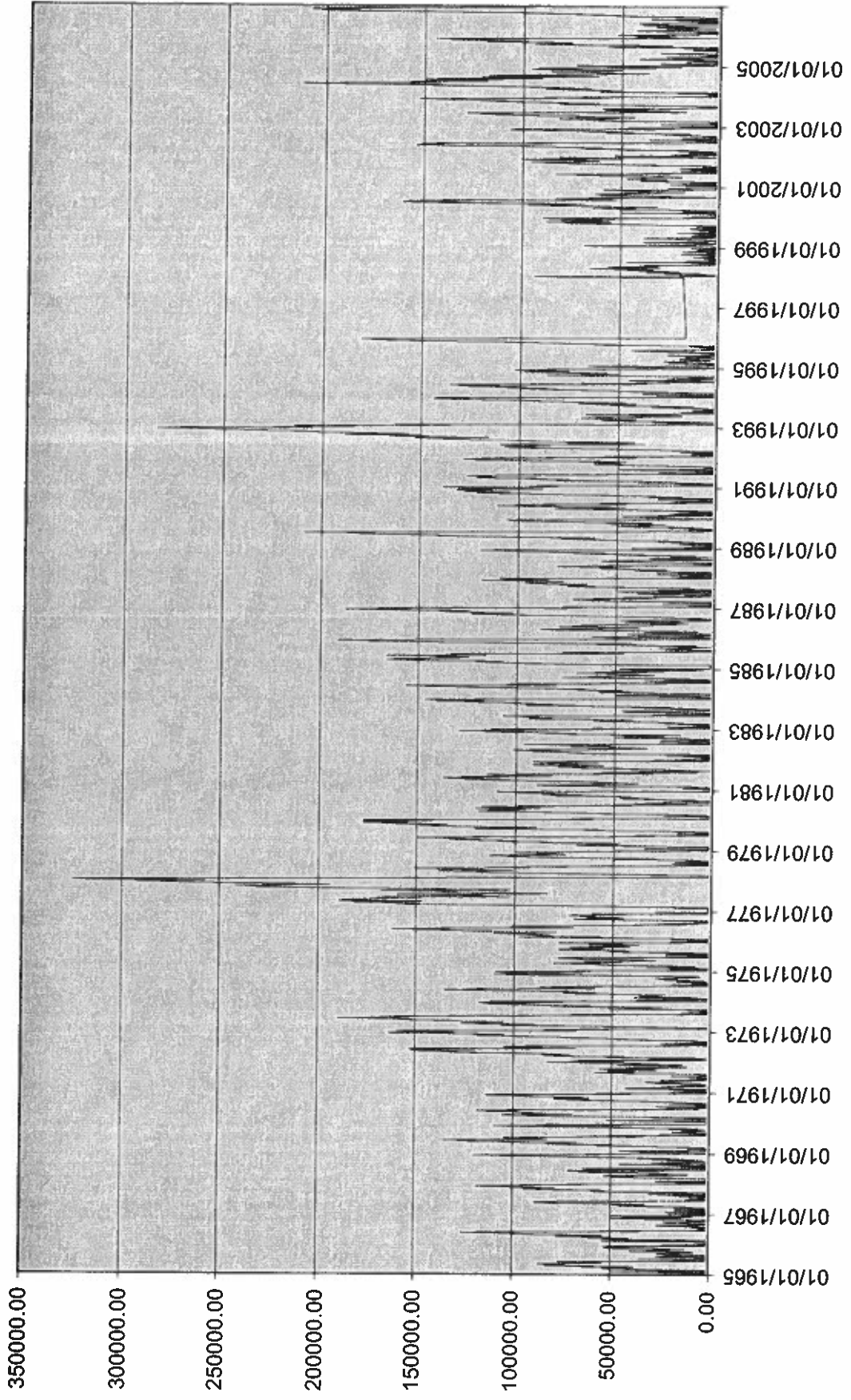
Max. Allowable Release: Summer, Winter Spring, Fall
 7000 L/min 3500 L/min
 0.125 m³/s 0.0625 m³/s
 19.69 mm 9.84 mm

Groundwater Inflow 640000 m³/yr
 1753.42 m³/day
 3.42 mm

Phase 1A Quarry Area 51.2 ha
 Max. Storage Volume 634.52 mm
 324876 m³

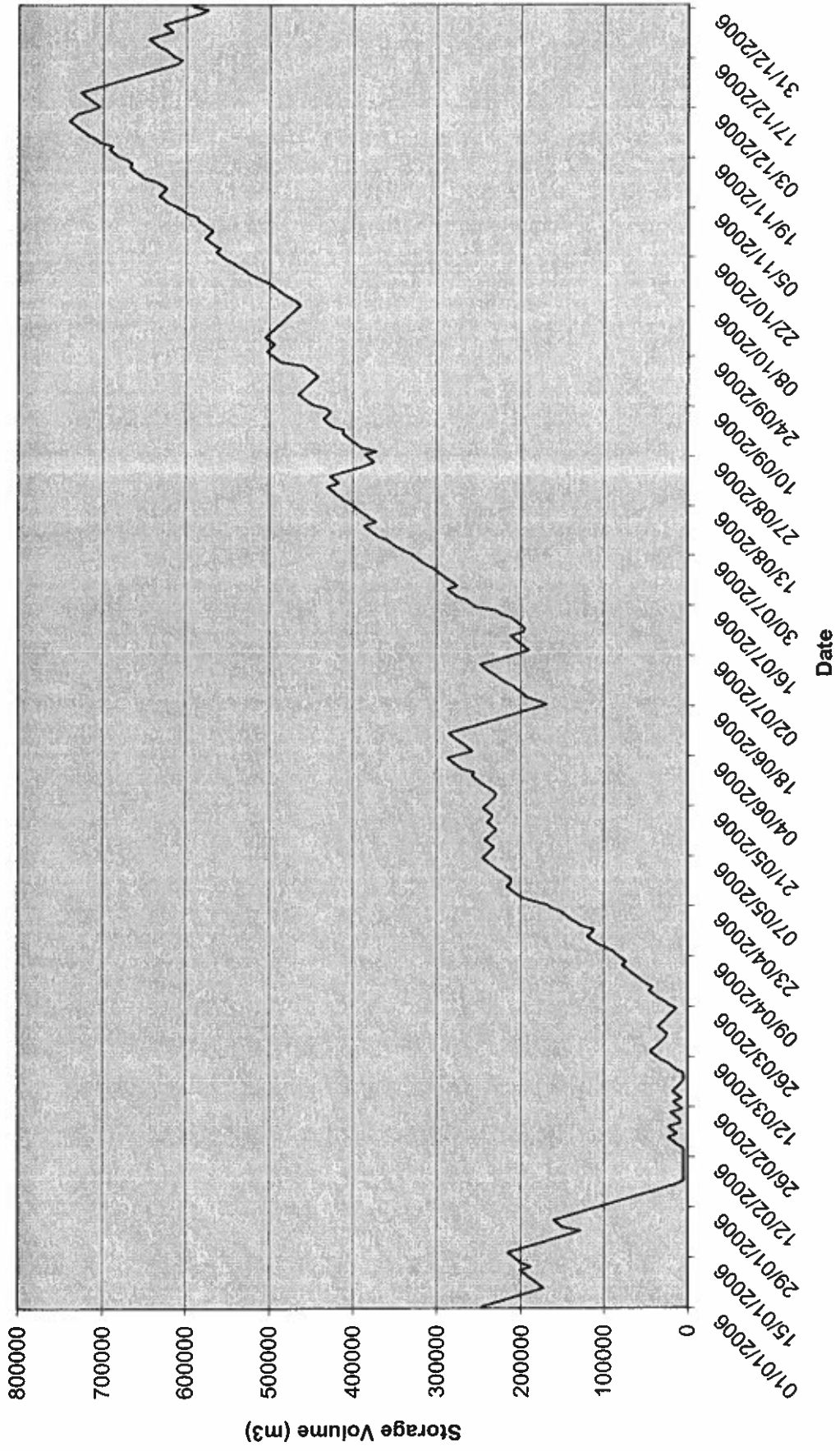
Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
22/12/1984	-3	0.2	0	0.2	0.00	20.42	0.00	0.78	9.31	0.78	0.00	3.42	24.12	12357.08	0.00	25.13
23/12/1984	0.8	0	0	0	0.00	0.00	0.00	0.61	9.28	0.62	0.00	3.42	27.56	14119.51	19.89	7.87
24/12/1984	5.5	2	0	2	0.00	27.28	0.00	0.87	9.25	0.86	1.84	3.42	33.23	6775.89	0.00	13.23
25/12/1984	-6.8	0	0	0	0.00	0.00	0.00	0.46	9.22	0.45	0.00	3.42	36.68	8529.31	0.00	16.68
26/12/1984	-4.3	0	1.8	1.8	1.80	0.00	0.00	0.59	9.18	0.61	0.00	3.42	39.94	10262.74	19.89	9.99
27/12/1984	1.3	0	0	0	1.80	15.78	1.80	0.68	9.16	0.65	7.15	3.42	49.97	5815.27	0.00	19.97
28/12/1984	5.5	13.8	0	13.8	0.00	27.28	0.00	0.87	9.13	0.85	12.05	3.42	57.34	13998.65	0.00	27.34
29/12/1984	10.5	27.6	0	27.6	0.00	41.00	0.00	1.23	9.10	1.17	28.43	3.42	67.19	20282.38	0.00	37.19
30/12/1984	-1	0	0	0	0.00	0.00	0.00	0.68	9.07	0.65	0.00	3.42	69.62	31035.80	0.00	40.62
31/12/1984	-1	23.2	0	23.2	0.00	0.00	0.00	0.59	9.07	0.58	22.82	3.42	86.68	44371.88	0.00	86.68

Required Storage Volume (m³) 1965-2006
Phase 2



**PHASE 2 WITH WORST CASE GROUNDWATER INFLOW
WATER BALANCE**

**Storage Volumes - Phase 2 (Worst Case Groundwater Inflow)
1992 - Highest Year Recorded**



**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate Id: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter 14000 L/min
Spring, Fall 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
21/1/1962	-2	0	0	0	0.00	0.00	0.00	0.07	0.58	0.00	10.70	460.18	245842.37	39.38	440.79	
22/1/1962	1.8	0	0	0	0.00	17.12	0.00	0.99	0.11	0.85	0.00	10.70	461.49	251181.82	39.38	412.11
23/1/1962	8.8	0	0	0	0.00	27.88	0.00	0.87	0.15	0.89	0.00	10.70	452.81	216481.27	39.38	365.44
24/1/1962	8.8	0	0	0	0.00	36.85	0.00	0.94	0.19	0.81	0.00	10.70	394.14	201890.73	39.38	354.77
25/1/1962	3.8	0	0	0	0.00	21.79	0.00	0.78	0.23	0.75	0.00	10.70	365.47	187120.18	39.38	326.09
26/1/1962	0.8	1	0	1	0.00	0.90	0.00	0.65	0.27	0.62	0.38	10.70	337.18	172938.99	0.00	337.18
27/1/1962	1.7	0	0	0	0.00	15.78	0.00	0.69	0.31	0.62	0.00	10.70	347.88	178139.01	0.00	347.88
28/1/1962	-0.3	0.8	0	0.8	0.00	0.90	0.00	0.59	0.35	0.59	0.21	10.70	298.79	163790.75	0.00	308.79
29/1/1962	2	1.8	0	1.8	0.00	17.69	0.00	0.71	0.39	0.72	1.58	10.70	270.58	149734.84	0.00	335.38
30/1/1962	1	0	2	2	2.00	0.00	0.00	0.68	0.43	0.67	0.00	10.70	381.28	165219.87	0.00	381.28
31/1/1962	0	0	0	0	2.00	0.00	0.00	0.61	0.47	0.63	0.00	10.70	391.98	200993.32	39.38	352.60
1/2/1962	2	1.2	0	1.2	2.00	17.69	2.00	0.71	0.51	0.73	2.47	10.70	305.78	187279.10	0.00	305.78
2/2/1962	3.8	13	0	13	0.00	21.79	0.00	0.70	0.55	0.78	12.22	10.70	389.70	199015.58	0.00	389.70
3/2/1962	-1.8	1	4	5	4.00	0.00	0.00	0.59	0.59	0.61	0.39	10.70	299.79	204993.70	0.00	309.79
4/2/1962	-4	0	0	0	4.00	0.00	0.00	0.41	0.63	0.44	0.00	10.70	419.49	210173.24	0.00	419.49
5/2/1962	-12.3	0	8	8	10.00	0.00	0.00	0.58	0.67	0.27	0.00	10.70	621.20	218552.99	39.38	381.82
6/2/1962	-7.8	0	1	1	11.00	0.00	0.00	0.41	0.70	0.45	0.00	10.70	392.52	200622.14	39.38	353.15
7/2/1962	-12.8	0	0	0	11.00	0.00	0.00	0.25	0.74	0.20	0.00	10.70	303.85	198291.58	39.38	314.46
8/2/1962	-10.8	0	0	0	11.00	0.00	0.00	0.27	0.78	0.20	0.00	10.70	333.16	171811.05	39.38	295.80
9/2/1962	-7	0	0	0	11.00	0.00	0.00	0.44	0.82	0.49	0.00	10.70	309.80	159900.50	39.38	267.13
10/2/1962	-4	0	0	0	21.00	0.00	0.00	0.52	0.85	0.87	0.00	10.70	277.83	142249.66	39.38	238.46
11/2/1962	-1.5	1.7	0	1.7	21.00	0.00	0.00	0.58	0.90	0.92	1.37	10.70	290.23	128118.13	0.00	290.23
12/2/1962	3	10.8	0	10.8	21.00	20.42	20.42	0.78	0.94	0.81	30.41	10.70	391.34	148184.65	0.00	391.34
13/2/1962	-2.8	0	0	0	0.58	0.00	0.00	0.52	0.96	0.58	0.00	10.70	302.94	154464.10	0.00	302.94
14/2/1962	-7	0	0	0	0.58	0.00	0.00	0.48	1.02	0.49	0.00	10.70	212.74	160123.55	39.38	273.37
15/2/1962	-7.8	0	0	0	0.58	0.00	0.00	0.41	1.00	0.46	0.00	10.70	284.07	145443.00	39.38	244.69
16/2/1962	-4.8	0	0	0	0.58	0.00	0.00	0.50	1.10	0.50	0.00	10.70	232.46	130782.45	39.38	216.02
17/2/1962	-3	0	0	0	0.58	0.00	0.00	0.58	1.14	0.55	0.00	10.70	226.72	116961.81	39.38	187.35
18/2/1962	-1.8	0	0	0	0.58	0.00	0.00	0.58	1.18	0.55	0.00	10.70	196.95	101461.36	39.38	158.57
19/2/1962	0.8	0	0	0	0.58	0.00	0.00	0.61	1.22	0.60	0.00	10.70	189.38	86720.81	39.38	130.00
20/2/1962	0.8	0	0	0	0.58	0.00	0.00	0.61	1.26	0.60	0.00	10.70	140.75	72940.26	39.38	101.38
21/2/1962	-8.8	0	0	0	0.58	0.00	0.00	0.38	1.30	0.44	0.00	10.70	112.03	57389.71	39.38	72.66
22/2/1962	-8.8	0	0	0	0.58	0.00	0.00	0.44	1.34	0.51	0.00	10.70	83.36	42679.17	39.38	43.98
23/2/1962	-3	0	0	0	0.58	0.00	0.00	0.58	1.38	0.56	0.00	10.70	54.66	27998.82	39.38	15.31
24/2/1962	-0.3	0	0	0	0.58	0.00	0.00	0.60	1.42	0.56	0.00	10.70	24.86	13961.81	39.38	0.00
25/2/1962	-5	0	0	0	0.58	0.00	0.00	0.59	1.46	0.58	0.00	10.70	10.70	5479.45	39.38	0.00
26/2/1962	-2.8	0	0	0	0.58	0.00	0.00	0.53	1.50	0.64	0.00	10.70	10.70	5479.45	39.38	0.00
27/2/1962	0.8	0	0	0	0.58	0.00	0.00	0.58	1.54	0.67	0.00	10.70	10.70	5479.45	39.38	0.00
28/2/1962	-1.8	0	0	0	0.58	0.00	0.00	0.59	1.58	0.68	0.00	10.70	10.70	5479.45	39.38	0.00
29/2/1962	-4.8	0	0	0	0.58	0.00	0.00	0.52	1.62	0.62	0.00	10.70	10.70	5479.45	39.38	0.00
30/2/1962	-8	0	0	0	0.58	0.00	0.00	0.45	1.66	0.57	0.00	10.70	10.70	5479.45	39.38	0.00
31/2/1962	-12.8	0	0	0	0.58	0.00	0.00	0.38	1.70	0.50	0.00	10.70	10.70	5479.45	39.38	0.00
1/3/1962	-12.8	0	0	0	0.58	0.00	0.00	0.38	1.74	0.50	0.00	10.70	10.70	5479.45	39.38	0.00
2/3/1962	-10.8	0	0	0	0.58	0.00	0.00	0.38	1.78	0.50	0.00	10.70	10.70	5479.45	39.38	0.00
3/3/1962	-7.8	0	0	0	0.58	0.00	0.00	0.44	1.82	0.56	0.00	10.70	10.70	5479.45	39.38	0.00
4/3/1962	-4.8	0	0	0	0.58	0.00	0.00	0.52	1.86	0.62	0.00	10.70	10.70	5479.45	39.38	0.00
5/3/1962	-1.8	0	0	0	0.58	0.00	0.00	0.60	1.90	0.68	0.00	10.70	10.70	5479.45	39.38	0.00
6/3/1962	1.8	0	0	0	0.58	0.00	0.00	0.68	1.94	0.74	0.00	10.70	10.70	5479.45	39.38	0.00
7/3/1962	4.8	0	0	0	0.58	0.00	0.00	0.76	1.98	0.80	0.00	10.70	10.70	5479.45	39.38	0.00
8/3/1962	7.8	0	0	0	0.58	0.00	0.00	0.84	2.02	0.86	0.00	10.70	10.70	5479.45	39.38	0.00
9/3/1962	10.8	0	0	0	0.58	0.00	0.00	0.92	2.06	0.92	0.00	10.70	10.70	5479.45	39.38	0.00
10/3/1962	13.8	0	0	0	0.58	0.00	0.00	1.00	2.10	0.98	0.00	10.70	10.70	5479.45	39.38	0.00
11/3/1962	16.8	0	0	0	0.58	0.00	0.00	1.08	2.14	1.04	0.00	10.70	10.70	5479.45	39.38	0.00
12/3/1962	19.8	0	0	0	0.58	0.00	0.00	1.16	2.18	1.10	0.00	10.70	10.70	5479.45	39.38	0.00
13/3/1962	22.8	0	0	0	0.58	0.00	0.00	1.24	2.22	1.16	0.00	10.70	10.70	5479.45	39.38	0.00
14/3/1962	25.8	0	0	0	0.58	0.00	0.00	1.32	2.26	1.22	0.00	10.70	10.70	5479.45	39.38	0.00
15/3/1962	28.8	0	0	0	0.58	0.00	0.00	1.40	2.30	1.28	0.00	10.70	10.70	5479.45	39.38	0.00
16/3/1962	31.8	0	0	0	0.58	0.00	0.00	1.48	2.34	1.34	0.00	10.70	10.70	5479.45	39.38	0.00
17/3/1962	34.8	0	0	0	0.58	0.00	0.00	1.56	2.38	1.40	0.00	10.70	10.70	5479.45	39.38	0.00
18/3/1962	37.8	0	0	0	0.58	0.00	0.00	1.64	2.42	1.46	0.00	10.70	10.70	5479.45	39.38	0.00
19/3/1962	40.8	0	0	0	0.58	0.00	0.00	1.72	2.46	1.52	0.00	10.70	10.70	5479.45	39.38	0.00
20/3/1962	43.8	0	0	0	0.58	0.00	0.00	1.80	2.50	1.58	0.00	10.70	10.70	5479.45	39.38	0.00
21/3/1962	46.8	0	0	0	0.58	0.00	0.00	1.88	2.54	1.64	0.00	10.70	10.70	5479.45	39.38	0.00
22/3/1962	49.8	0	0	0	0.58	0.00	0.00	1.96	2.58	1.70	0.00	10.70	10.70	5479.45	39.38	0.00
23/3/1962	52.8	0	0	0	0.58	0.00	0.00	2.04	2.62	1.76	0.00	10.70	10.70	5479.45	39.38	0.00
24/3/1962	55.8	0	0	0	0.58	0.00	0.00	2.12	2.66	1.82	0.00	10.70	10.70	5479.45	39.38	0.00
25/3/1962	58.8	0	0	0	0.58	0.00	0.00	2.20	2.70	1.88	0.00	10.70	10.70	5479.45	39.38	0.00
26/3/1962	61.8	0	0	0	0.58	0.00	0.00	2.28	2.74	1.94	0.00	10.70	10.70	5479.45	39.38	0.00
27/3/1962	64.8	0	0	0	0.58	0.00	0.00	2.36	2.78	2.00	0.00	10.70	10.70	5479.45	39.38	0.00
28/3/1962	67.8	0	0	0	0.58	0.00	0.00	2.44	2.82	2.06	0.00	10.70	10.70	5479.45	39.38	0.00
29/3/1962	70.8	0	0	0	0.58	0.00	0.00	2.52	2.86	2.12	0.00	10.70	10.70	5479.45	39.38	0.00
30/3/1962	73.8	0	0	0	0.58	0.00	0.00	2.60	2.90	2.18	0.00	10.70	10.70	5479.45	39.38	0.00
31/3/1962	76.8	0	0	0	0.58	0.00	0.00	2.68	2							

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1955-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate Id: 6136506
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter 14000 L/min
Spring, Fall 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
31/03/1952	3.5	0	5	5	5.00	11.79	5.00	0.76	12.59	1.63	3.87	10.70	97.83	50089.06	0.00	97.83
01/04/1952	1.3	2.2	0	2.2	0.00	15.76	0.00	0.66	12.83	0.90	1.30	10.70	109.63	56233.87	0.00	109.63
02/04/1952	-1.5	0	0	0	0.00	0.00	0.00	0.58	12.88	0.81	0.00	10.70	120.53	61713.32	0.00	120.53
03/04/1952	-1.5	1.8	0	1.8	0.00	3.00	0.00	0.58	12.69	0.81	0.79	10.70	132.03	67497.14	0.00	132.03
04/04/1952	2.8	0.4	0	0.4	0.00	19.87	0.00	0.71	12.73	0.87	0.00	10.70	145.73	73076.69	0.00	145.73
05/04/1952	3.5	0	0	0	0.00	21.70	0.00	0.70	12.70	1.04	0.00	10.70	153.43	78550.05	10.69	133.74
06/04/1952	2.3	0.8	0	0.8	0.00	18.69	0.00	0.71	12.80	0.98	0.00	10.70	144.44	73955.80	0.00	144.44
07/04/1952	7.3	0	0	0	0.00	32.22	0.00	1.00	12.83	1.37	0.00	10.70	155.15	78434.85	0.00	155.15
08/04/1952	5.5	0.8	0	0.8	0.00	27.28	0.00	0.87	12.88	1.20	0.00	10.70	163.85	84814.40	0.00	163.85
09/04/1952	6.5	1	0	1	0.00	20.47	0.00	0.84	12.90	1.28	0.00	10.70	176.85	92993.85	0.00	176.85
10/04/1952	7	5.2	0	5.2	0.00	31.90	0.00	1.00	12.95	1.38	3.82	10.70	181.07	97830.11	0.00	181.07
11/04/1952	5.5	11.1	0	11.1	0.00	27.28	0.00	0.87	12.97	1.21	9.89	10.70	211.67	108373.83	0.00	211.67
12/04/1952	3.8	0	0	0	0.00	22.82	0.00	0.75	13.00	1.08	0.00	10.70	222.37	113853.28	0.00	222.37
13/04/1952	-0.5	0	0	0	0.00	0.00	0.00	0.58	13.03	0.93	0.00	10.70	233.07	119337.74	10.69	213.38
14/04/1952	3	0	0	0	0.00	20.42	0.00	0.76	13.07	1.07	0.00	10.70	224.00	114732.19	10.69	204.40
15/04/1952	4.3	4.2	0	4.2	0.00	29.89	0.00	0.81	13.10	1.14	3.08	10.70	218.18	111986.35	0.00	218.18
16/04/1952	6.5	21.2	0	21.2	0.00	45.83	0.00	1.40	13.24	1.85	1.05	10.70	249.75	127350.10	0.00	249.75
17/04/1952	4.5	1.4	0	1.4	0.00	24.54	0.00	0.81	13.17	1.15	0.25	10.70	259.70	132998.14	0.00	259.70
18/04/1952	4.5	5.2	0	5.2	0.00	24.54	0.00	0.81	13.20	1.15	4.05	10.70	274.45	140520.16	0.00	274.45
19/04/1952	13	0	0	0	0.00	47.85	0.00	1.50	13.24	2.08	0.00	10.70	285.16	145999.61	0.00	285.16
20/04/1952	18	1.4	0	1.4	0.00	56.08	0.00	1.82	13.27	2.40	0.00	10.70	293.86	151479.07	0.00	293.86
21/04/1952	14.6	13.9	0	13.9	0.00	51.87	0.00	1.60	13.31	2.20	11.40	10.70	317.89	162793.94	0.00	317.89
22/04/1952	12.3	3	0	3	0.00	45.83	0.00	1.40	13.34	1.85	1.05	10.70	329.71	168909.14	0.00	329.71
23/04/1952	9.8	24	0	24	0.00	38.08	0.00	1.15	13.37	1.82	22.38	10.70	367.79	181487.78	0.00	367.79
24/04/1952	7.3	15.5	0	15.5	0.00	32.22	0.00	1.00	13.41	1.43	14.07	10.70	387.57	188433.41	0.00	387.57
25/04/1952	5.5	4.5	0	4.5	0.00	27.28	0.00	0.87	13.44	1.25	3.25	10.70	401.51	205575.17	0.00	401.51
26/04/1952	7.8	0	0	0	0.00	37.70	0.00	1.15	13.51	1.84	0.00	10.70	412.22	211694.82	0.00	412.22
27/04/1952	7.8	0	0	0	0.00	37.70	0.00	1.15	13.51	1.84	0.00	10.70	422.92	218334.08	10.69	403.23
28/04/1952	7.8	0	0	0	0.00	37.70	0.00	1.15	13.55	1.44	0.00	10.70	419.89	218333.53	10.69	394.25
29/04/1952	6.5	0	0	0	0.00	38.25	0.00	1.15	13.58	1.54	3.30	10.70	413.39	211099.83	0.00	413.39
30/04/1952	9.5	1.8	0	1.8	0.00	36.25	0.00	1.15	13.61	1.85	0.15	10.70	423.19	218857.23	0.00	423.19
01/05/1952	10	1.3	0	1.3	0.00	39.82	0.00	1.23	13.65	1.78	0.00	10.70	433.89	222136.68	0.00	433.89
02/05/1952	14.5	5.8	0	5.8	0.00	51.97	0.00	1.80	13.68	2.27	3.33	10.70	447.60	229233.60	0.00	447.60
03/05/1952	10.6	1.2	0	1.2	0.00	41.92	0.00	1.23	13.72	1.77	0.00	10.70	458.60	234802.95	0.00	458.60
04/05/1952	8.3	0	0	0	0.00	34.88	0.00	1.07	13.75	1.58	0.00	10.70	469.30	240282.40	0.00	469.30
05/05/1952	8.5	0	0	0	0.00	35.51	0.00	1.07	13.78	1.58	0.00	10.70	480.00	245761.85	10.69	469.30
06/05/1952	8.5	0	0	0	0.00	35.51	0.00	1.07	13.82	1.57	0.00	10.70	471.02	241181.30	10.69	451.33
07/05/1952	10.8	0	0	0	0.00	41.82	0.00	1.23	13.85	1.78	0.00	10.70	482.03	239580.76	10.69	442.35
08/05/1952	13.5	1	0	1	0.00	49.23	0.00	1.50	13.89	2.10	0.00	10.70	493.05	231980.21	0.00	493.05
09/05/1952	15.8	0	0	0	0.00	55.53	0.00	1.71	13.92	2.45	0.00	10.70	483.75	227439.86	0.00	483.75
10/05/1952	12.8	0	0	0	0.00	47.30	0.00	1.40	13.95	2.04	0.00	10.70	474.45	224291.11	10.69	454.76
11/05/1952	16.8	0	0	0	0.00	54.88	0.00	1.87	13.99	2.81	0.00	10.70	465.47	220318.86	10.69	445.78
12/05/1952	20	0	0	0	0.00	67.06	0.00	2.34	14.02	3.33	0.00	10.70	456.48	216318.02	10.69	436.79
13/05/1952	16.8	1	0	1	0.00	58.28	0.00	1.82	14.08	2.83	0.00	10.70	447.50	220117.47	0.00	447.50
14/05/1952	10.5	0	0	0	0.00	41.00	0.00	1.23	14.09	1.82	0.00	10.70	458.20	224509.02	0.00	458.20
15/05/1952	14.5	0	0	0	0.00	51.97	0.00	1.60	14.12	2.34	0.00	10.70	469.20	230076.37	10.69	449.21
16/05/1952	17	0	0	0	0.00	58.83	0.00	1.84	14.16	2.82	0.00	10.70	459.91	234475.82	10.69	440.23
17/05/1952	20.3	0.8	0	0.8	0.00	67.88	0.00	2.34	14.19	3.37	6.23	10.70	457.18	234065.20	0.00	457.18
18/05/1952	13.8	0	0	0	0.00	59.95	0.00	1.59	14.23	2.21	0.00	10.70	467.88	239544.86	0.00	467.88
19/05/1952	14.5	0	0	0	0.00	51.87	0.00	1.50	14.28	2.30	0.00	10.70	478.58	245024.11	10.69	458.88
20/05/1952	19	0	0	0	0.00	64.31	0.00	2.20	14.29	3.20	0.00	10.70	469.50	240423.66	10.69	449.89
21/05/1952	19.3	0	0	0	0.00	65.14	0.00	2.20	14.33	3.21	0.00	10.70	460.50	235823.01	10.69	440.90
22/05/1952	18.5	0	0	0	0.00	62.94	0.00	2.08	14.36	3.03	0.00	10.70	451.61	231222.36	10.69	431.92
23/05/1952	19.3	7.8	0	7.8	0.00	63.14	0.00	2.20	14.40	3.22	4.89	10.70	447.20	229885.86	0.00	447.20
24/05/1952	9	0	0	0	0.00	34.14	0.00	1.07	14.43	1.64	0.00	10.70	457.80	234445.11	0.00	457.80
25/05/1952	6.8	3.8	0	3.8	0.00	39.33	0.00	1.07	14.46	1.64	2.15	10.70	470.78	241090.43	0.00	470.78
26/05/1952	9	3.8	0	3.8	0.00	39.68	0.00	1.15	14.50	1.78	2.04	10.70	483.51	247555.87	0.00	483.51
27/05/1952	11.8	0	0	0	0.00	41.82	0.00	1.23	14.53	1.87	0.00	10.70	484.21	243035.02	0.00	484.21
28/05/1952	10	0	0	0	0.00	42.37	0.00	1.31	14.57	2.00	0.00	10.70	504.91	258514.47	10.69	485.22
29/05/1952	15.5	0	0	0	0.00	54.71	0.00	1.71	14.60	2.67	3.43	10.70	490.38	256570.13	0.00	490.38
30/05/1952	12.8	20.4	0	20.4	0.00	47.30	0.00	1.40	14.63	2.14	18.26	10.70	528.32	273499.35	0.00	528.32
31/05/1952	13.3	1.4	0	1.4	0.00	46.88	0.00	1.50	14.67	2.28	0.00	10.70	538.92	279778.90	0.00	538.92
01/06/1952	16.5	0	0	0	0.00	57.45	0.00	1.82	14.70	2.75	0.00	10.70	549.72	281458.28	0.00	549.72
02/06/1952	15.3	0	0	0	0.00	54.19	0.00	1.71	14.74	2.80	0.00	10.70	560.43	286937.71	39.38	521.05
03/06/1952	18.8	0	0	0	0.00	63.70	0.00	2.08	14.77	3.11	0.00	10.70	531.75	272267.16	39.38	492.38
04/06/1952	19.8	0.8	0	0.8	0.00	68.51	0.00	2.20	14.81	3.31	0.00	10.70	563.08	287578.61	0.00	563.08
05/06/1952	18.3	7.2	0	7.2	0.00	62.39	0.00	2.08	14.84	3.13	0.00	10.70	513.78	283056.98	0.00	513.78
06/06/1952	19	0.6	0	0.6	0.00	61.02	0.00	1.84	14.87	3.30	0.00	10.70	524.48	288535.32	0.00	524.48
07/06/1952	18.5	4.8	0	4.8	0.00	62.94	0.00	2.08	14.81	3.14	1.68	10.70	538.84	274863.19	0.00	538.84
08/06/1952	20	0	0	0	0.00	67.09	0.00	2.34	14.94	3.5						

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate lc 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter 14000 L/min
Spring, Fall 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
28/06/1992	19.5	0	0	0	0.00	65.69	0.00	2.20	15.04	3.36	0.00	10.70	456.38	232865.00	39.38	417.90
30/06/1992	20	0	0	0	0.00	67.06	0.00	2.34	15.01	3.67	0.00	10.70	427.70	218884.64	39.38	388.33
01/07/1992	20.3	0	0	0	0.00	67.88	0.00	2.34	14.97	3.55	0.00	10.70	399.03	204303.99	39.38	359.65
02/07/1992	19.3	3.4	0	3.4	0.00	65.14	0.00	2.20	14.94	3.34	0.00	10.70	370.41	192754.33	0.00	370.41
03/07/1992	20	9.2	0	9.2	0.00	67.00	0.00	2.34	14.90	3.54	0.00	10.70	361.32	185254.30	0.00	361.32
04/07/1992	19.3	4.2	0	4.2	0.00	65.14	0.00	2.20	14.87	3.33	0.87	10.70	362.69	201180.25	0.00	362.69
05/07/1992	20	0	0	0	0.00	67.00	0.00	2.34	14.83	3.53	0.00	10.70	403.69	208639.70	0.00	403.69
06/07/1992	19	0	0	0	0.00	66.06	0.00	1.82	14.80	2.77	0.00	10.70	414.30	212110.16	0.00	414.30
07/07/1992	18.8	0	0	0	0.00	68.28	0.00	1.82	14.76	2.78	0.00	10.70	385.62	197438.61	39.38	346.25
08/07/1992	18.8	26	0	26	0.00	63.78	0.00	2.08	14.73	3.10	22.60	10.70	378.81	184483.42	0.00	378.81
09/07/1992	20	0	0	0	0.00	67.06	0.00	2.34	14.70	3.48	0.00	10.70	360.85	192980.87	0.00	360.85
10/07/1992	20.3	1.6	0	1.6	0.00	67.88	0.00	2.34	14.66	3.48	0.00	10.70	401.23	205440.32	0.00	401.23
11/07/1992	19.3	0	0	0	0.00	65.14	0.00	2.20	14.63	3.27	0.00	10.70	411.65	210919.77	0.00	411.65
12/07/1992	19.5	16.4	0	16.4	0.00	63.88	0.00	2.20	14.59	3.28	13.14	10.70	435.70	223124.82	0.00	435.70
13/07/1992	21.6	1.2	0	1.2	0.00	71.17	0.00	2.49	14.56	3.69	0.00	10.70	448.49	228604.28	0.00	448.49
14/07/1992	21	45	0	45	0.00	69.80	0.00	2.49	14.52	3.95	39.34	10.70	495.64	242420.30	0.00	495.64
16/07/1992	18.6	3.2	0	3.2	0.00	63.78	0.00	2.08	14.48	2.84	0.15	10.70	507.39	250181.65	0.00	507.39
16/07/1992	18.5	0.8	0	0.8	0.00	65.68	0.00	2.20	14.45	3.23	0.00	10.70	518.09	252281.11	0.00	518.09
17/07/1992	18	13	0	13	0.00	61.57	0.00	2.06	14.42	3.05	0.95	10.70	538.74	258337.05	0.00	538.74
18/07/1992	19.5	0	0	0	0.00	65.69	0.00	2.20	14.39	3.22	0.00	10.70	549.45	261165.51	0.00	549.45
18/07/1992	20.8	0	0	0	0.00	69.25	0.00	2.34	14.35	3.40	0.00	10.70	580.15	268795.86	39.38	540.77
20/07/1992	27	19.8	0	19.8	0.00	72.84	0.00	2.84	14.32	3.82	6.78	10.70	638.25	275888.09	0.00	638.25
21/07/1992	19.3	0	0	0	0.00	65.14	0.00	2.20	14.28	3.15	0.00	10.70	648.88	281095.51	0.00	648.88
22/07/1992	16.3	5.2	0	5.2	0.00	58.91	0.00	1.82	14.25	2.87	2.53	10.70	662.19	287842.16	0.00	662.19
23/07/1992	16.8	0.6	0	0.6	0.00	58.28	0.00	1.82	14.21	2.66	0.00	10.70	672.69	293321.00	0.00	672.69
24/07/1992	15.8	0	0	0	0.00	62.84	0.00	2.06	14.18	2.99	0.00	10.70	683.60	298801.00	0.00	683.60
25/07/1992	21	2	0	2	0.00	69.80	0.00	2.49	14.15	3.50	0.00	10.70	694.30	304280.51	0.00	694.30
26/07/1992	19.3	0	0	0	0.00	65.14	0.00	2.20	14.11	3.19	0.84	10.70	811.84	312824.88	0.00	811.84
27/07/1992	19.3	0	0	0	0.00	65.14	0.00	2.20	14.08	3.15	0.00	10.70	822.64	318742.90	0.00	822.64
28/07/1992	19	1.8	0	1.8	0.00	58.06	0.00	1.82	14.04	2.83	0.00	10.70	833.25	324221.75	0.00	833.25
28/07/1992	20.6	0	0	0	0.00	69.43	0.00	2.34	14.01	3.32	0.00	10.70	843.95	328701.20	0.00	843.95
30/07/1992	19	10.8	0	10.8	0.00	68.06	0.00	1.82	13.97	2.82	8.18	10.70	862.83	336370.05	0.00	862.83
31/07/1992	13.3	8	0	8	0.00	48.06	0.00	1.60	13.84	2.17	5.83	10.70	878.38	347834.12	0.00	878.38
01/08/1992	10.3	0	0	0	0.00	69.81	0.00	1.82	13.80	2.80	0.00	10.70	900.07	353313.67	0.00	900.07
02/08/1992	21	0.8	0	0.8	0.00	62.89	0.00	2.49	13.81	3.49	0.00	10.70	708.77	348763.02	0.00	708.77
03/08/1992	16.8	1.4	0	1.4	0.00	66.51	0.00	2.20	13.84	3.09	10.91	10.70	722.38	350957.63	0.00	722.38
04/08/1992	17	2.6	0	2.6	0.00	58.63	0.00	1.84	13.80	2.75	0.00	10.70	733.08	353337.06	0.00	733.08
05/08/1992	16.8	0	0	0	0.00	58.28	0.00	1.82	13.77	2.67	0.00	10.70	743.78	358818.53	0.00	743.78
06/08/1992	16.5	0	0	0	0.00	62.84	0.00	2.06	13.73	2.90	0.00	10.70	754.48	368295.86	39.38	715.11
07/08/1992	21	3.2	0	3.2	0.00	69.80	0.00	2.49	13.70	3.45	0.00	10.70	725.81	371815.44	0.00	725.81
08/08/1992	22	6.4	0	6.4	0.00	72.84	0.00	2.84	13.65	3.85	2.76	10.70	738.27	375584.51	0.00	738.27
09/08/1992	21.8	0.4	0	0.4	0.00	71.69	0.00	2.49	13.63	3.42	0.00	10.70	748.87	379363.67	0.00	748.87
10/08/1992	21.8	5.8	0	5.8	0.00	71.69	0.00	2.49	13.59	3.42	2.38	10.70	763.08	380884.38	0.00	763.08
11/08/1992	20	0	0	0	0.00	67.00	0.00	2.34	13.56	3.22	0.00	10.70	773.78	386183.63	0.00	773.78
12/08/1992	15.6	1.4	0	1.4	0.00	55.53	0.00	1.71	13.53	2.38	0.00	10.70	784.48	401843.29	0.00	784.48
13/08/1992	15.5	9.8	0	9.8	0.00	64.71	0.00	1.71	13.49	2.37	4.43	10.70	799.59	409288.63	0.00	799.59
14/08/1992	16	0	0	0	0.00	58.28	0.00	1.82	13.45	2.81	0.00	10.70	810.28	414889.09	0.00	810.28
15/08/1992	17	2.4	0	2.4	0.00	58.63	0.00	1.84	13.42	2.87	0.00	10.70	820.98	420347.44	0.00	820.98
16/08/1992	18.5	0	0	0	0.00	62.84	0.00	2.06	13.39	2.82	0.00	10.70	831.69	425826.90	0.00	831.69
17/08/1992	17.3	0	0	0	0.00	59.85	0.00	1.94	13.35	2.65	0.00	10.70	842.40	431306.35	39.38	803.02
18/08/1992	17.5	1.6	0	1.6	0.00	60.20	0.00	1.94	13.32	2.65	0.00	10.70	813.72	418625.81	0.00	813.72
19/08/1992	17.5	0	0	0	0.00	60.20	0.00	1.94	13.28	2.64	0.00	10.70	824.42	424105.26	0.00	824.42
20/08/1992	14	0	0	0	0.00	50.80	0.00	1.60	13.23	2.20	0.00	10.70	835.13	427884.71	39.38	795.75
21/08/1992	18.3	0	0	0	0.00	68.81	0.00	1.82	13.22	2.81	0.00	10.70	806.45	412904.16	39.38	767.08
22/08/1992	19	0	0	0	0.00	64.31	0.00	2.20	13.18	2.85	0.00	10.70	777.78	398233.81	39.38	738.41
23/08/1992	21.8	0	0	0	0.00	71.89	0.00	2.49	13.15	3.30	0.00	10.70	748.11	383433.07	39.38	708.73
24/08/1992	21.3	13.6	0	13.6	0.00	70.62	0.00	2.49	13.11	3.30	10.30	10.70	730.73	374130.21	0.00	730.73
25/08/1992	23.3	0.4	0	0.4	0.00	78.11	0.00	2.81	13.08	3.69	0.00	10.70	741.44	379915.66	0.00	741.44
28/08/1992	23.5	0	0	0	0.00	75.86	0.00	2.81	13.04	3.68	0.00	10.70	752.14	385095.11	39.38	712.76
27/08/1992	22.3	4.8	0	4.8	0.00	73.37	0.00	2.84	13.01	3.47	1.13	10.70	724.80	370993.78	0.00	724.80
28/08/1992	20.8	28.8	0	28.8	0.00	67.68	0.00	2.34	12.87	3.06	25.72	10.70	761.02	389541.55	0.00	761.02
29/08/1992	15.8	0	0	0	0.00	55.53	0.00	1.71	12.84	2.28	0.00	10.70	771.72	395121.00	0.00	771.72
30/08/1992	19.3	4.2	0	4.2	0.00	65.14	0.00	2.20	12.81	2.89	1.31	10.70	783.73	401271.82	0.00	783.73
31/08/1992	19	0	0	0	0.00	64.31	0.00	2.20	12.87	2.88	0.00	10.70	794.44	406751.27	0.00	794.44
01/09/1992	19	0	0	0	0.00	58.06	0.00	1.82	12.84	2.40	0.00	10.70	805.14	412230.72	19.69	785.45
02/09/1992	17	8.4	0	8.4	0.00	58.83	0.00	1.94	12.80	2.85	8.85	10.70	802.00	410823.89	0.00	802.00
03/09/1992	20.5	29.2	0	29.2	0.00	65.49	0.00	2.34	12.77	3.03	17.12	10.70	808.88	414887.22	0.00	808.88
04/09/1992	18.5	0	0	0	0.00	62.84	0.00	2.06	12.73	2.89	0.00	10.70	840.58	420376.67	0.00	840.58
05/09/1992	20.3	0	0	0	0.00	67.88	0.00	2.34	12.70	3.02	0.00	10.70	851.28	425856.13	19.69	831.59
06/09/1992	22.8	0	0	0	0.00	74.74										

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2067**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate Ic: 6136606
WMO Identifier
TC Identifier

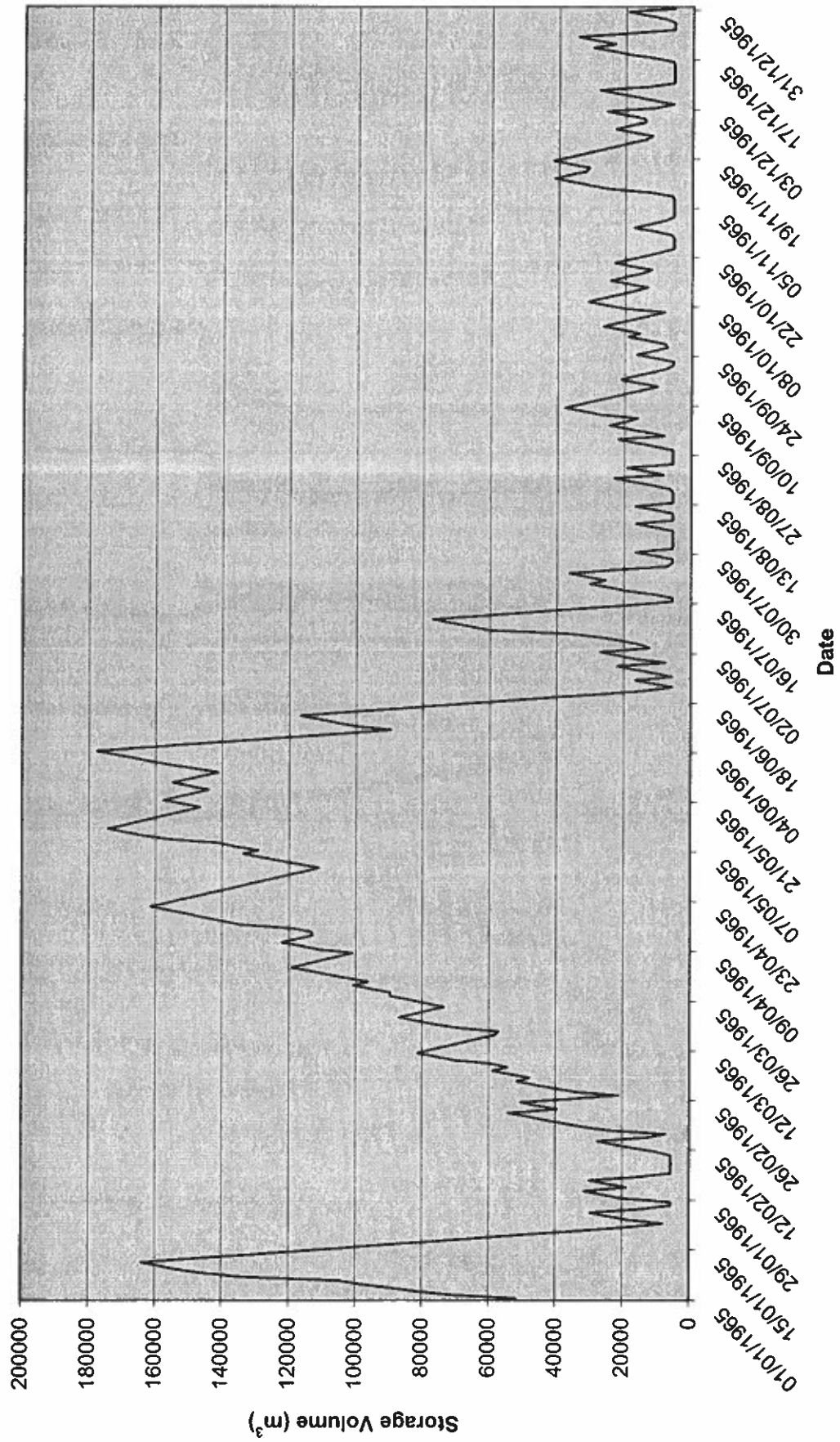
Max. Allowable Release: Summer, Winter 14000 L/min
Spring, Fall 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
27/09/1962	17.8	0.4	0	0.4	0.00	81.92	0.00	1.84	11.97	2.38	0.00	10.70	975.14	492771.88	0.00	975.14
28/09/1962	13.8	0	0	0	0.00	60.05	0.00	1.50	11.84	1.86	0.00	10.70	965.84	504751.33	10.00	965.84
29/09/1962	8.3	0	0	0	0.00	34.88	0.00	1.07	11.91	1.35	0.00	10.70	878.89	500190.78	10.00	878.89
30/09/1962	7.8	0	0	0	0.00	33.59	0.00	1.00	11.87	1.28	0.00	10.70	867.87	495520.23	10.00	867.87
01/10/1962	10.3	0	0	0	0.00	40.45	0.00	1.29	11.84	1.53	0.00	10.70	934.89	492949.99	10.00	934.89
02/10/1962	15.5	0	0	0	0.00	57.45	0.00	1.82	11.81	2.21	0.00	10.70	940.90	486340.14	10.00	940.90
03/10/1962	18.3	0	0	0	0.00	82.39	0.00	2.69	11.78	3.49	0.00	10.70	840.92	481748.59	10.00	840.92
04/10/1962	11.8	0	0	0	0.00	44.86	0.00	1.31	11.75	1.81	0.00	10.70	831.93	477148.04	10.00	831.93
05/10/1962	6	0	0	0	0.00	34.14	0.00	1.07	11.72	1.33	0.00	10.70	822.94	472547.49	10.00	822.94
06/10/1962	6.3	0	0	0	0.00	37.70	0.00	1.15	11.69	1.42	0.00	10.70	813.95	467946.94	10.00	813.95
07/10/1962	12.3	0	0	0	0.00	45.23	0.00	1.40	11.66	1.71	0.00	10.70	804.97	463346.40	10.00	804.97
08/10/1962	15.8	20	0	20	0.00	55.53	0.00	1.71	11.63	2.04	17.69	10.70	813.94	457939.07	0.00	813.94
09/10/1962	19.3	3.8	0	3.8	0.00	66.91	0.00	1.82	11.60	2.17	1.43	10.70	820.08	451550.56	0.00	820.08
10/10/1962	15.5	7.4	0	7.4	0.00	54.71	0.00	1.71	11.57	2.04	5.36	10.70	847.14	443278.53	0.00	847.14
11/10/1962	12.5	2	0	2	0.00	48.48	0.00	1.40	11.54	1.69	0.31	10.70	853.18	438015.06	0.00	853.18
12/10/1962	13	1.2	0	1.2	0.00	47.83	0.00	1.39	11.50	1.70	0.00	10.70	863.89	433495.43	0.00	863.89
13/10/1962	8	0	0	0	0.00	34.14	0.00	1.07	11.47	1.30	0.00	10.70	874.58	428974.89	0.00	874.58
14/10/1962	7.5	7	0	7	0.00	32.77	0.00	1.09	11.44	1.22	5.78	10.70	891.05	424515.12	0.00	891.05
15/10/1962	13.3	10.2	0	10.2	0.00	48.68	0.00	1.50	11.41	1.78	8.42	10.70	1010.17	417207.07	0.00	1010.17
16/10/1962	13.8	8.8	0	8.8	0.00	50.95	0.00	1.50	11.38	1.77	5.03	10.70	1025.90	425282.27	0.00	1025.90
17/10/1962	6.3	0	0	0	0.00	28.73	0.00	0.87	11.35	1.06	0.00	10.70	1038.60	430741.72	0.00	1038.60
18/10/1962	4	5	0	5	0.00	23.19	0.00	0.81	11.32	0.99	4.01	10.70	1051.32	436274.85	0.00	1051.32
19/10/1962	1.6	0	0	0	0.00	17.13	0.00	0.66	11.29	0.85	0.00	10.70	1064.02	441754.10	0.00	1064.02
20/10/1962	2.5	7	0	7	0.00	18.94	0.00	0.71	11.26	0.86	8.14	10.70	1076.84	447377.71	0.00	1076.84
21/10/1962	6.3	0	0	0	0.00	29.47	0.00	0.94	11.23	1.12	0.00	10.70	1089.56	453157.17	0.00	1089.56
22/10/1962	9	0	0	0	0.00	28.84	0.00	0.94	11.20	1.12	0.00	10.70	1100.27	458336.82	10.00	1090.56
23/10/1962	10	1.4	0	1.4	0.00	29.42	0.00	1.23	11.18	1.44	0.00	10.70	1091.28	458736.07	0.00	1091.28
24/10/1962	10.8	4.4	0	4.4	0.00	41.82	0.00	1.23	11.13	1.43	2.87	10.70	1194.85	458733.84	0.00	1194.85
25/10/1962	9	0	0	0	0.00	28.85	0.00	0.94	11.10	1.11	0.00	10.70	1185.85	457121.20	0.00	1185.85
26/10/1962	8.5	0	0	0	0.00	27.88	0.00	0.87	11.07	0.98	0.00	10.70	1193.35	456982.74	0.00	1193.35
27/10/1962	9	0.2	0	0.2	0.00	28.85	0.00	0.94	11.04	1.10	0.00	10.70	1187.37	457299.19	10.00	1097.28
28/10/1962	7.8	0.8	0	0.8	0.00	33.59	0.00	1.00	11.01	1.17	0.00	10.70	1198.38	457491.85	0.00	1198.38
29/10/1962	10.5	0.8	0	0.8	0.00	41.80	0.00	1.23	10.98	1.42	0.00	10.70	1189.08	457281.10	0.00	1189.08
30/10/1962	5.8	0	0	0	0.00	28.10	0.00	0.87	10.95	1.02	0.00	10.70	1199.79	457450.55	0.00	1199.79
31/10/1962	4.3	0	0	0	0.00	23.99	0.00	0.81	10.92	0.85	0.00	10.70	1140.49	456390.00	10.00	1140.49
01/11/1962	3.8	14.8	0	14.8	0.00	22.62	0.00	0.75	10.89	0.89	13.71	10.70	1145.72	456359.59	0.00	1145.72
02/11/1962	7.3	14.4	0	14.4	0.00	32.22	0.00	1.00	10.86	1.18	13.24	10.70	1189.18	458810.84	0.00	1189.18
03/11/1962	12.5	1.4	0	1.4	0.00	46.48	0.00	1.40	10.83	1.68	0.00	10.70	1179.88	460400.00	0.00	1179.88
04/11/1962	10.5	8.6	0	8.6	0.00	41.80	0.00	1.23	10.79	1.39	5.21	10.70	1185.77	461235.89	0.00	1185.77
05/11/1962	4.3	8.8	0	8.8	0.00	23.99	0.00	0.81	10.76	0.84	7.68	10.70	1214.34	461790.79	0.00	1214.34
06/11/1962	2.5	0	0	0	0.00	18.95	0.00	0.71	10.73	0.82	0.00	10.70	1225.04	462721.25	0.00	1225.04
07/11/1962	0.8	0	0	0	0.00	9.00	0.00	0.58	10.70	0.89	0.00	10.70	1235.74	463688.70	10.00	1245.95
08/11/1962	-0.3	0	0	0	0.00	0.00	0.00	0.58	10.67	0.88	0.00	10.70	1246.75	464655.15	10.00	1257.07
09/11/1962	2.8	0.8	0	0.8	0.00	18.87	0.00	0.71	10.64	0.81	0.00	10.70	1217.77	462487.60	0.00	1217.77
10/11/1962	6.5	1.8	0	1.8	0.00	35.31	0.00	1.07	10.61	1.20	0.60	10.70	1229.07	462882.06	0.00	1229.07
11/11/1962	8.8	5.8	0	5.8	0.00	39.96	0.00	1.15	10.58	1.28	4.62	10.70	1244.29	462878.37	0.00	1244.29
12/11/1962	10.8	18.0	0	18.0	0.00	41.82	0.00	1.23	10.55	1.38	17.24	10.70	1272.23	4631380.20	0.00	1272.23
13/11/1962	3	0	1	1	1.00	20.42	1.00	0.78	10.52	0.89	0.14	10.70	1283.07	463694.28	0.00	1283.07
14/11/1962	0.8	0	0	0	0.00	9.00	0.00	0.58	10.49	0.73	0.00	10.70	1293.78	464313.73	0.00	1293.78
15/11/1962	-0.5	0	1	1	1.00	0.00	0.00	0.58	10.46	0.68	0.00	10.70	1304.48	464799.18	10.00	1284.78
16/11/1962	-1	4.5	10	14.0	11.00	0.00	0.00	0.58	10.42	0.68	3.84	10.70	1289.43	465307.79	0.00	1289.43
17/11/1962	0.8	1	0	1	11.00	0.00	0.00	0.61	10.39	0.89	0.31	10.70	1310.44	467045.84	0.00	1310.44
18/11/1962	2.3	0	0	0	11.00	18.50	11.00	0.71	10.36	0.78	10.21	10.70	1331.35	468152.11	0.00	1331.35
19/11/1962	1.6	0	0	0	0.00	18.31	0.00	0.68	10.33	0.74	0.00	10.70	1342.05	468713.56	0.00	1342.05
20/11/1962	4.3	0	0	0	0.00	23.99	0.00	0.81	10.30	0.80	0.00	10.70	1352.75	469281.02	10.00	1353.07
21/11/1962	8.8	1.4	0	1.4	0.00	38.23	0.00	1.07	10.27	1.18	0.24	10.70	1344.01	468131.04	0.00	1344.01
22/11/1962	8.3	21	0	21	0.00	34.98	0.00	1.07	10.24	1.18	19.84	10.70	1374.54	470378.99	0.00	1374.54
23/11/1962	6.5	1.8	0	1.8	0.00	30.02	0.00	0.94	10.21	1.02	0.68	10.70	1385.83	470544.87	0.00	1385.83
24/11/1962	5.3	8.8	0	8.8	0.00	28.73	0.00	0.87	10.18	0.95	5.65	10.70	1402.18	471781.45	0.00	1402.18
25/11/1962	8	0.4	0	0.4	0.00	34.14	0.00	1.07	10.15	1.15	0.00	10.70	1412.88	472398.00	0.00	1412.88
26/11/1962	9	0.8	0	0.8	0.00	35.88	0.00	1.15	10.12	1.23	0.00	10.70	1423.59	472878.53	0.00	1423.59
27/11/1962	4.3	0	0	0	0.00	23.99	0.00	0.81	10.09	0.88	0.00	10.70	1434.29	473455.99	0.00	1434.29
28/11/1962	-4	0.4	0	0.4	0.00	23.18	0.00	0.81	10.05	0.88	0.00	10.70	1444.99	473955.20	10.00	1445.30
29/11/1962	3	0	0	0	0.00	20.42	0.00	0.78	10.02	0.82	0.00	10.70	1436.01	473524.71	10.00	1416.32
30/11/1962	3	0	0	0	0.00	20.42	0.00	0.78	9.99	0.82	0.00	10.70	1427.02	473084.16	30.38	1387.64
01/12/1962	2	0	0	0	0.00	17.88	0.00	0.71	9.96	0.78	0.00	10.70	1398.35	471583.81	30.38	1358.97
02/12/1962	2	8.8	0	8.8	0.00	17.88	0.00	0.71	9.93	0.78	0.04	10.70	1378.71	470436.95	0.00	1378.71
03/12/1962	0.3	0	0	0	0.00	9.00	0.00	0.61	9.90	0.69	0.00	10.70	1389.42	470845.40	0.00	1389.42
04/12/1962	0	2.4	3.2	5.6	3.20	0.00	0.00	0.58	9.87	0.66	1.74	10.70	1399.88	471817.10	0.00	1399.88
05/1																

**Storage Volumes - Phase 2 (Worst Case Groundwater Inflow)
1998 - Lowest Year Recorded**



**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1985-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate Id: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
14000 L/min 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/01/1985	-4.3	0	0	0	23.58	0.00	0.00	0.59	0.07	0.50	0.00	10.70	100.82	51871.29	0.00	100.82
02/01/1985	4.3	3	0	3	23.58	23.58	23.58	0.81	0.11	0.80	28.18	10.70	137.82	70941.39	0.00	137.82
03/01/1985	6.3	11.2	0	11.2	28.47	28.47	28.47	0.94	0.15	0.81	11.88	10.70	180.38	82115.13	0.00	180.38
04/01/1985	1.5	5.2	0	5.2	0.00	18.31	0.00	0.90	0.19	0.65	4.55	10.70	175.83	89921.75	0.00	175.83
05/01/1985	5.5	7	0	7	0.00	27.28	0.00	0.87	0.23	0.65	6.14	10.70	182.47	88544.78	0.00	182.47
06/01/1985	5.5	2.6	0	2.6	0.00	30.02	0.00	0.84	0.27	0.62	1.88	10.70	204.65	104882.81	0.00	204.65
07/01/1985	6.3	48.3	0	48.3	0.00	29.47	0.00	0.94	0.31	0.63	45.87	10.70	281.12	133995.27	0.00	281.12
08/01/1985	7	13.2	0	13.2	0.00	17.66	0.00	0.71	0.35	0.71	12.49	10.70	284.31	145887.90	0.00	284.31
09/01/1985	2.3	4.8	0	4.8	0.00	18.59	0.00	0.71	0.39	0.72	4.98	10.70	289.10	153187.94	0.00	289.10
10/01/1985	1.5	0	0	0	0.00	16.31	0.00	0.66	0.43	0.67	0.00	10.70	309.80	158616.61	0.00	309.80
11/01/1985	-4	0	0	0	0.00	0.00	0.00	0.52	0.47	0.55	0.00	10.70	320.50	164008.27	39.38	281.13
12/01/1985	-0.5	0	1	1	1.00	0.00	0.00	0.58	0.51	0.80	0.00	10.70	291.83	148415.72	39.38	252.45
13/01/1985	-7.5	0	0	0	1.00	0.00	0.00	0.41	0.55	0.44	0.00	10.70	263.15	134735.17	39.38	223.78
14/01/1985	-7	0	1.5	1.5	2.50	0.00	0.00	0.44	0.59	0.47	0.00	10.70	234.68	120994.82	39.38	195.11
15/01/1985	-5.8	0	0	0	8.9	12.19	0.00	0.47	0.63	0.50	0.00	10.70	205.81	105213.07	39.38	166.43
16/01/1985	-5	0	0	0	12.10	0.00	0.00	0.50	0.67	0.53	0.00	10.70	177.14	90663.53	39.38	137.76
17/01/1985	-7	0	0	0	12.10	0.00	0.00	0.44	0.70	0.48	0.00	10.70	148.46	76012.98	39.38	109.09
18/01/1985	-2	0	3	3	15.10	0.00	0.00	0.69	0.74	0.62	0.00	10.70	118.79	61332.43	39.38	80.41
19/01/1985	-3.8	0	3	3	18.10	0.00	0.00	0.62	0.78	0.57	0.00	10.70	91.12	48631.88	39.38	51.74
20/01/1985	-3.8	0	0	0	18.10	0.00	0.00	0.52	0.82	0.67	0.00	10.70	62.44	31871.33	39.38	23.07
21/01/1985	-9	0	0	0	15.10	0.00	0.00	0.47	0.86	0.51	0.00	10.70	33.77	17260.79	39.38	0.00
22/01/1985	-2.3	5	0	5	18.10	0.00	0.00	0.55	0.90	0.60	4.40	10.70	7.70	7290.81	0.00	15.10
23/01/1985	-0.3	11	0	11	18.10	0.00	0.00	0.58	0.94	0.63	19.37	10.70	36.17	18518.72	0.00	36.17
24/01/1985	-0.5	0	0	0	18.10	0.00	0.00	0.58	0.96	0.63	0.00	10.70	46.87	22668.17	0.00	46.87
25/01/1985	-1.5	0	2	2	20.10	0.00	0.00	0.58	1.02	0.64	0.00	10.70	57.57	28477.82	39.38	18.20
26/01/1985	-4.3	0	1	1	21.10	0.00	0.00	0.59	1.06	0.55	0.00	10.70	28.90	14787.07	39.38	0.00
27/01/1985	-7	0	0	0	21.10	0.00	0.00	0.58	1.10	0.65	0.00	10.70	7.70	5478.45	39.38	0.00
28/01/1985	9.5	0	0	0	21.10	0.00	0.00	0.61	1.14	0.67	0.00	10.70	10.70	5478.45	39.38	0.00
29/01/1985	1.5	13.8	0	13.8	21.10	18.31	18.31	0.69	1.18	0.73	28.18	10.70	39.88	20429.12	0.00	39.88
30/01/1985	9.8	0	0	0	4.79	0.00	0.00	0.61	1.22	0.68	0.00	10.70	50.59	25889.58	0.00	50.59
31/01/1985	-1.5	0	0	0	4.79	0.00	0.00	0.58	1.26	0.66	0.00	10.70	61.29	31378.03	39.38	21.91
01/02/1985	2.5	0	0	0	4.79	19.05	4.79	0.71	1.30	0.79	4.01	10.70	36.82	18760.05	0.00	36.82
02/02/1985	3.5	0	0	0	0.00	21.79	0.00	0.79	1.34	0.84	0.00	10.70	47.32	24228.90	0.00	47.32
03/02/1985	5	0	0	0	0.00	0.00	0.00	0.81	1.38	0.90	0.00	10.70	58.02	29738.95	39.38	18.65
04/02/1985	-2	0	0	0	0.00	0.00	0.00	0.69	1.42	0.87	0.00	10.70	22.35	15028.40	39.38	0.00
05/02/1985	-2	0	0	0	0.00	0.00	0.00	0.68	1.46	0.87	0.00	10.70	10.70	5478.45	39.38	0.00
06/02/1985	-2	0	0	0	0.00	0.00	0.00	0.68	1.50	0.87	0.00	10.70	10.70	5478.45	39.38	0.00
07/02/1985	-1	0	0	0	0.00	0.00	0.00	0.58	1.54	0.87	0.00	10.70	10.70	5478.45	39.38	0.00
08/02/1985	-0.3	0	0	0	0.00	0.00	0.00	0.59	1.58	0.87	0.00	10.70	10.70	5478.45	39.38	0.00
09/02/1985	-0.8	0	0	0	0.00	0.00	0.00	0.59	1.62	0.86	0.00	10.70	10.70	5478.45	39.38	0.00
10/02/1985	1.8	0	0	0	0.00	17.13	0.00	0.66	1.66	0.78	0.00	10.70	10.70	5478.45	39.38	0.00
11/02/1985	3.8	9.5	0	9.5	0.00	22.62	0.00	0.78	1.70	0.87	8.73	10.70	19.43	9947.83	0.00	19.43
12/02/1985	3	3	0	3	0.00	20.42	0.00	0.78	1.74	0.88	2.12	10.70	32.26	16513.60	0.00	32.26
13/02/1985	-1	0	0	0	0.00	0.00	0.00	0.58	1.78	0.89	0.00	10.70	42.85	21987.85	0.00	42.85
14/02/1985	-5	0	0	0	0.00	0.00	0.00	0.59	1.82	0.90	0.00	10.70	53.68	27472.40	39.38	14.28
15/02/1985	-4	0	0	0	0.00	0.00	0.00	0.52	1.86	0.93	0.00	10.70	24.98	12781.88	39.38	0.00
16/02/1985	1.5	3.6	0	3.6	0.00	18.31	0.00	0.80	1.90	0.78	2.82	10.70	13.83	6924.85	0.00	13.83
17/02/1985	3.5	22.8	0	22.8	0.00	21.79	0.00	0.79	1.94	0.89	21.91	10.70	46.13	23820.80	0.00	46.13
18/02/1985	4	5.6	0	5.6	0.00	23.18	0.00	0.81	1.98	0.89	4.84	10.70	61.48	31478.88	0.00	61.48
19/02/1985	2	1.2	0	1.2	0.00	17.88	0.00	0.71	1.102	0.84	0.38	10.70	72.64	37138.34	0.00	72.64
20/02/1985	2.5	1.8	0	1.8	0.00	19.05	0.00	0.71	1.105	0.84	0.00	10.70	84.18	43107.24	0.00	84.18
21/02/1985	2	0	0	0	0.00	17.88	0.00	0.71	1.110	0.85	0.00	10.70	84.80	48589.69	0.00	84.80
22/02/1985	2.3	0	0	0	0.00	18.50	0.00	0.71	1.114	0.85	0.00	10.70	105.92	54955.15	39.38	66.22
23/02/1985	2.3	0.6	0	0.6	0.00	18.50	0.00	0.71	1.118	0.85	0.00	10.70	78.92	39383.60	0.00	78.92
24/02/1985	2.3	0	0	0	0.00	18.50	0.00	0.71	1.122	0.85	0.00	10.70	87.63	44855.05	0.00	87.63
25/02/1985	4	0	0	0	0.00	23.18	0.00	0.81	1.126	0.86	0.00	10.70	98.33	50344.50	39.38	58.95
26/02/1985	2.8	0	0	0	0.00	18.87	0.00	0.71	1.130	0.86	0.00	10.70	89.98	35863.85	39.38	50.28
27/02/1985	6.5	1.4	0	1.4	0.00	30.02	0.00	0.94	1.134	1.13	0.27	10.70	41.25	21121.83	0.00	41.25
28/02/1985	3.5	15	0	15	0.00	21.79	0.00	0.78	1.138	0.93	14.07	10.70	80.63	38906.85	0.00	80.63
01/03/1985	3.5	3.2	0	3.2	0.00	21.79	0.00	0.78	1.142	0.93	2.27	10.70	78.90	40446.19	0.00	78.90
02/03/1985	3	0.4	0	0.4	0.00	20.42	0.00	0.78	1.146	0.94	0.00	10.70	89.70	45923.05	0.00	89.70
03/03/1985	2.5	0	0	0	0.00	18.02	0.00	0.71	1.150	0.88	0.00	10.70	100.40	61405.10	19.69	80.71
04/03/1985	1	2.8	0	2.8	0.00	0.00	0.00	0.66	1.154	0.82	1.88	10.70	93.30	47818.30	0.00	93.30
05/03/1985	1.3	0	0	0	0.00	15.79	0.00	0.68	1.158	0.83	0.00	10.70	104.09	53295.75	0.00	104.09
06/03/1985	1	0	0	0	0.00	0.00	0.00	0.69	1.162	0.83	0.00	10.70	114.80	58778.20	19.69	95.11
07/03/1985	1.5	0	0	0	0.00	0.00	0.00	0.69	1.166	0.83	0.00	10.70	125.51	64260.65	19.69	106.12
08/03/1985	4.8	20.6	0	20.6	0.00	25.39	0.00	0.81	1.170	1.02	19.58	10.70	116.40	59589.31	0.00	116.40
09/03/1985	7	9.6	2	11.8	2.00	31.39	2.00	1.00	1.174	1.25	10.35	10.70	137.45	70377.49	0.00	137.45
10/03/1985	-6.3	0	0	0	0.00	0.00	0.00	0.44	1.178	0.68	0.00	10.70	148.16	78858.05	0.00	148.16
11/03/1985	-8.3	0	1	1	1.00	0.00	0.00	0.38	1.182	0.61	0.00	10.70	158.86	81339.40	19.69	139.17
12/03/1985	-7.5	0	0	0	0.00	0.00	0.00	0.41	1.186	0.55	0.00	10.70	169.57	79735.65	19.69	150.18
13/03/1985	-7	0	0	0	0.00	0.00										

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
 Province: ONTARIO
 Latitude: 42.86
 Longitude: -79.25
 Elevation: 175.3
 Climate k: 6136606
 WMO Identifier:
 TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
 14000 L/min 7000 L/min
 0.125 m³/s 0.0625 m³/s
 39.36 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
 5479.452 m³/day
 10.70 mm

Phase 1A Quarry Area 51.2 ha
 Max. Storage Volume 1444.99 mm
 739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/04/1966		2.4	0	2.4	0.00	0.00	0.00	0.61	12.52	0.84	1.56	10.70	200.03	102415.17	0.00	200.03
02/04/1966	8.5	2	0	2	0.00	27.28	0.00	0.87	12.63	1.18	0.82	10.70	211.55	108315.95	0.00	211.55
03/04/1966	14	0	0	0	0.00	29.47	0.00	0.94	12.66	1.29	0.00	10.70	222.26	113795.40	0.00	222.26
04/04/1966	4.3	0	0	0.00	23.99	0.00	0.81	12.66	0.90	0.00	0.00	10.70	232.96	119274.85	19.69	213.27
05/04/1966	4.8	0	0	0.00	25.38	0.00	0.81	12.73	1.11	0.00	0.00	10.70	223.97	114674.31	19.69	204.29
06/04/1966	3.3	0	0	0.00	21.24	0.00	0.78	12.78	1.04	0.00	0.00	10.70	214.99	110073.76	19.69	195.30
07/04/1966	6.8	0	0	0.00	30.85	0.00	0.84	12.80	1.27	0.00	0.00	10.70	205.00	105473.21	19.69	186.31
08/04/1966	8.8	0	0	0.00	36.33	0.00	1.07	12.83	1.45	0.00	0.00	10.70	197.02	100672.96	0.00	197.02
09/04/1966	8.3	10.8	0	10.8	0.00	29.47	0.00	0.94	12.86	1.28	0.32	10.70	217.04	111124.73	0.00	217.04
10/04/1966	5.8	0	0	0.00	28.10	0.00	0.87	12.90	1.20	0.00	0.00	10.70	227.24	116592.18	0.00	227.24
11/04/1966	3.3	0	0	0.00	21.24	0.00	0.78	12.93	1.06	0.00	0.00	10.70	238.44	122081.63	19.69	218.75
12/04/1966	9.3	0	0	0.00	37.70	0.00	1.15	12.97	1.57	0.00	0.00	10.70	229.46	117481.09	19.69	209.77
13/04/1966	12.5	0	0	0.00	46.48	0.00	1.40	13.00	1.80	0.00	0.00	10.70	220.47	112880.53	19.69	200.78
14/04/1966	12.3	12.2	0	12.2	0.00	43.92	0.00	1.39	13.03	1.81	0.29	10.70	221.78	113549.41	0.00	221.78
15/04/1966	8.5	0	0	0.00	35.81	0.00	1.07	13.07	1.48	0.00	0.00	10.70	232.48	119028.86	0.00	232.48
16/04/1966	10.3	21.8	0	21.8	0.00	40.45	0.00	1.23	13.10	1.89	20.11	10.70	203.29	114504.66	0.00	203.29
17/04/1966	6.5	0	0	0.00	30.02	0.00	0.94	13.14	1.31	0.00	0.00	10.70	213.89	110283.51	0.00	213.89
18/04/1966	7.5	0	0	0.00	32.77	0.00	1.00	13.17	1.40	0.00	0.00	10.70	204.90	105762.96	19.69	205.61
19/04/1966	8.3	19.8	0	19.8	0.00	34.89	0.00	1.07	13.20	1.50	18.10	10.70	205.81	106228.86	0.00	205.81
20/04/1966	8.5	0	0	0.00	35.81	0.00	1.07	13.24	1.50	0.00	0.00	10.70	204.51	105909.11	0.00	204.51
21/04/1966	9.5	0	0	0.00	38.25	0.00	1.15	13.27	1.81	0.00	0.00	10.70	215.21	101388.87	19.69	205.52
22/04/1966	12	0	0	0.00	45.11	0.00	1.40	13.31	1.86	0.00	0.00	10.70	206.23	106748.07	19.69	206.23
23/04/1966	10	0	0	0.00	39.62	0.00	1.23	13.34	1.72	0.00	0.00	10.70	207.24	107187.42	19.69	207.24
24/04/1966	12	0	0	0.00	45.11	0.00	1.40	13.37	1.88	0.00	0.00	10.70	208.26	107586.82	19.69	208.26
25/04/1966	6	0	0	0.00	34.14	0.00	1.07	13.41	1.52	0.00	0.00	10.70	219.27	112986.37	19.69	200.58
26/04/1966	6.5	0	0	0.00	30.02	0.00	0.94	13.44	1.34	0.00	0.00	10.70	220.28	113385.83	19.69	201.59
27/04/1966	4.5	0	0	0.00	23.99	0.00	0.81	13.48	1.18	0.00	0.00	10.70	201.30	108745.28	19.69	201.30
28/04/1966	5.8	0	0	0.00	28.10	0.00	0.87	13.51	1.28	0.00	0.00	10.70	202.31	109144.73	19.69	202.31
29/04/1966	10.5	0	0	0.00	41.00	0.00	1.23	13.55	1.75	0.00	0.00	10.70	213.32	104584.18	19.69	204.84
30/04/1966	14.5	0	0	0.00	51.97	0.00	1.80	13.58	2.25	0.00	0.00	10.70	224.34	100083.63	19.69	214.66
01/05/1966	17.5	0	0	0.00	60.20	0.00	1.84	13.61	2.70	0.00	0.00	10.70	225.36	100583.09	19.69	205.67
02/05/1966	15.6	3.2	0	3.2	0.00	54.71	0.00	1.71	13.65	2.40	0.00	10.70	217.17	111181.07	0.00	217.17
03/05/1966	14.8	0.0	0	0.0	51.87	0.00	1.60	13.68	2.27	0.00	0.00	10.70	227.87	116870.52	0.00	227.87
04/05/1966	14.0	3.4	0	3.4	0.00	52.79	0.00	1.60	13.72	2.27	1.13	10.70	229.71	122129.27	0.00	229.71
05/05/1966	15.5	0	0	0.00	54.71	0.00	1.71	13.76	2.42	0.00	0.00	10.70	230.41	122528.72	0.00	230.41
06/05/1966	15.5	0	0	0.00	54.71	0.00	1.71	13.78	2.43	0.00	0.00	10.70	231.11	122928.17	19.69	211.42
07/05/1966	16.5	1.4	0	1.4	0.00	62.84	0.00	2.08	13.82	2.81	0.00	10.70	232.12	123327.62	0.00	232.12
08/05/1966	16.8	5	0	5	0.00	58.28	0.00	1.82	13.85	2.59	2.41	10.70	233.13	123727.07	0.00	233.13
09/05/1966	18.5	1	0	1	0.00	58.28	0.00	1.82	13.89	2.59	0.00	10.70	234.14	124126.52	0.00	234.14
10/05/1966	19.2	19	0	19	0.00	49.23	0.00	1.60	13.92	2.17	18.83	10.70	203.96	115579.98	0.00	203.96
11/05/1966	14.8	7	0	7	0.00	59.89	0.00	1.82	13.95	2.41	4.80	10.70	214.97	120328.44	0.00	214.97
12/05/1966	15.5	0.4	0	0.4	0.00	54.71	0.00	1.71	13.99	2.46	0.00	10.70	225.98	125127.80	0.00	225.98
13/05/1966	18.5	0	0	0.00	62.84	0.00	2.08	14.02	2.85	0.00	0.00	10.70	236.99	129927.25	19.69	217.30
14/05/1966	19	0	0	0.00	64.31	0.00	2.20	14.06	3.15	0.00	0.00	10.70	238.00	130326.70	19.69	218.31
15/05/1966	20.8	0	0	0.00	66.25	0.00	2.34	14.09	3.24	0.00	0.00	10.70	239.01	130726.15	19.69	219.32
16/05/1966	21.0	0	0	0.00	71.89	0.00	2.49	14.12	3.55	0.00	0.00	10.70	240.02	131125.60	19.69	220.33
17/05/1966	19.5	0	0	0.00	68.86	0.00	2.20	14.16	3.17	0.00	0.00	10.70	241.03	131525.05	19.69	221.34
18/05/1966	18.3	0	0	0.00	62.38	0.00	2.06	14.19	2.99	0.00	0.00	10.70	242.04	131924.50	19.69	222.35
19/05/1966	18.5	0.5	0	0.5	0.00	62.84	0.00	2.08	14.23	3.00	0.00	10.70	243.05	132323.95	0.00	243.05
20/05/1966	19	0	0	0.00	64.31	0.00	2.20	14.26	3.20	0.00	0.00	10.70	244.06	132723.40	0.00	244.06
21/05/1966	13.3	0	0	0.00	48.69	0.00	1.50	14.29	2.73	0.00	0.00	10.70	245.07	133122.85	19.69	225.07
22/05/1966	11.3	0	0	0.00	43.19	0.00	1.31	14.33	1.87	0.00	0.00	10.70	246.08	133522.30	19.69	226.08
23/05/1966	12.5	0	0	0.00	47.30	0.00	1.49	14.38	2.10	0.00	0.00	10.70	247.09	133921.75	19.69	227.09
24/05/1966	18.5	3	0	3	0.00	57.45	0.00	1.82	14.40	2.69	0.51	10.70	248.10	134321.20	0.00	248.10
25/05/1966	17.3	0	0	0.00	50.85	0.00	1.64	14.43	2.87	0.00	0.00	10.70	249.11	134720.65	0.00	249.11
26/05/1966	14.3	0	0	0.00	51.42	0.00	1.60	14.46	2.40	0.00	0.00	10.70	250.12	135120.10	19.69	250.12
27/05/1966	16	0	0	0.00	56.06	0.00	1.82	14.50	2.72	0.00	0.00	10.70	251.13	135519.55	19.69	251.13
28/05/1966	19.8	0	0	0.00	66.61	0.00	2.20	14.53	3.25	0.00	0.00	10.70	252.14	135919.00	19.69	252.14
29/05/1966	21	3	0	3	0.00	69.89	0.00	2.49	14.57	3.67	0.00	10.70	253.15	136318.45	0.00	253.15
30/05/1966	19.5	0	0	0.00	65.88	0.00	2.20	14.60	3.27	2.73	19.79	254.16	136717.90	0.00	254.16	
31/05/1966	18.3	7.8	0	7.8	0.00	65.14	0.00	2.20	14.63	3.28	4.32	10.70	255.17	137117.35	0.00	255.17
01/06/1966	11.5	0	0	0.00	43.74	0.00	1.31	14.67	2.01	0.00	0.00	10.70	256.18	137516.80	0.00	256.18
02/06/1966	17.8	2.8	0	2.8	0.00	61.02	0.00	1.94	14.70	2.82	0.90	10.70	257.19	137916.25	0.00	257.19
03/06/1966	10.3	0	0	0.00	40.45	0.00	1.23	14.74	1.90	0.00	0.00	10.70	258.20	138315.70	0.00	258.20
04/06/1966	10.8	0	0	0.00	41.00	0.00	1.23	14.77	1.81	0.00	0.00	10.70	259.21	138715.15	39.36	307.45
05/06/1966	10.5	0	0	0.00	41.00	0.00	1.23	14.81	1.91	0.00	0.00	10.70	260.22	139114.60	39.36	278.78
06/06/1966	11.8	0	0	0.00	43.74	0.00	1.31	14.84	2.04	0.00	0.00	10.70	261.23	139514.05	39.36	250.11
07/06/1966	11.6	0	0	0.00	44.58	0.00	1.31	14.87	2.04	0.00	0.00	10.70	262.24	139913.50	39.36	221.44
08/06/1966	12.5	0	0	0.00	46.48	0.00	1.40	14.91	2.18	0.00	0.00	10				

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1955-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate ic: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
14000 L/min 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
30/06/1955	22	10.2	0	10.2	0.00	72.54	0.00	2.64	15.04	4.01	8.19	10.70	31.52	16196.01	0.00	31.52
01/07/1955	21.3	0	0	0	0.00	70.62	0.00	2.49	15.01	3.78	0.00	10.70	42.22	21815.47	0.00	42.22
02/07/1955	19.4	0	0	0	0.00	65.86	0.00	2.29	14.97	3.35	0.00	10.70	52.82	27094.92	39.38	13.54
03/07/1955	23.3	0	0	0	0.00	76.11	0.00	2.81	14.94	4.22	0.00	10.70	24.25	12414.37	39.38	0.00
04/07/1955	20	22	0	22	0.00	67.06	0.00	2.34	14.90	3.54	18.46	10.70	29.16	14929.97	0.00	29.16
05/07/1955	20	0	0	0	0.00	67.06	0.00	2.34	14.87	3.53	0.00	10.70	39.86	20406.43	0.00	39.86
06/07/1955	21	5.2	0	5.2	0.00	69.89	0.00	2.49	14.83	3.74	1.46	10.70	62.03	28638.05	0.00	62.03
07/07/1955	19.8	12	0	12	0.00	66.51	0.00	2.29	14.89	3.31	8.89	10.70	71.42	36568.38	0.00	71.42
08/07/1955	23.3	40.2	0	40.2	0.00	78.11	0.00	2.81	14.78	4.17	38.03	10.70	118.15	62495.25	0.00	118.15
09/07/1955	23	1	0	1	0.00	75.28	0.00	2.81	14.73	4.16	0.00	10.70	128.86	69974.70	0.00	128.86
10/07/1955	23	0	0	0	0.00	75.28	0.00	2.81	14.70	4.15	0.00	10.70	139.56	71454.15	0.00	139.56
11/07/1955	18.5	0	0	0	0.00	82.94	0.00	2.08	14.66	3.09	0.00	10.70	150.28	72933.90	39.38	110.89
12/07/1955	22.3	0	0	0	0.00	73.37	0.00	2.64	14.63	3.90	0.00	10.70	121.59	62253.05	39.38	82.21
13/07/1955	22.5	0	0	0	0.00	73.91	0.00	2.64	14.59	3.89	0.00	10.70	82.82	47572.51	39.38	43.44
14/07/1955	24.9	0	0	0	0.00	69.22	0.00	2.89	14.66	4.35	0.00	10.70	84.24	32811.89	39.38	44.87
15/07/1955	24.5	0	0	0	0.00	78.40	0.00	2.99	14.52	4.34	0.00	10.70	59.87	30339.30	39.38	19.30
16/07/1955	25	0	0	0	0.00	80.77	0.00	3.17	14.49	4.59	0.00	10.70	70.70	5479.45	39.38	0.00
17/07/1955	24.3	3	0	3	0.00	78.85	0.00	2.99	14.45	4.32	0.00	10.70	70.70	5479.45	0.00	10.70
18/07/1955	20	0	0	0	0.00	67.06	0.00	2.34	14.42	3.43	0.00	10.70	21.40	10958.80	0.00	21.40
19/07/1955	22	9	0	9	0.00	72.54	0.00	2.64	14.39	3.84	5.16	10.70	37.27	16993.39	0.00	37.27
20/07/1955	24.6	0	0	0	0.00	79.49	0.00	2.99	14.35	4.29	0.00	10.70	47.87	24559.85	0.00	47.87
21/07/1955	25.3	0	0	0	0.00	81.89	0.00	3.17	14.32	4.51	0.00	10.70	59.87	30339.30	39.38	19.30
22/07/1955	24.8	24	0	24	0.00	80.22	0.00	2.99	14.28	4.20	19.74	10.70	49.73	25463.87	0.00	49.73
23/07/1955	22.5	0	0	0	0.00	73.81	0.00	2.64	14.25	3.60	0.00	10.70	60.44	30943.32	0.00	60.44
24/07/1955	18.9	0	0	0	0.00	83.78	0.00	2.08	14.21	2.99	0.00	10.70	71.14	38422.78	39.38	31.76
25/07/1955	19	0	0	0	0.00	84.31	0.00	2.29	14.18	3.18	0.00	10.70	42.47	21742.23	39.38	3.09
26/07/1955	19.8	0	0	0	0.00	69.51	0.00	2.29	14.15	3.19	0.00	10.70	13.79	7961.89	39.38	0.00
27/07/1955	22.3	0	0	0	0.00	73.37	0.00	2.64	14.11	3.75	0.00	10.70	19.79	5479.45	39.38	0.00
28/07/1955	22.8	0.8	0	0.8	0.00	74.74	0.00	2.64	14.08	3.75	0.00	10.70	5479.45	0.00	10.70	
29/07/1955	21.5	0	0	0	0.00	71.17	0.00	2.49	14.04	3.53	0.00	10.70	21.40	10958.80	0.00	21.40
30/07/1955	21.0	0	0	0	0.00	69.89	0.00	2.49	14.01	3.63	0.00	10.70	32.11	16438.36	39.38	0.00
31/07/1955	19.5	0	0	0	0.00	65.68	0.00	2.29	13.97	3.13	0.00	10.70	10.70	5479.45	39.38	0.00
01/08/1955	19	0	0	0	0.00	64.31	0.00	2.29	13.94	3.12	0.00	10.70	5479.45	39.38	0.00	
02/08/1955	20	0	0	0	0.00	67.06	0.00	2.34	13.90	3.30	0.00	10.70	70.70	5479.45	39.38	0.00
03/08/1955	22.5	0	0	0	0.00	73.81	0.00	2.64	13.87	3.70	0.00	10.70	5479.45	39.38	0.00	
04/08/1955	24.3	0	0	0	0.00	78.85	0.00	2.99	13.84	4.14	0.00	10.70	5479.45	39.38	0.00	
05/08/1955	25.3	2	0	2	0.00	81.89	0.00	3.17	13.80	4.36	0.00	10.70	16.70	5479.45	0.00	10.70
06/08/1955	23	0	0	0	0.00	75.28	0.00	2.81	13.77	3.89	0.00	10.70	21.40	10958.80	0.00	21.40
07/08/1955	20	0	0	0	0.00	65.68	0.00	2.29	13.73	2.99	0.00	10.70	32.11	16438.36	39.38	0.00
08/08/1955	17.5	0	0	0	0.00	67.06	0.00	2.34	13.70	2.84	0.00	10.70	10.70	5479.45	39.38	0.00
09/08/1955	27	8	0	8	0.00	87.85	0.00	3.68	13.66	4.84	9.09	10.70	10.70	5479.45	39.38	0.00
10/08/1955	23.5	4.1	0	4.1	0.00	76.66	0.00	2.81	13.63	3.85	2.25	10.70	10.95	5909.29	0.00	10.95
11/08/1955	22.5	0	0	0	0.00	73.81	0.00	2.64	13.59	3.62	0.00	10.70	21.68	11088.71	0.00	21.68
12/08/1955	22.5	0	0	0	0.00	73.81	0.00	2.64	13.56	3.61	0.00	10.70	32.36	16568.16	39.38	0.00
13/08/1955	19.5	0	0	0	0.00	65.68	0.00	2.29	13.53	3.03	0.00	10.70	70.70	5479.45	39.38	0.00
14/08/1955	22	0	0	0	0.00	72.54	0.00	2.64	13.49	3.69	0.00	10.70	70.70	5479.45	39.38	0.00
15/08/1955	24.3	0	0	0	0.00	78.85	0.00	2.99	13.35	4.32	0.00	10.70	5479.45	39.38	0.00	
16/08/1955	23.5	0	0	0	0.00	76.66	0.00	2.81	13.42	3.79	0.00	10.70	70.70	5479.45	39.38	0.00
17/08/1955	23	5.8	0	5.8	0.00	78.20	0.00	2.81	13.39	3.78	2.02	10.70	12.72	6511.21	0.00	12.72
18/08/1955	19	2.8	0	2.8	0.00	64.31	0.00	2.29	13.35	2.99	0.00	10.70	23.42	11990.68	0.00	23.42
19/08/1955	16.3	0	0	0	0.00	58.51	0.00	1.84	13.32	2.49	0.00	10.70	34.12	17470.12	0.00	34.12
20/08/1955	19.5	0	0	0	0.00	65.68	0.00	2.29	13.28	2.87	0.00	10.70	44.82	22949.57	39.38	5.45
21/08/1955	24.3	0	0	0	0.00	78.85	0.00	2.99	13.25	4.32	0.00	10.70	18.15	8709.92	0.00	18.15
22/08/1955	24.8	0	0	0	0.00	80.22	0.00	2.99	13.22	3.84	0.00	10.70	28.85	13748.47	0.00	28.85
23/08/1955	24	0	0	0	0.00	78.03	0.00	2.99	13.18	3.95	0.00	10.70	37.55	19227.92	39.38	0.00
24/08/1955	26.3	0	0	0	0.00	81.89	0.00	3.17	13.15	4.16	0.00	10.70	10.70	5479.45	39.38	0.00
25/08/1955	24.9	0	0	0	0.00	80.22	0.00	2.99	13.11	3.91	0.00	10.70	70.70	5479.45	39.38	0.00
26/08/1955	22.3	0	0	0	0.00	73.37	0.00	2.64	13.09	3.49	0.00	10.70	70.70	5479.45	39.38	0.00
27/08/1955	21.5	0	0	0	0.00	71.17	0.00	2.49	13.04	3.28	0.00	10.70	70.70	5479.45	39.38	0.00
28/08/1955	22.8	2	0	2	0.00	74.74	0.00	2.64	13.01	3.49	0.00	10.70	70.70	5479.45	0.00	10.70
29/08/1955	21.8	0.6	0	0.6	0.00	71.99	0.00	2.49	12.97	3.29	0.00	10.70	21.40	10958.80	0.00	21.40
30/08/1955	20.5	0	0	0	0.00	68.43	0.00	2.34	12.84	3.07	0.00	10.70	32.11	16438.36	0.00	32.11
31/08/1955	19	0	0	0	0.00	64.31	0.00	2.29	12.81	2.89	0.00	10.70	42.81	21817.81	39.38	3.43
01/09/1955	17.8	4	0	4	0.00	61.02	0.00	1.84	12.87	2.55	1.45	10.70	15.58	7977.39	0.00	15.58
02/09/1955	19.8	2.7	0	2.7	0.00	69.51	0.00	2.29	12.84	2.87	0.00	10.70	28.28	13458.81	0.00	28.28
03/09/1955	20	0	0	0	0.00	67.06	0.00	2.34	12.80	3.04	0.00	10.70	39.59	19928.26	0.00	39.59
04/09/1955	19	0	0	0	0.00	64.31	0.00	2.29	12.77	2.86	0.00	10.70	47.89	24415.71	19.69	28.00
05/09/1955	17.3	0	0	0	0.00	58.55	0.00	1.84	12.73	2.53	0.00	10.70	39.70	19915.17	19.69	19.91
06/09/1955	23.8	5.2	0	5.2	0.00	77.48	0.00	2.81	12.70	3.58	1.82	10.70	31.34	16043.78	0.00	31.34
07/09/1955	18	13.2	0	13.2	0.00	61.57	0.00	2.08	12.66	2.68	10.52	10.70	52.56	26911.99	0.00	52.56
08/09/1955	14.3	0	0	0	0.00	51.42	0.00	1.69	12.63	2.09	0.00	10.70	63.28	32391.44	0.00	63.28
09/09/1955	14.3	0	0	0	0.00	51.42	0.00	1.69	12.60	2						

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate I: 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter 14000 L/min
Spring, Fall 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
26/09/1966	19	0	0	0	0.00	56.06	0.00	1.87	11.97	2.24	0.00	10.70	29.21	13420.65	0.00	29.21
28/09/1966	14.3	0	0	0	0.00	51.42	0.00	1.90	11.94	1.98	0.00	10.70	36.91	18900.11	19.69	17.23
30/09/1966	19	5	0	5	0.00	54.31	0.00	2.20	11.91	2.67	2.33	10.70	39.28	15499.79	0.00	39.28
01/10/1966	12.5	0	0	0	0.00	46.48	0.00	1.40	11.87	1.74	0.00	10.70	49.99	20673.24	0.00	49.99
02/10/1966	10	0	0	0	0.00	39.82	0.00	1.23	11.84	1.53	0.00	10.70	51.67	20452.69	19.69	31.68
03/10/1966	10	0	0	0	0.00	39.82	0.00	1.23	11.81	1.53	0.00	10.70	42.68	21852.14	19.69	22.99
04/10/1966	11.5	0	0	0	0.00	43.74	0.00	1.31	11.78	1.82	0.00	10.70	33.99	22251.60	19.69	14.01
05/10/1966	13	0	0	0	0.00	47.65	0.00	1.50	11.75	1.83	0.00	10.70	24.71	22651.09	19.69	5.02
06/10/1966	15.5	0	0	0	0.00	54.71	0.00	1.71	11.72	2.09	0.00	10.70	15.72	30562.60	19.69	0.00
07/10/1966	18	31	0	31	0.00	61.67	0.00	2.06	11.69	2.47	28.53	10.70	39.23	20067.31	0.00	39.23
08/10/1966	11.5	0.4	0	0.4	0.00	43.74	0.00	1.31	11.68	1.60	0.00	10.70	49.24	25506.76	0.00	49.24
09/10/1966	12	0	0	0	0.00	45.11	0.00	1.40	11.63	1.70	0.00	10.70	60.64	31046.21	19.69	40.95
10/10/1966	12.5	0	0	0	0.00	46.48	0.00	1.40	11.60	1.70	0.00	10.70	51.65	28445.67	19.69	31.96
11/10/1966	13	0	0	0	0.00	47.85	0.00	1.50	11.57	1.90	0.00	10.70	42.67	21845.32	19.69	22.98
12/10/1966	13.8	0	0	0	0.00	50.06	0.00	1.60	11.54	1.79	0.00	10.70	33.68	22441.17	19.69	13.99
13/10/1966	14.8	3.4	0	3.4	0.00	52.79	0.00	1.69	11.50	1.80	1.50	10.70	28.19	13410.56	0.00	28.19
14/10/1966	9.3	0	0	0	0.00	37.70	0.00	1.15	11.47	1.39	0.00	10.70	36.89	18909.02	0.00	36.89
15/10/1966	10.6	0	0	0	0.00	41.00	0.00	1.23	11.44	1.48	0.00	10.70	47.60	24399.47	19.69	27.91
16/10/1966	11.5	0	0	0	0.00	43.74	0.00	1.31	11.41	1.67	0.00	10.70	38.61	19759.92	19.69	19.92
17/10/1966	15.5	0	0	0	0.00	64.71	0.00	1.71	11.39	2.00	0.00	10.70	29.63	15168.37	19.69	9.94
18/10/1966	18.6	5.8	0	5.8	0.00	62.94	0.00	2.08	11.35	2.39	3.21	10.70	23.85	12209.89	0.00	23.85
19/10/1966	14.3	0	0	0	0.00	51.42	0.00	1.90	11.32	1.88	0.00	10.70	34.55	17689.14	0.00	34.55
20/10/1966	10	0.3	0	0.3	0.00	39.82	0.00	1.23	11.29	1.48	0.00	10.70	45.25	23168.58	19.69	25.56
21/10/1966	8	0	0	0	0.00	34.14	0.00	1.07	11.28	1.28	0.00	10.70	36.27	19588.04	19.69	16.58
22/10/1966	7	0	0	0	0.00	31.39	0.00	1.00	11.23	1.20	0.00	10.70	27.28	13967.50	19.69	7.59
23/10/1966	9	0	0	0	0.00	36.88	0.00	1.15	11.20	1.38	0.00	10.70	18.29	8998.85	19.69	0.00
24/10/1966	14.5	0	0	0	0.00	51.97	0.00	1.60	11.19	1.83	0.00	10.70	10.70	5479.45	19.69	0.00
25/10/1966	13	0	0	0	0.00	47.85	0.00	1.50	11.17	1.74	0.00	10.70	19.70	5479.45	19.69	0.00
26/10/1966	13	0	0	0	0.00	47.85	0.00	1.50	11.10	1.73	0.00	10.70	10.70	5479.45	19.69	0.00
27/10/1966	14.5	0	0	0	0.00	51.97	0.00	1.60	11.07	1.83	0.00	10.70	10.70	5479.45	19.69	0.00
28/10/1966	14.8	3.8	0	3.8	0.00	52.79	0.00	1.60	11.04	1.83	1.77	10.70	12.48	6387.59	0.00	12.48
29/10/1966	8	0	0	0	0.00	34.14	0.00	1.07	11.01	1.25	0.00	10.70	23.18	11867.04	0.00	23.18
30/10/1966	6	0	0	0	0.00	34.14	0.00	1.07	10.98	1.23	0.00	10.70	33.88	12449.48	19.69	14.19
31/10/1966	9.3	0	0	0	0.00	34.86	0.00	1.07	10.95	1.24	0.00	10.70	24.99	12445.84	19.69	0.00
01/11/1966	7.8	0	0	0	0.00	33.59	0.00	1.00	10.92	1.19	0.00	10.70	15.81	8145.39	19.69	0.00
02/11/1966	5	0	0	0	0.00	25.81	0.00	0.87	10.89	1.02	0.00	10.70	10.70	5479.45	19.69	0.00
03/11/1966	4.5	0	0	0	0.00	24.84	0.00	0.81	10.86	0.95	0.00	10.70	10.70	5479.45	19.69	0.00
04/11/1966	1.5	0	0	0	0.00	16.21	0.00	0.66	10.83	0.77	0.00	10.70	10.70	5479.45	19.69	0.00
05/11/1966	3	0	0	0	0.00	20.42	0.00	0.78	10.79	0.85	0.00	10.70	10.70	5479.45	19.69	0.00
06/11/1966	3	0	0	0	0.00	21.24	0.00	0.78	10.75	0.88	0.00	10.70	10.70	5479.45	19.69	0.00
07/11/1966	6	0	0	0	0.00	25.81	0.00	0.87	10.73	1.00	0.00	10.70	19.70	5479.45	19.69	0.00
08/11/1966	4	2	0	2	0.00	23.16	0.00	0.81	10.70	0.94	1.08	10.70	11.77	6024.54	0.00	11.77
09/11/1966	6	3.2	0	3.2	0.00	28.65	0.00	0.84	10.67	1.08	2.14	10.70	24.90	12397.14	0.00	24.90
10/11/1966	9.9	13.2	0	13.2	0.00	39.08	0.00	1.15	10.64	1.29	11.91	10.70	47.22	24176.42	0.00	47.22
11/11/1966	6	2.4	0	2.4	0.00	28.65	0.00	0.84	10.61	1.08	1.34	10.70	59.29	30242.66	0.00	59.29
12/11/1966	6	0	0	0	0.00	28.65	0.00	0.84	10.58	1.09	0.00	10.70	69.89	33822.09	0.00	69.89
13/11/1966	9.9	0	0	0	0.00	34.14	0.00	1.07	10.55	1.20	0.00	10.70	80.87	41911.48	19.69	60.89
14/11/1966	8	0	0	0	0.00	34.14	0.00	1.07	10.52	1.20	0.00	10.70	71.88	36709.93	19.69	51.99
15/11/1966	7	0	0	0	0.00	31.39	0.00	1.00	10.49	1.12	0.00	10.70	62.70	32109.38	19.69	43.01
16/11/1966	6.3	7.3	0	7.3	0.00	26.73	0.00	0.87	10.46	0.98	6.32	10.70	60.04	30738.00	0.00	60.04
17/11/1966	2.8	0.4	0	0.4	0.00	19.67	0.00	0.71	10.42	0.79	0.00	10.70	70.74	38217.45	0.00	70.74
18/11/1966	3.8	0	0	0	0.00	22.82	0.00	0.78	10.39	0.85	0.00	10.70	81.44	41996.91	19.69	81.78
19/11/1966	6	0	0	0	0.00	34.14	0.00	1.07	10.36	1.19	0.00	10.70	72.45	37998.86	19.69	52.77
20/11/1966	6.3	0	0	0	0.00	26.73	0.00	0.87	10.33	0.98	0.00	10.70	63.47	32495.81	19.69	43.78
21/11/1966	5	0	0	0	0.00	28.10	0.00	0.87	10.30	0.95	0.00	10.70	54.48	27895.26	19.69	34.80
22/11/1966	3	0	0	0	0.00	20.42	0.00	0.78	10.27	0.84	0.00	10.70	45.50	23294.71	19.69	25.81
23/11/1966	11	0	0	0	0.00	42.37	0.00	1.31	10.24	1.41	0.00	10.70	36.51	18994.17	19.69	18.82
24/11/1966	7.3	0	0	0	0.00	32.22	0.00	1.00	10.21	1.09	0.00	10.70	27.65	14093.62	19.69	7.84
25/11/1966	4.5	0	0	0	0.00	24.84	0.00	0.81	10.18	0.89	5.11	10.70	23.99	12110.45	0.00	23.99
26/11/1966	7	0	0	0	0.00	31.39	0.00	1.00	10.15	1.08	0.00	10.70	34.36	17689.99	0.00	34.36
27/11/1966	5	0	0	0	0.00	25.81	0.00	0.87	10.12	0.94	0.00	10.70	45.09	23099.35	19.69	25.37
28/11/1966	7.5	0	0	0	0.00	32.77	0.00	1.00	10.09	1.07	0.00	10.70	39.07	18488.81	19.69	18.36
29/11/1966	10.3	0	0	0	0.00	40.45	0.00	1.23	10.05	1.30	0.00	10.70	27.09	13899.26	19.69	7.40
30/11/1966	13.6	12	0	12	0.00	48.23	0.00	1.50	10.02	1.68	10.44	10.70	28.84	14613.68	0.00	28.84
01/12/1966	7.8	0	0	0	0.00	32.77	0.00	1.00	9.99	1.08	0.00	10.70	39.24	20992.62	0.00	39.24
02/12/1966	9.8	0	0	0	0.00	39.69	0.00	1.15	9.95	1.20	0.00	10.70	49.82	25511.07	39.38	10.57
03/12/1966	11	0	0	0	0.00	42.37	0.00	1.31	9.93	1.37	0.00	10.70	21.27	10891.42	39.38	0.00
04/12/1966	12	2	0	2	0.00	45.11	0.00	1.40	9.90	1.45	0.55	10.70	11.25	5780.62	0.00	11.23
05/12/1966	9.5	1	0	1	0.00	38.25	0.00	1.15	9.87	1.19	0.00	10.70	21.95	11240.07	0.00	21.95
06/12/1966	12	1	0	1	0.00	45.11	0.00	1.40	9.84	1.44	0.00	10.70	32.66	18719.53	0.00	32.66
07/12/1966	6.5	0	0	0	0.00	30.02	0.00	0.94	9.81	0.98	0.00	10.70	43.38	22189.88	0.00	43.38
08/12/1966	2.8	0	0	0	0.00	19.65	0.00	0.71	9.78	0.79	0.00	10				

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate Ic: 6136608
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter Spring, Fall
14000 L/min 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
01/01/1972	-6.8	2.5	0	2.5	17.80	0.00	0.00	0.58	9.07	0.58	1.92	10.70	440.43	224296.83	0.00	440.43
02/01/1972	-7.7	2.8	0	2.8	17.80	0.00	0.00	0.58	9.11	0.83	19.01	10.70	425.14	240239.46	0.00	425.14
03/01/1972	3.8	0	0	0	0.00	0.00	0.00	0.92	10.25	0.21	0.00	10.70	480.84	248188.94	0.00	480.84
04/01/1972	-0.3	0	12.2	12.2	13.14	0.00	0.00	0.58	9.19	0.58	0.00	10.70	481.54	251888.39	0.00	481.54
05/01/1972	-8.1	0	5.8	5.8	18.84	0.00	0.00	0.38	9.23	0.46	0.00	10.70	452.87	239877.84	0.00	452.87
06/01/1972	-7.2	0	8.0	8.0	27.84	0.00	0.00	0.41	9.27	0.43	0.00	10.70	434.19	222307.30	0.00	434.19
07/01/1972	0	0	0	0	27.84	0.00	0.00	0.61	9.31	0.82	0.00	10.70	403.52	207926.75	0.00	403.52
08/01/1972	-0.8	1.3	0	1.3	27.84	0.00	0.00	0.58	9.35	0.89	0.71	10.70	377.85	193307.28	0.00	377.85
09/01/1972	1.6	0.8	0	0.8	17.84	17.46	17.46	0.85	9.39	0.87	12.54	10.70	403.79	202783.81	0.00	403.79
10/01/1972	4.2	0	0	0	16.14	23.71	10.14	0.81	9.43	0.82	9.34	10.70	425.83	218015.10	0.00	425.83
11/01/1972	2.3	0	0	0	0.00	18.92	0.00	0.71	9.47	0.72	0.00	10.70	438.51	223494.64	0.00	438.51
12/01/1972	3.8	0	0	0	0.00	22.89	0.00	0.78	9.51	0.77	0.00	10.70	447.22	226974.09	0.00	447.22
13/01/1972	3.9	1.3	3.8	5.1	3.80	22.89	3.80	0.78	9.55	0.79	4.32	10.70	422.86	216500.25	0.00	422.86
14/01/1972	-5.2	0	1.3	1.3	1.30	0.00	0.00	0.44	9.59	0.47	0.00	10.70	433.87	221985.80	0.00	433.87
15/01/1972	-19.1	0	0	0	1.30	0.00	0.00	0.27	9.62	0.19	0.00	10.70	444.27	227469.25	0.00	444.27
16/01/1972	-12.8	0	1	1	2.30	0.00	0.00	0.23	9.67	0.27	0.00	10.70	413.00	212784.71	0.00	413.00
17/01/1972	-4.2	0	0	0	2.30	0.00	0.00	0.50	9.70	0.53	0.00	10.70	399.52	198104.16	0.00	399.52
18/01/1972	2.8	0.8	0	0.8	2.30	18.87	2.30	0.71	9.74	0.74	2.08	10.70	380.21	184470.88	0.00	380.21
19/01/1972	1.4	0	1	1	1.00	18.87	1.00	0.88	9.78	0.70	0.30	10.70	371.31	180131.14	0.00	371.31
20/01/1972	-5.8	5.1	2	7.1	2.00	0.00	0.00	0.59	9.82	0.60	4.47	10.70	389.46	192861.55	0.00	389.46
21/01/1972	-2.8	0	0	0	2.00	0.00	0.00	0.85	9.86	0.80	0.00	10.70	387.18	200861.21	0.00	387.18
22/01/1972	-5.2	5.3	0	5.3	2.00	0.00	0.00	0.58	9.90	0.60	4.87	10.70	412.96	211231.81	0.00	412.96
23/01/1972	1.1	0	4.3	4.3	3.30	18.21	3.30	0.86	9.94	0.71	5.99	10.70	428.81	219573.45	0.00	428.81
24/01/1972	2.6	0	3.3	3.3	3.30	18.05	3.30	0.71	9.98	0.70	2.84	10.70	462.09	228282.41	0.00	462.09
25/01/1972	-7	0	0	0	0.00	0.00	0.00	0.44	10.02	0.49	0.00	10.70	452.80	231821.87	0.00	452.80
26/01/1972	-12.8	0	0	0	0.00	0.00	0.00	0.25	10.06	0.29	0.00	10.70	463.50	237211.32	0.00	463.50
27/01/1972	-9.7	0	0	0	0.00	0.00	0.00	0.29	10.10	0.32	0.00	10.70	454.81	242830.77	0.00	454.81
28/01/1972	-3.1	0	0	0	0.00	0.00	0.00	0.38	10.14	0.43	0.00	10.70	466.15	249569.22	0.00	466.15
29/01/1972	-10.3	0	0.8	0.8	11.00	0.00	0.00	0.27	10.18	0.32	0.00	10.70	377.48	193296.87	0.00	377.48
30/01/1972	-8.2	0	0	0	11.00	0.00	0.00	0.29	10.22	0.33	0.00	10.70	248.81	178889.53	0.00	248.81
31/01/1972	-6.8	0	1.8	1.8	12.80	0.00	0.00	0.38	10.26	0.44	0.00	10.70	220.13	169908.98	0.00	220.13
01/02/1972	-8.4	0	0	0	12.80	0.00	0.00	0.44	10.30	0.50	0.00	10.70	201.46	149228.05	0.00	201.46
02/02/1972	-3	0	1	1	13.80	0.00	0.00	0.18	10.34	0.85	0.00	10.70	252.79	134547.48	0.00	252.79
03/02/1972	1.1	4.3	1.8	6.1	15.21	15.10	0.00	0.06	10.38	0.74	18.99	10.70	214.77	128432.30	0.00	214.77
04/02/1972	-6.7	0	1.8	1.8	1.80	0.00	0.00	0.44	10.42	0.51	0.00	10.70	202.48	134989.75	0.00	202.48
05/02/1972	-10.6	0	5.3	5.3	6.80	0.00	0.00	0.27	10.46	0.32	0.00	10.70	274.18	140378.20	0.00	274.18
06/02/1972	-7.8	0	0.8	0.8	12.80	0.00	0.00	0.41	10.50	0.48	0.00	10.70	243.51	128998.83	0.00	243.51
07/02/1972	-11.7	0	0	0	12.80	0.00	0.00	0.26	10.54	0.21	0.00	10.70	218.83	111018.10	0.00	218.83
08/02/1972	-12.3	0	0	0	12.80	0.00	0.00	0.25	10.58	0.26	0.00	10.70	185.16	96377.88	0.00	185.16
09/02/1972	-10.9	0	0	0	12.80	0.00	0.00	0.27	10.62	0.32	0.00	10.70	176.46	87170.41	0.00	176.46
10/02/1972	-10	0	0	0	12.80	0.00	0.00	0.29	10.66	0.35	0.00	10.70	150.81	69976.46	0.00	150.81
11/02/1972	-9.5	0	0	0	12.80	0.00	0.00	0.29	10.70	0.35	0.00	10.70	102.14	52295.81	0.00	102.14
12/02/1972	-2.8	0	0	0	12.80	0.00	0.00	0.32	10.74	0.35	0.00	10.70	73.47	37815.38	0.00	73.47
13/02/1972	0	16.9	18.3	35.2	28.70	0.00	0.00	0.81	10.78	0.72	13.78	10.70	58.58	28991.55	0.00	58.58
14/02/1972	1.7	0	0	0	28.70	16.98	16.98	0.88	10.82	0.77	16.08	10.70	85.28	43765.98	0.00	85.28
15/02/1972	1.1	2.8	0	2.8	11.84	15.21	11.84	0.88	10.86	0.78	12.87	10.70	108.93	54285.13	0.00	108.93
16/02/1972	-4.8	0	0	0	0.00	0.00	0.00	0.59	10.90	0.60	0.00	10.70	120.84	61785.98	0.00	120.84
17/02/1972	-6.5	0	0	0	0.00	0.00	0.00	0.60	10.94	0.60	0.00	10.70	131.34	67245.43	0.00	131.34
18/02/1972	-1.1	0.8	4.8	5.6	4.80	0.00	0.00	0.58	10.98	0.70	9.18	10.70	192.77	92818.55	0.00	192.77
19/02/1972	-3.3	0	33.5	33.5	38.30	0.00	0.00	0.52	11.02	0.84	0.00	10.70	113.47	58895.80	0.00	113.47
20/02/1972	-11.7	0	1.8	1.8	38.80	0.00	0.00	0.26	11.06	0.33	0.00	10.70	124.17	63575.00	0.00	124.17
21/02/1972	-6.8	0	0	0	38.80	0.00	0.00	0.44	11.10	0.54	1.49	10.70	86.95	49946.27	0.00	86.95
22/02/1972	-10.1	0	0	0	38.80	0.00	0.00	0.27	11.14	0.35	0.00	10.70	59.86	30189.72	0.00	59.86
23/02/1972	-7.3	0	2.5	2.5	42.30	0.00	0.00	0.41	11.18	0.51	0.00	10.70	118.30	60589.17	0.00	118.30
24/02/1972	-2	0	1.8	1.8	44.18	0.00	0.00	0.58	11.22	0.72	0.00	10.70	86.88	49818.83	0.00	86.88
25/02/1972	-4.8	0	5.1	5.1	49.20	0.00	0.00	0.50	11.26	0.82	0.00	10.70	81.01	43288.08	0.00	81.01
26/02/1972	-2.8	0	0	0	49.20	0.00	0.00	0.55	11.30	0.89	0.00	10.70	32.34	16537.53	0.00	32.34
27/02/1972	-4.5	0	1.8	1.8	51.00	0.00	0.00	0.59	11.34	0.92	0.00	10.70	19.70	9476.45	0.00	19.70
28/02/1972	0.8	0	0	0	51.00	0.00	0.00	0.81	11.38	0.78	0.00	10.70	16.70	8476.45	0.00	16.70
29/02/1972	-4.2	0	0	0	51.00	23.71	23.71	0.61	11.42	1.00	22.72	10.70	32.42	17119.09	0.00	32.42
01/03/1972	4.2	34	0	34	27.29	23.71	23.71	0.61	11.46	1.00	58.71	10.70	100.83	51620.39	0.00	100.83
02/03/1972	-1.7	8.9	2.3	9.1	8.87	0.00	0.00	0.58	11.50	0.79	6.17	10.70	117.75	60282.57	0.00	117.75
03/03/1972	-6.7	0	0	0	8.87	0.00	0.00	0.38	11.54	0.50	0.00	10.70	128.40	65742.63	0.00	128.40
04/03/1972	-6.4	0	4.1	4.1	10.47	0.00	0.00	0.44	11.58	0.67	0.00	10.70	199.19	71241.48	0.00	199.19
05/03/1972	-6.4	0	3	3	13.47	0.00	0.00	0.44	11.62	0.67	0.00	10.70	150.12	88820.83	0.00	150.12
06/03/1972	-6.5	0	5.1	5.1	18.17	0.00	0.00	0.60	11.66	0.84	0.00	10.70	121.13	62020.38	0.00	121.13
07/03/1972	-0.3	7.4	0.8	7.9	18.07	0.00	0.00	0.58	11.70	0.74	8.86	10.70	118.80	60628.00	0.00	118.80
08/03/1972	-6.7	0	0	0	18.07	0.00	0.00	0.44	11.74	0.56	0.00	10.70	129.51	66307.45	0.00	129.51
09/03/1972	-8.9	0	0	0	18.07	0.00	0.00	0.38	11.78	0.51	0.00	10.70	140.21	71789.81	0.00	140.21
10/03/1972	-0.7	0	0	0	18.07	0.00	0.00	0.44	11.82	0.56	0.00	10.70	151.22	87189.26	0.00	151.22

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.88
Longitude: -79.25
Elevation: 175.3
Climate k: 6136606
WMO Identifier:
TC Identifier:

Max. Allowable Release: Summer, Winter 14000 L/min 0.125 m³/s
Spring, Fall 7000 L/min 0.0625 m³/s
39.36 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowfall (mm)	Actual Snowfall (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
31/03/1972	1.4	0	0	0	0.00	18.03	0.00	0.99	12.59	0.90	0.00	10.70	243.78	124813.74	18.89	234.09
01/04/1972	3.8	3.8	0	3.8	0.00	22.89	0.00	0.78	12.83	1.03	2.87	10.70	237.38	121529.44	0.00	237.38
02/04/1972	0.8	0	0	0	0.00	0.00	0.00	0.91	12.86	0.84	0.00	10.70	243.09	127009.89	0.00	243.09
03/04/1972	0.8	0	0	0	0.00	0.00	0.00	0.91	12.86	0.84	0.00	10.70	243.52	124532.92	0.00	243.52
04/04/1972	1.7	0	0.5	0.5	0.50	18.86	0.50	0.86	12.73	0.81	0.00	10.70	274.22	140403.07	0.00	274.22
05/04/1972	-0.8	0	0	0	0.00	0.00	0.00	0.58	12.78	0.81	0.00	10.70	284.93	145882.62	0.00	284.93
06/04/1972	-2	0	7.1	7.1	7.10	0.00	0.00	0.58	12.80	0.82	0.00	10.70	295.63	151381.67	18.89	275.84
07/04/1972	-5.4	0	0	0	7.10	0.00	0.00	0.44	12.83	0.83	0.00	10.70	286.84	148781.42	18.89	286.84
08/04/1972	-6.3	0	0	0	7.10	0.00	0.00	0.47	12.85	0.87	0.00	10.70	277.69	149180.89	18.89	277.69
09/04/1972	-3.6	0	0	0	7.10	0.00	0.00	0.52	12.89	0.75	0.00	10.70	269.87	137560.33	18.89	248.99
10/04/1972	1.7	0	0	0	7.10	18.86	7.10	0.86	12.83	0.82	6.18	10.70	265.87	130123.41	0.00	265.87
11/04/1972	4.8	0	0	0	0.00	25.38	0.00	0.81	12.87	1.13	0.00	10.70	276.57	141802.86	0.00	276.57
12/04/1972	7.2	10.4	0	10.4	0.00	31.84	0.00	1.09	13.09	1.38	0.00	10.70	286.28	151898.31	0.00	286.28
13/04/1972	7.5	0.3	0	0.3	0.00	32.77	0.00	1.09	13.09	1.39	0.00	10.70	306.89	157177.76	0.00	306.89
14/04/1972	6.7	5.8	0	5.8	0.00	30.87	0.00	0.94	13.07	1.30	4.90	10.70	324.18	164680.76	0.00	324.18
15/04/1972	10.3	0.8	0	0.8	0.00	29.73	0.00	0.87	13.31	1.24	0.00	10.70	338.00	171835.89	0.00	338.00
16/04/1972	3.8	24.8	0	24.8	0.00	22.07	0.00	0.78	13.14	1.07	23.53	10.70	367.12	187965.86	0.00	367.12
17/04/1972	4.2	0	0	0	0.00	23.71	0.00	0.81	13.17	1.15	0.00	10.70	377.82	193445.44	0.00	377.82
18/04/1972	9.2	0	0	0	0.00	37.43	0.00	1.15	13.20	1.80	0.00	10.70	388.53	199824.89	18.89	369.64
19/04/1972	9.4	28.4	0	28.4	0.00	37.86	0.00	1.15	13.24	1.80	28.80	10.70	408.34	208444.00	0.00	408.34
20/04/1972	6.7	0	0	0	0.00	30.87	0.00	0.94	13.27	1.32	0.00	10.70	417.04	213524.05	0.00	417.04
21/04/1972	3.3	1.6	0	1.6	0.00	29.73	0.00	0.87	13.31	1.24	0.00	10.70	438.00	218135.89	0.00	438.00
22/04/1972	2.6	3.8	0	3.8	0.00	25.81	0.00	0.87	13.34	1.24	0.00	10.70	448.78	224689.33	0.00	448.78
23/04/1972	5	0	0	0	0.00	25.81	0.00	0.87	13.37	1.25	0.00	10.70	451.48	231147.79	0.00	451.48
24/04/1972	4.2	0.6	0	0.6	0.00	23.71	0.00	0.81	13.41	1.17	0.00	10.70	462.18	236827.24	0.00	462.18
25/04/1972	3.1	0	0	0	0.00	20.70	0.00	0.78	13.44	1.10	0.00	10.70	472.88	242105.89	0.00	472.88
26/04/1972	2.8	0	0	0	0.00	18.87	0.00	0.71	13.46	1.03	0.00	10.70	483.57	247586.14	18.89	464.68
27/04/1972	2.7	0	0	0	0.00	23.09	0.00	0.81	13.51	1.18	0.00	10.70	474.88	248893.59	18.89	455.99
28/04/1972	2.8	0	0	0	0.00	23.81	0.00	0.87	13.55	1.27	0.00	10.70	465.89	248395.16	18.89	446.91
29/04/1972	8.1	0	0	0	0.00	34.41	0.00	1.07	13.56	1.54	0.00	10.70	456.81	233784.50	18.89	437.92
30/04/1972	11.4	0	0	0	0.00	43.46	0.00	1.31	13.81	1.87	0.00	10.70	447.82	229183.85	18.89	428.93
01/05/1972	12.3	13.2	0	13.2	0.00	45.83	0.00	1.49	13.85	2.00	11.20	10.70	449.84	230316.88	0.00	449.84
02/05/1972	13.1	6.6	0	6.6	0.00	46.13	0.00	1.50	13.86	2.13	4.47	10.70	463.01	234805.80	0.00	463.01
03/05/1972	9.7	0	0	0	0.00	38.89	0.00	1.15	13.72	1.88	0.00	10.70	475.71	243565.33	0.00	475.71
04/05/1972	1.6	-4.1	0	-4.1	0.00	32.77	0.00	1.09	13.75	1.48	-2.84	10.70	489.05	250995.16	0.00	489.05
05/05/1972	6.4	0	0	0	0.00	35.72	0.00	1.07	13.78	1.87	0.00	10.70	499.78	255874.80	0.00	499.78
06/05/1972	9.8	3.3	0	3.3	0.00	36.06	0.00	1.15	13.82	1.87	1.83	10.70	512.09	262188.44	0.00	512.09
07/05/1972	5.1	4.1	0	4.1	0.00	28.83	0.00	0.94	13.85	1.38	2.72	10.70	525.51	269090.80	0.00	525.51
08/05/1972	7	11.4	0	11.4	0.00	31.39	0.00	1.09	13.89	1.48	9.82	10.70	546.13	278616.23	0.00	546.13
09/05/1972	10	0	0	0	0.00	39.82	0.00	1.29	13.92	1.89	0.00	10.70	558.83	285087.68	0.00	558.83
10/05/1972	7.8	0	0	0	0.00	33.59	0.00	1.09	13.95	1.48	0.00	10.70	562.55	289577.13	18.89	543.66
11/05/1972	11.4	0	0	0	0.00	33.59	0.00	1.31	13.89	1.82	0.00	10.70	555.85	285076.86	18.89	536.86
12/05/1972	9.8	0	0	0	0.00	39.08	0.00	1.15	14.02	1.70	0.00	10.70	549.56	281376.03	18.89	530.68
13/05/1972	15.9	4.6	0	4.6	0.00	55.81	0.00	1.71	14.06	2.47	2.13	10.70	542.71	277885.75	0.00	542.71
14/05/1972	13.9	0.3	0	0.3	0.00	60.32	0.00	1.50	14.09	2.19	0.00	10.70	533.41	283345.20	0.00	533.41
15/05/1972	13.1	4.3	0	4.3	0.00	46.13	0.00	1.50	14.12	2.20	2.10	10.70	568.21	288899.30	0.00	568.21
16/05/1972	11.7	0.8	0	0.8	0.00	44.29	0.00	1.31	14.16	1.84	0.00	10.70	576.81	293376.76	0.00	576.81
17/05/1972	11.1	3.8	0	3.8	0.00	42.84	0.00	1.31	14.19	1.85	1.85	10.70	586.48	291854.92	0.00	586.48
18/05/1972	13.9	0	0	0	0.00	59.32	0.00	1.50	14.23	2.21	0.00	10.70	600.18	307284.05	0.00	600.18
19/05/1972	17.8	0	0	0	0.00	81.02	0.00	1.94	14.28	2.83	0.00	10.70	610.87	312783.60	18.89	591.98
20/05/1972	15.9	0	0	0	0.00	65.81	0.00	1.71	14.29	2.51	0.00	10.70	601.88	308182.95	18.89	582.99
21/05/1972	13.1	0	0	0	0.00	46.13	0.00	1.50	14.33	2.23	0.00	10.70	592.80	303562.40	18.89	573.91
22/05/1972	18.7	0	0	0	0.00	63.49	0.00	2.08	14.36	3.03	0.00	10.70	583.81	298981.96	18.89	564.92
23/05/1972	16.7	0	0	0	0.00	58.00	0.00	1.82	14.40	2.89	0.00	10.70	574.82	294381.31	18.89	555.93
24/05/1972	19.4	0	0	0	0.00	65.86	0.00	2.20	14.43	3.23	0.00	10.70	565.84	289780.76	18.89	546.94
25/05/1972	17.2	0	0	0	0.00	59.38	0.00	1.84	14.46	2.88	0.00	10.70	556.85	285180.21	18.89	537.95
26/05/1972	17.5	0	0	0	0.00	60.20	0.00	1.84	14.50	2.88	0.00	10.70	547.87	280579.66	18.89	528.96
27/05/1972	17.8	0	0	0	0.00	61.02	0.00	1.84	14.53	2.88	0.00	10.70	538.88	275979.12	18.89	519.97
28/05/1972	18.1	0	0	0	0.00	61.84	0.00	2.08	14.57	3.08	0.00	10.70	530.00	271388.67	18.89	510.98
29/05/1972	19.2	4.3	0	4.3	0.00	64.86	0.00	2.20	14.60	3.27	1.03	10.70	522.04	267288.12	0.00	522.04
30/05/1972	17.5	32.5	0	32.5	0.00	60.20	0.00	1.84	14.63	2.81	29.59	10.70	563.34	287816.61	0.00	563.34
31/05/1972	13.9	12.2	0	12.2	0.00	59.32	0.00	1.50	14.67	2.28	9.82	10.70	582.96	288475.29	0.00	582.96
01/06/1972	9.2	2	0	2	0.00	37.43	0.00	1.15	14.70	1.78	0.22	10.70	593.88	304088.80	0.00	593.88
02/06/1972	12.2	0	0	0	0.00	45.89	0.00	1.49	14.74	2.18	0.00	10.70	604.88	309546.25	0.00	604.88
03/06/1972	14.7	3.8	0	3.8	0.00	52.82	0.00	1.69	14.77	2.44	1.36	10.70	616.84	315719.89	0.00	616.84
04/06/1972	17.8	0	0	0	0.00	61.02	0.00	1.94	14.81	2.84	0.00	10.70	627.84	321199.41	0.00	627.84
05/06/1972	17	0	0	0	0.00	58.83	0.00	1.84	14.84	2.85	0.00	10.70	638.84	326708.89	39.36	599.47
06/06/1972	18.4	0	0	0	0.00	57.18	0.00	1.82	14.87	2.78	0.00	10.70	609.37	311998.31	39.36	570.00
07/06/1972	18.4	0	0	0	0.00	57.18	0.00	1.82	14.81	2.78	0.00	10.70	580.70	297317.77	39.36	541.32
08/06/1972	15.9	0	0	0	0.00	54.89	0.00	1.								

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province: ONTARIO
Latitude: 42.80
Longitude: -79.25
Elevation: 175.3
Climate I: 6136608
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
14000 L/min 7000 L/min
0.125 m³/s 0.0625 m³/s
39.36 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
2006/12/22	20.6	18.8	0	18.8	0.00	88.70	0.00	2.34	16.04	3.57	18.23	10.70	407.17	208488.56	0.00	407.17
3006/12/22	17.8	7.1	0	7.1	0.00	81.02	0.00	1.94	15.91	2.88	4.12	10.70	421.99	218958.45	0.00	421.99
01/07/12/22	17.5	0	0	0	0.00	80.20	0.00	1.84	14.87	2.87	0.00	10.70	452.69	221537.81	0.00	452.69
02/07/12/22	21.7	4.6	0	4.6	0.00	71.72	0.00	2.49	14.64	3.75	2.85	10.70	444.24	227450.99	0.00	444.24
03/07/12/22	23.3	6.8	0	6.8	0.00	54.18	0.00	1.71	14.90	2.82	2.89	10.70	457.92	234453.32	0.00	457.92
04/07/12/22	14.5	0	0	0	0.00	51.87	0.00	1.80	14.87	2.48	0.00	10.70	468.82	239932.77	0.00	468.82
05/07/12/22	15.3	3.8	0	3.8	0.00	54.18	0.00	1.71	14.83	2.81	1.19	10.70	480.51	246020.12	0.00	480.51
06/07/12/22	16.4	0	0	0	0.00	57.18	0.00	1.82	14.80	2.77	0.00	10.70	481.21	251499.97	0.00	481.21
07/07/12/22	17	0	0	0	0.00	59.83	0.00	1.84	14.79	2.84	0.00	10.70	501.81	259079.02	39.36	462.44
08/07/12/22	18.4	0	0	0	0.00	62.87	0.00	2.09	14.79	3.11	0.00	10.70	479.24	262209.47	39.36	439.88
09/07/12/22	20.3	7.1	0	7.1	0.00	67.68	0.00	2.34	14.70	3.49	3.81	10.70	448.10	229495.61	0.00	448.10
10/07/12/22	19.5	0	0	0	0.00	65.68	0.00	2.20	14.68	3.28	0.00	10.70	458.88	234946.06	0.00	458.88
11/07/12/22	21.4	0	0	0	0.00	70.80	0.00	2.49	14.63	3.88	0.00	10.70	469.58	240425.81	39.36	430.21
12/07/12/22	21.5	0	0	0	0.00	66.77	0.00	3.17	14.59	4.82	0.00	10.70	440.91	225744.87	39.36	401.55
13/07/12/22	22.8	0	0	0	0.00	74.74	0.00	2.84	14.56	3.89	0.00	10.70	412.24	211984.42	39.36	372.88
14/07/12/22	22.2	0	0	0	0.00	73.09	0.00	2.64	14.52	3.87	0.00	10.70	381.59	195553.87	39.36	342.19
15/07/12/22	23.4	7.8	0	7.8	0.00	78.36	0.00	2.81	14.49	4.59	3.81	10.70	358.70	183653.86	0.00	358.70
16/07/12/22	21.7	0	0	0	0.00	71.72	0.00	2.49	14.45	3.93	0.00	10.70	399.40	189135.12	0.00	399.40
17/07/12/22	23.6	0	0	0	0.00	78.85	0.00	2.81	14.42	4.07	0.00	10.70	399.10	194612.87	39.36	340.73
18/07/12/22	25.0	0	0	0	0.00	82.42	0.00	3.17	14.39	4.84	0.00	10.70	351.43	179932.02	39.36	312.05
19/07/12/22	24.8	0	0	0	0.00	89.22	0.00	2.99	14.35	4.28	0.00	10.70	322.78	165231.47	39.36	283.38
20/07/12/22	25.3	0	0	0	0.00	81.59	0.00	3.17	14.32	4.83	0.00	10.70	294.09	150879.92	39.36	254.71
21/07/12/22	25.8	0	0	0	0.00	82.42	0.00	3.17	14.28	4.81	0.00	10.70	265.41	135999.99	39.36	226.04
22/07/12/22	24.2	0	0	0	0.00	78.58	0.00	2.69	14.25	4.28	0.00	10.70	236.74	121209.83	39.36	197.36
23/07/12/22	24.2	1.3	0	1.3	0.00	78.58	0.00	2.99	14.21	4.28	0.00	10.70	208.06	106520.28	0.00	208.06
24/07/12/22	22.3	0	0	0	0.00	73.37	0.00	2.84	14.18	3.78	0.00	10.70	218.77	112098.73	0.00	218.77
25/07/12/22	21.7	0.3	0	0.3	0.00	71.72	0.00	2.49	14.15	3.83	0.00	10.70	228.47	117488.18	39.36	189.09
26/07/12/22	17.8	1	0	1	0.00	61.52	0.00	1.84	14.11	2.89	0.00	10.70	206.89	102897.84	0.00	206.89
27/07/12/22	18.3	0	0	0	0.00	62.87	0.00	2.08	14.08	2.87	0.00	10.70	211.59	108987.09	0.00	211.59
28/07/12/22	18.4	0	0	0	0.00	62.87	0.00	2.08	14.04	2.86	0.00	10.70	222.20	113786.54	39.36	182.83
29/07/12/22	19.8	0	0	0	0.00	66.81	0.00	2.20	14.01	3.13	0.00	10.70	193.53	99085.99	39.36	154.15
30/07/12/22	21.7	0	0	0	0.00	71.72	0.00	2.49	13.97	3.61	0.00	10.70	184.85	84405.44	39.36	125.48
31/07/12/22	22.8	0	0	0	0.00	74.74	0.00	2.84	13.94	3.71	0.00	10.70	158.18	69724.99	39.36	98.81
01/08/12/22	23.4	0.3	0	0.3	0.00	78.58	0.00	2.81	13.90	3.83	0.00	10.70	107.61	55044.35	39.36	68.13
02/08/12/22	22.4	4.3	0	4.3	0.00	74.74	0.00	2.64	13.87	3.70	0.00	10.70	78.43	40670.00	0.00	78.43
03/08/12/22	22.8	22.1	0	22.1	0.00	74.74	0.00	2.64	13.84	3.68	18.42	10.70	108.55	55579.07	0.00	108.55
04/08/12/22	19.7	0	0	0	0.00	58.00	0.00	1.82	13.80	2.58	0.00	10.70	119.25	61058.82	0.00	119.25
05/08/12/22	18.4	0	0	0	0.00	57.18	0.00	1.82	13.77	2.58	0.00	10.70	129.69	66537.87	39.36	90.33
06/08/12/22	17.8	3.8	0	3.8	0.00	61.02	0.00	1.94	13.73	2.73	1.07	10.70	192.38	52467.07	0.00	192.38
07/08/12/22	19.8	18.8	0	18.8	0.00	66.81	0.00	2.20	13.70	3.09	15.74	10.70	128.80	69455.82	0.00	128.80
08/08/12/22	17	5.3	0	5.3	0.00	64.83	0.00	1.94	13.66	3.72	2.58	10.70	152.08	12746.50	0.00	152.08
09/08/12/22	17.8	0	0	0	0.00	61.02	0.00	1.84	13.63	2.70	0.00	10.70	152.79	78223.89	0.00	152.79
10/08/12/22	15	0	0	0	0.00	53.34	0.00	1.71	13.59	2.40	0.00	10.70	163.49	83705.41	39.36	124.11
11/08/12/22	18.4	0.3	0	0.3	0.00	57.18	0.00	1.82	13.56	2.54	0.00	10.70	134.61	69024.60	39.36	95.44
12/08/12/22	20.0	0	0	0	0.00	68.70	0.00	2.34	13.53	3.21	0.00	10.70	108.14	54344.31	39.36	68.77
13/08/12/22	19.8	0	0	0	0.00	66.81	0.00	2.20	13.49	3.01	0.00	10.70	77.47	39963.78	39.36	38.09
14/08/12/22	21.7	28.7	0	28.7	0.00	71.72	0.00	2.49	13.46	3.38	29.32	10.70	74.11	39922.11	0.00	74.11
15/08/12/22	17.4	0	0	0	0.00	60.20	0.00	1.84	13.42	2.87	0.00	10.70	82.82	42491.80	0.00	82.82
16/08/12/22	17.8	3.8	0	3.8	0.00	61.02	0.00	1.94	13.39	2.86	1.14	10.70	84.86	48498.24	0.00	84.86
17/08/12/22	20.6	1.5	0	1.5	0.00	68.70	0.00	2.34	13.35	3.17	0.00	10.70	105.36	53845.99	0.00	105.36
18/08/12/22	23.1	0	0	0	0.00	75.58	0.00	2.81	13.32	3.75	0.00	10.70	118.06	59425.14	0.00	118.06
19/08/12/22	20.3	0	0	0	0.00	67.88	0.00	2.34	13.28	3.15	0.00	10.70	128.77	64994.39	39.36	87.39
20/08/12/22	20.3	0	0	0	0.00	67.88	0.00	2.34	13.25	3.15	0.00	10.70	88.99	46224.69	39.36	58.72
21/08/12/22	21.4	0	0	0	0.00	70.80	0.00	2.49	13.22	3.32	0.00	10.70	69.42	35543.50	39.36	30.06
22/08/12/22	24.5	0	0	0	0.00	79.40	0.00	2.89	13.18	3.84	0.00	10.70	40.75	20882.95	39.36	1.37
23/08/12/22	24.7	0.8	0	0.8	0.00	79.95	0.00	2.99	13.15	3.93	0.00	10.70	12.08	6182.40	0.00	12.08
24/08/12/22	25.6	1.8	0	1.8	0.00	82.42	0.00	3.17	13.11	4.14	0.00	10.70	22.78	11691.85	0.00	22.78
25/08/12/22	23.6	0	0	0	0.00	76.93	0.00	2.81	13.08	3.80	0.00	10.70	33.48	17141.31	0.00	33.48
26/08/12/22	22.5	7.4	0	7.4	0.00	73.91	0.00	2.84	13.04	3.48	3.82	10.70	48.11	24650.08	0.00	48.11
27/08/12/22	23.1	2.6	0	2.6	0.00	78.86	0.00	2.81	13.01	3.66	0.00	10.70	58.81	36109.53	0.00	58.81
28/08/12/22	20.8	0.5	0	0.5	0.00	69.25	0.00	2.34	12.97	3.08	0.00	10.70	69.51	35588.98	0.00	69.51
29/08/12/22	20.8	0	0	0	0.00	68.70	0.00	2.34	12.94	3.07	0.00	10.70	80.21	41088.43	0.00	80.21
30/08/12/22	19.7	0	0	0	0.00	66.23	0.00	2.20	12.91	2.88	0.00	10.70	90.91	45447.88	39.36	51.54
31/08/12/22	23.1	0	0	0	0.00	75.58	0.00	2.81	12.87	3.84	0.00	10.70	82.24	31867.34	19.69	42.55
01/09/12/22	24.5	0	0	0	0.00	79.40	0.00	2.99	12.84	3.84	0.00	10.70	63.28	27288.79	19.69	33.57
02/09/12/22	22.8	2	0	2	0.00	73.94	0.00	2.84	12.80	3.42	0.00	10.70	44.27	22892.24	0.00	44.27
03/09/12/22	18.4	0	0	0	0.00	67.18	0.00	1.82	12.77	2.39	0.00	10.70	54.97	28145.89	0.00	54.97
04/09/12/22	14.5	0	0	0	0.00	51.87	0.00	1.80	12.73	2.11	0.00	10.70	95.87	33825.14	19.69	45.90
05/09/12/22	15.3	0	0	0	0.00	54.18	0.00	1.71	12.70	2.24	0.00	10.70	56.89	28024.80	19.69	37.00
06/09/12/22	18.9	0	0	0	0.00	64.04										

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
Province ONTARIO
Latitude 42.88
Longitude -79.25
Elevation 175.3
Climate ic 6136606
WMO Identifier
TC Identifier

Max. Allowable Release: Summer, Winter Spring, Fall
14000 L/min 7000 L/min
0.125 m³/s 0.0625 m³/s
39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
5479.452 m³/day
10.70 mm

Phase 1A Quarry Area 51.2 ha
Max. Storage Volume 1444.99 mm
739835 m³

Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)	
27/09/1972	13.1	0	0	0	0.00	48.13	0.00	1.50	11.97	1.86	0.00	10.70	86.92	44507.85	0.00	86.92	
28/09/1972	13.8	0	0	0	0.00	49.50	0.00	1.50	11.94	1.89	0.00	10.70	97.62	49882.31	19.69	77.93	
29/09/1972	18.9	29.9	0	29.9	0.00	44.04	0.00	2.06	11.91	2.51	24.39	10.70	113.03	51871.93	0.00	113.03	
30/09/1972	9.7	0.8	0	0.8	0.00	38.80	0.00	1.15	11.87	1.44	0.00	10.70	123.73	53150.46	0.00	123.73	
01/10/1972	9.2	1.5	0	1.5	0.00	37.43	0.00	1.15	11.84	1.43	0.07	10.70	134.50	54663.34	0.00	134.50	
02/10/1972	18.3	0	0	0	0.00	54.16	0.00	1.71	11.81	2.08	0.00	10.70	145.20	56342.79	0.00	145.20	
03/10/1972	18.1	0	0	0	0.00	61.84	0.00	2.06	11.78	2.49	0.00	10.70	155.00	58222.24	19.69	135.22	
04/10/1972	17.8	0	0	0	0.00	61.02	0.00	1.94	11.75	2.33	0.00	10.70	164.92	59221.09	19.69	147.23	
05/10/1972	18.4	0	0	0	0.00	62.87	0.00	2.06	11.72	2.47	0.00	10.70	174.95	60311.14	19.69	158.24	
06/10/1972	17.3	39.2	0	39.2	0.00	59.65	0.00	1.84	11.69	2.32	27.88	10.70	184.82	60500.17	0.00	159.82	
07/10/1972	10	0.5	0	0.5	0.00	39.82	0.00	1.23	11.66	1.51	0.00	10.70	197.52	61727.02	0.00	197.52	
08/10/1972	10.6	0	0	0	0.00	41.27	0.00	1.23	11.63	1.50	0.00	10.70	178.23	61232.07	0.00	178.23	
09/10/1972	8.4	0	0	0	0.00	28.75	0.00	0.94	11.60	1.18	0.00	10.70	188.99	60731.62	19.69	189.24	
10/10/1972	6.1	0	0	0	0.00	28.93	0.00	0.94	11.57	1.15	0.00	10.70	179.84	62130.87	19.69	190.28	
11/10/1972	12.8	1	0	1	0.00	47.30	0.00	1.40	11.54	1.89	0.00	10.70	170.86	62730.43	0.00	170.86	
12/10/1972	19.8	2.3	0	2.3	0.00	49.59	0.00	1.50	11.50	1.79	0.21	10.70	182.17	63271.18	0.00	182.17	
13/10/1972	7	0	0	0	0.00	31.99	0.00	1.00	11.47	1.22	0.00	10.70	192.87	60750.61	0.00	192.87	
14/10/1972	12	0	0	0	0.00	45.11	0.00	1.40	11.44	1.89	0.00	10.70	203.57	61420.06	19.69	183.89	
15/10/1972	5.8	4.6	0	4.6	0.00	27.65	0.00	0.87	11.41	1.09	3.64	10.70	188.13	60440.18	0.00	188.13	
16/10/1972	8.9	5.1	0	5.1	0.00	38.61	0.00	1.07	11.38	1.29	3.81	10.70	217.64	60870.36	0.00	217.64	
17/10/1972	5.3	0	0	0	0.00	28.73	0.00	0.87	11.35	1.09	0.00	10.70	223.34	61434.81	0.00	223.34	
18/10/1972	9.8	3.8	0	3.8	0.00	0.00	0.00	0.91	11.32	0.78	2.85	10.70	236.89	61387.31	0.00	236.89	
19/10/1972	9.8	0	0	0	0.00	0.00	0.00	0.81	11.29	0.78	0.00	10.70	247.56	60496.76	0.00	247.56	
20/10/1972	2.8	0	0	0	0.00	19.87	0.00	0.71	11.26	0.86	0.00	10.70	258.29	61324.21	19.69	238.61	
21/10/1972	5.9	5.3	0	5.3	0.00	28.36	0.00	0.87	11.23	1.05	4.23	10.70	253.56	62084.14	0.00	253.56	
22/10/1972	9.5	13.7	0	13.7	0.00	38.25	0.00	1.16	11.20	1.35	12.35	10.70	278.61	61162.32	0.00	278.61	
23/10/1972	11.7	7.4	0	7.4	0.00	44.29	0.00	1.31	11.18	1.53	6.87	10.70	293.18	60106.15	0.00	293.18	
24/10/1972	4.2	0.5	0	0.5	0.00	23.71	0.00	0.81	11.15	0.87	0.00	10.70	309.86	61587.81	0.00	309.86	
25/10/1972	11.8	0	0	0	0.00	23.38	0.00	0.81	11.12	0.87	0.00	10.70	314.58	60187.00	0.00	314.58	
26/10/1972	6.7	0	0	0	0.00	30.57	0.00	0.94	11.07	1.10	0.00	10.70	325.29	60846.51	19.69	305.60	
27/10/1972	11.7	0	0	0	0.00	44.29	0.00	1.31	11.04	1.52	0.00	10.70	318.30	60184.96	19.69	298.61	
28/10/1972	10.9	7.4	0	7.4	0.00	42.09	0.00	1.23	11.01	1.42	5.98	10.70	313.30	60008.13	0.00	313.30	
29/10/1972	7.2	4.1	0	4.1	0.00	31.84	0.00	1.00	10.99	1.17	2.82	10.70	328.92	60738.13	0.00	328.92	
30/10/1972	2.8	0	0	0	0.00	19.87	0.00	0.71	10.95	0.83	0.00	10.70	337.63	61288.58	0.00	337.63	
31/10/1972	1.4	0	0	0	0.00	19.83	0.00	0.66	10.92	0.78	0.00	10.70	349.32	61857.04	19.69	328.65	
01/11/1972	5.8	15.5	0	15.5	0.00	0.00	0.00	0.87	10.89	1.01	14.69	10.70	353.83	60182.98	0.00	353.83	
02/11/1972	12.3	1.3	0	1.3	0.00	45.83	0.00	1.40	10.86	1.59	0.00	10.70	364.64	60842.43	0.00	364.64	
03/11/1972	9.5	0.5	0	0.5	0.00	37.43	0.00	1.15	10.83	1.31	0.00	10.70	375.24	60212.89	0.00	375.24	
04/11/1972	6.1	3.3	0	3.3	0.00	28.83	0.00	0.94	10.79	1.08	2.22	10.70	386.19	60739.56	0.00	386.19	
05/11/1972	5	0	0	0	0.00	23.91	0.00	0.87	10.78	1.01	0.00	10.70	398.87	60421.90	0.00	398.87	
06/11/1972	6.7	0	0	0	0.00	39.99	0.00	1.07	10.75	1.24	0.00	10.70	409.67	60999.46	19.69	398.87	
07/11/1972	9.2	13.2	0	13.2	0.00	27.65	0.00	0.81	10.72	0.80	11.92	10.70	412.49	61189.54	0.00	412.49	
08/11/1972	7.8	1.8	0	1.8	0.00	33.59	0.00	1.00	10.67	1.13	0.87	10.70	423.85	61703.01	0.00	423.85	
09/11/1972	3.1	0	0	0	0.00	20.70	0.00	0.78	10.64	0.87	0.00	10.70	434.66	62249.46	0.00	434.66	
10/11/1972	5.8	5.1	0	5.1	0.00	27.65	0.00	0.87	10.61	0.98	4.11	10.70	449.37	60079.85	0.00	449.37	
11/11/1972	5.8	1.8	0	1.8	0.00	28.10	0.00	0.87	10.58	0.99	0.81	10.70	460.89	61367.38	0.00	460.89	
12/11/1972	5.3	0	0	0	0.00	29.73	0.00	0.87	10.55	0.98	0.00	10.70	471.56	61452.84	0.00	471.56	
13/11/1972	5.6	8.6	0	8.6	13.7	3.10	27.65	5.10	0.87	10.52	0.88	12.72	10.70	485.91	62344.95	0.00	485.91
14/11/1972	-1.1	0	0	0	0.00	0.00	0.00	0.58	10.49	0.87	0.00	10.70	505.71	62892.40	0.00	505.71	
15/11/1972	-2.8	0	0	0	0.00	0.00	0.00	0.55	10.46	0.84	0.00	10.70	518.41	62449.85	19.69	498.73	
16/11/1972	-2.8	0	0	0	0.00	0.00	0.00	0.55	10.42	0.84	0.00	10.70	507.43	62690.30	19.69	487.74	
17/11/1972	-1.4	0	0	0	0.00	0.00	0.00	0.58	10.39	0.86	0.00	10.70	499.44	62520.76	19.69	478.76	
18/11/1972	0.3	0	0	0	0.00	0.00	0.00	0.81	10.36	0.89	0.00	10.70	489.48	63082.21	19.69	489.77	
19/11/1972	2.2	0	0	0	0.00	13.79	0.00	0.71	10.33	0.79	12.81	10.70	489.28	62581.84	0.00	492.36	
20/11/1972	-1.4	0	0	0	0.00	18.03	0.00	0.66	10.30	0.73	0.00	10.70	504.08	62809.30	0.00	504.08	
21/11/1972	-2.5	0	0	0	0.00	0.00	0.00	0.55	10.27	0.83	0.00	10.70	514.79	62337.85	19.69	495.10	
22/11/1972	-3.4	0	0	0	0.00	0.00	0.00	0.52	10.24	0.69	0.00	10.70	505.80	62897.30	19.69	486.11	
23/11/1972	-2.8	0	0	0	0.00	0.00	0.00	0.55	10.21	0.82	0.00	10.70	498.82	624399.75	19.69	477.13	
24/11/1972	1.7	0	0	0	0.00	18.88	0.00	0.69	10.18	0.72	0.00	10.70	487.83	624979.20	19.69	469.14	
25/11/1972	3.9	5.3	0	5.3	0.00	22.89	0.00	0.78	10.15	0.83	4.47	10.70	493.32	624758.79	0.00	483.32	
26/11/1972	3.4	14	0	14	0.00	21.52	0.00	0.78	10.12	0.83	13.17	10.70	507.18	62683.24	0.00	507.18	
27/11/1972	2.5	5.3	0	5.3	0.00	18.05	0.00	0.71	10.09	0.77	4.53	10.70	522.43	627482.26	0.00	522.43	
28/11/1972	2	0	0	0	0.00	17.88	0.00	0.71	10.05	0.77	0.00	10.70	533.13	627981.71	0.00	533.13	
29/11/1972	-0.8	0	0	0	0.00	0.00	0.00	0.58	10.02	0.84	0.00	10.70	543.83	627441.19	19.69	524.14	
30/11/1972	0.8	8.9	2.5	11.4	2.50	0.00	0.00	0.61	9.99	0.88	8.24	10.70	543.08	627057.65	0.00	543.08	
01/12/1972	0.8	0	0	0	0.00	0.00	0.00	0.81	9.96	0.89	0.00	10.70	553.78	629337.10	0.00	553.78	
02/12/1972	-2.2	0.5	0	0.5	0.30	0.00	0.00	0.55	9.93	0.80	0.00	10.70	564.46	629919.55	0.00	564.46	
03/12/1972	-0.90	0	0	0	0.00	0.00	0.00	0.58	9.90	0.83	0.00	10.70	575.19	624496.91	0.00	575.19	
04/12/1972	-4.7	0	0	0	0.00	0.00	0.00	0.50	9.87	0.84	0.00	10.70	585.89	629975.46	39.38	546.51	
05/12/1972	3.1	5.3	0	5.3	18.20	20.70	18.20	0.78	9.84	0.80	22.70	10.70	579.91	629961.10	0.00</		

**Running Daily Water Balance, Reeb Quarry - Phase 2 with Worst Case Groundwater Inflow
Climate Data 1965-2007**

Station N: PORT COLBORNE
 Province: ONTARIO
 Latitude: 42.88
 Longitude: -79.25
 Elevation: 175.3
 Climate I: 6136806
 WMO Identifier:
 TC Identifier:

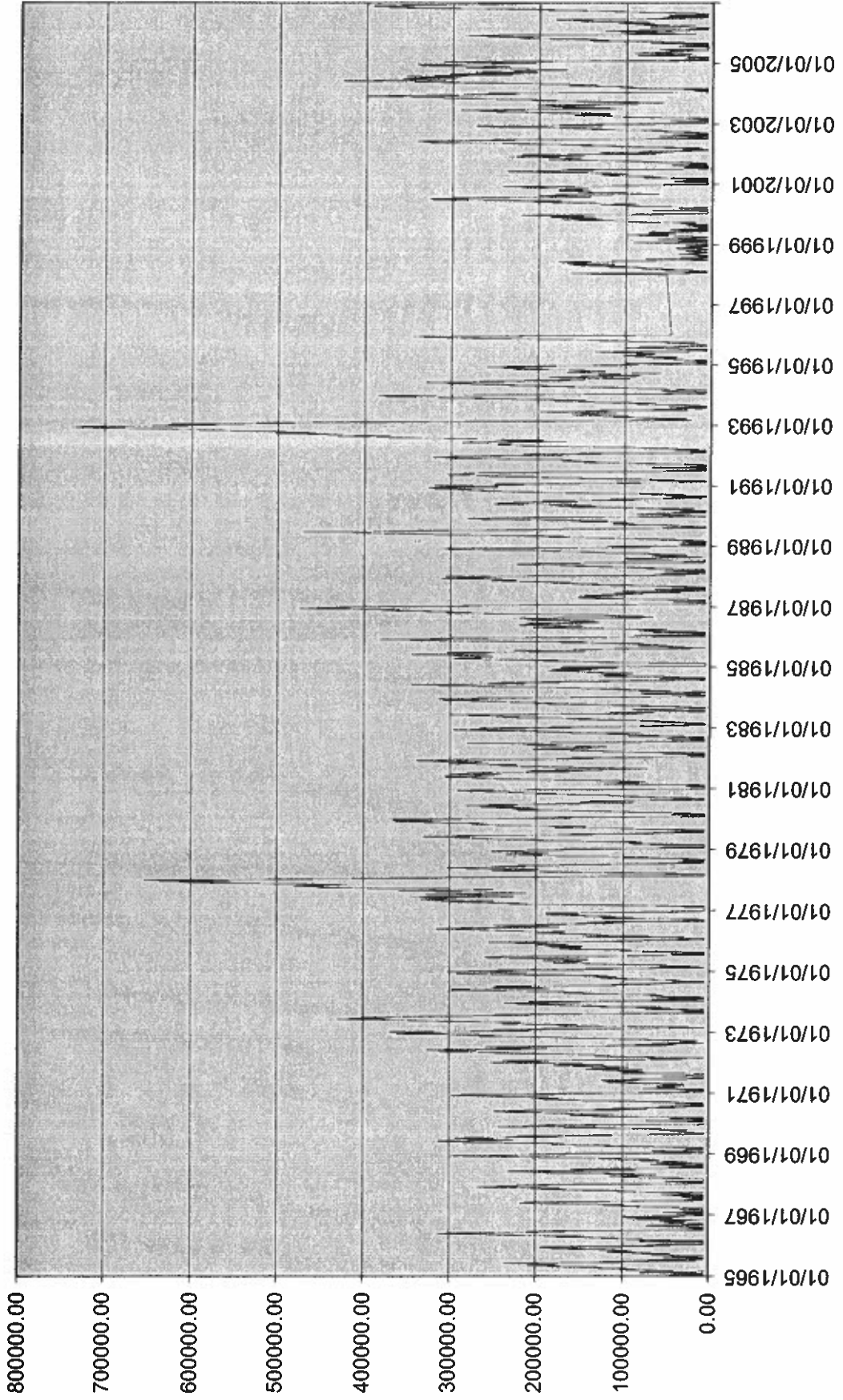
Max. Allowable Release: Summer, Winter Spring, Fall
 14000 L/min 7000 L/min
 0.125 m³/s 0.0625 m³/s
 39.38 mm 19.69 mm

Groundwater Inflow 2,000,000 m³/yr
 5479.452 m³/day
 10.70 mm

Phase 1A Quarry Area 51.2 ha
 Max. Storage Volume 1444.99 mm
 739835 m³

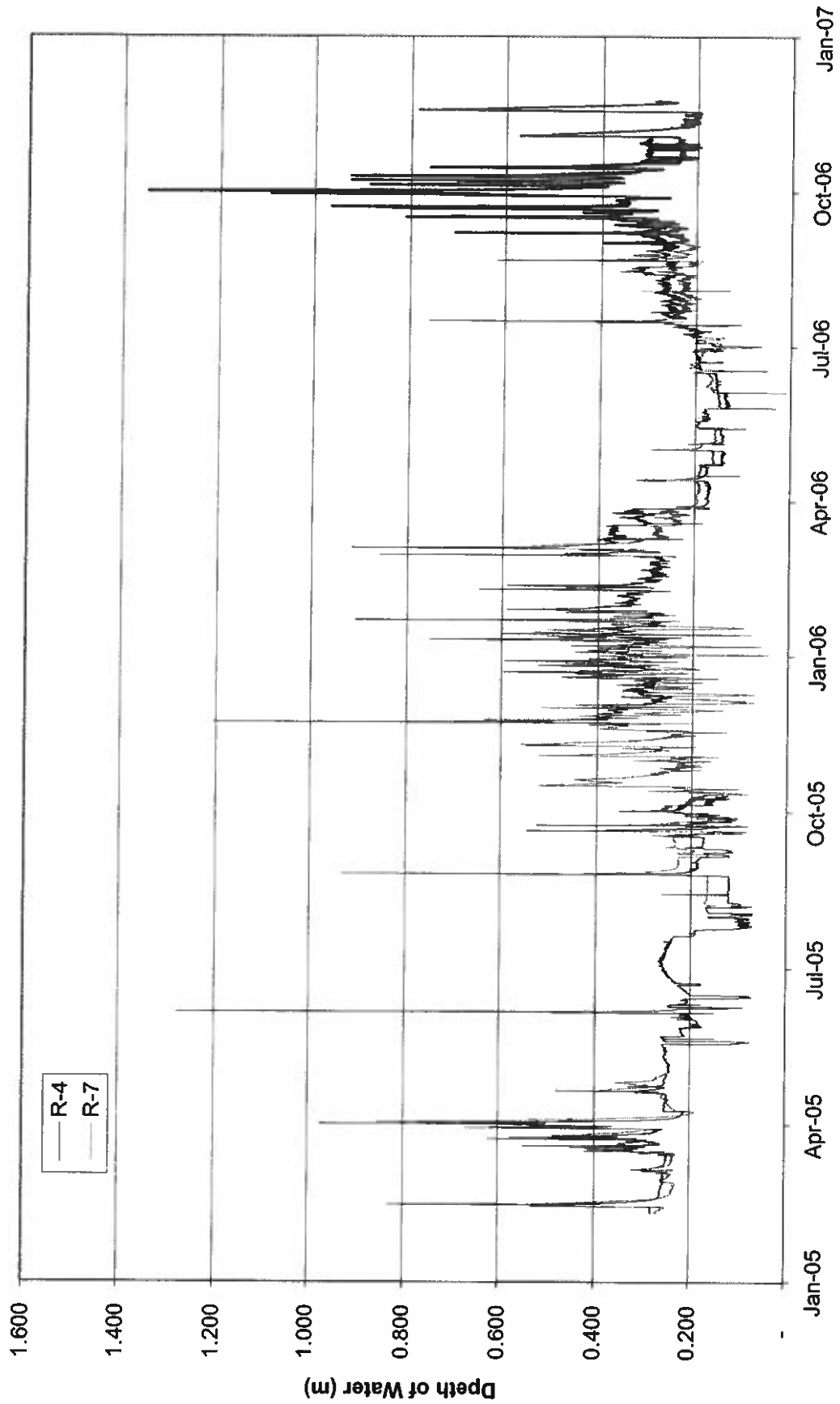
Date	Mean Temp (C)	Total Rain (mm)	Total Snow (cm)	Total Precip (mm)	Snowpack (mm)	Potential Snowmelt (mm)	Actual Snowmelt (mm)	Saturated Vapour Pressure (kPa)	Daylight Hours (hr)	E (mm)	Surplus (mm)	GW Inflow (mm)	Storage Volume (mm)	Storage Volume (m ³)	Allowable Release Volume (mm)	Storage Carryover (mm)
26/12/1972	1.2	2	0	2	0.00	15.48	0.00	0.68	9.19	0.68	1.34	10.70	667.26	341636.73	0.00	667.26
27/12/1972	-9.3	0.3	0	0.3	0.00	0.00	0.00	0.58	9.15	0.58	0.00	10.70	677.87	347119.18	0.00	677.87
28/12/1972	0.9	9	0	9	0.00	0.00	0.00	0.81	9.13	0.81	0.00	10.70	686.87	352597.63	39.38	648.29
29/12/1972	-2	0.5	0	0.5	0.00	0.00	0.00	0.58	9.10	0.58	0.00	10.70	659.60	337917.08	0.00	659.60
30/12/1972	2.5	3.8	0	3.8	0.00	19.05	0.00	0.71	9.07	0.69	3.11	10.70	673.80	344687.88	0.00	673.80
31/12/1972	7.8	6.9	0	6.9	0.00	23.59	0.00	1.00	9.07	0.68	5.84	10.70	690.44	353505.83	0.00	690.44

Required Storage Volume (m³) 1965-2006
Phase 2 (Worst Case Groundwater Inflow)

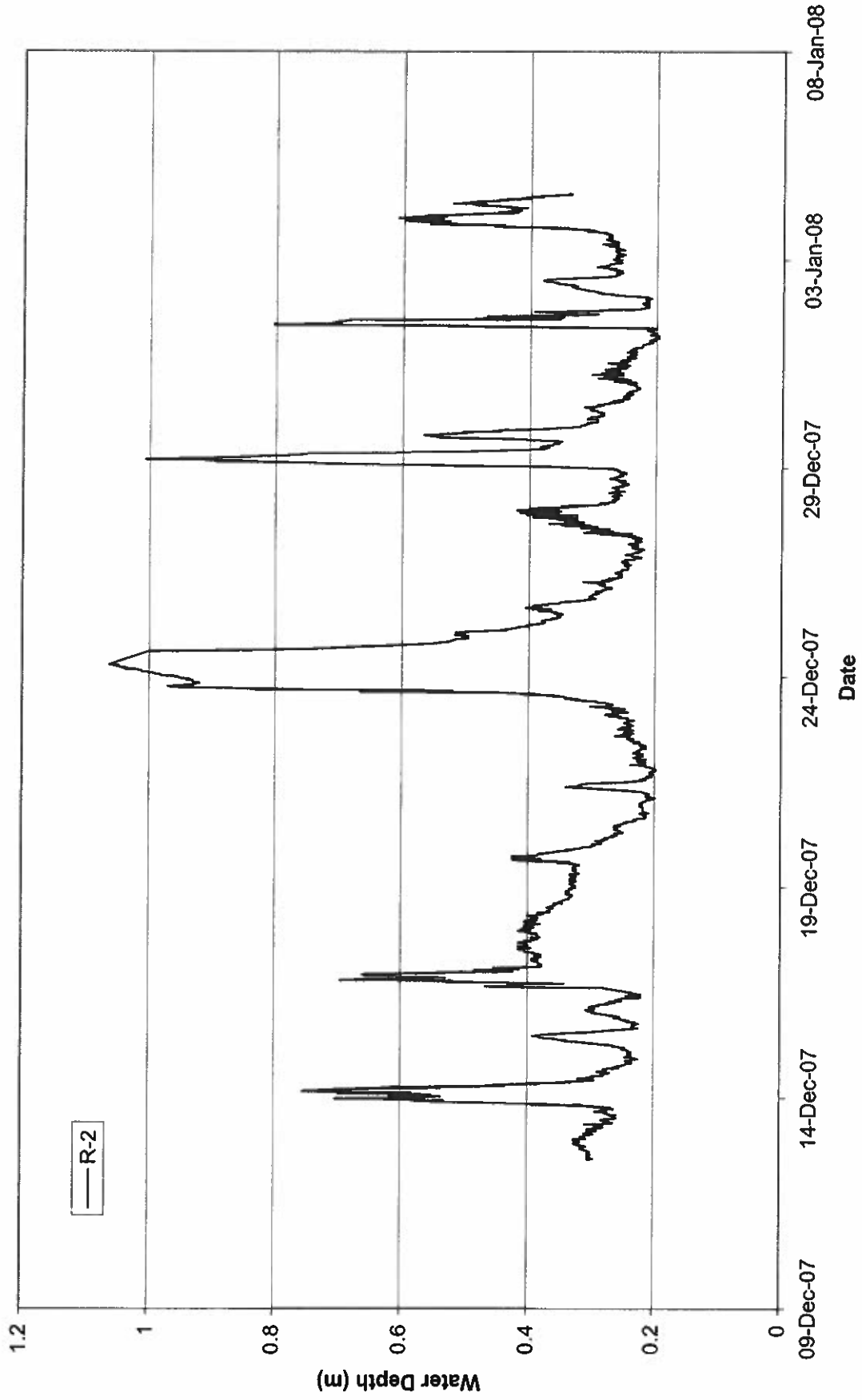


**APPENDIX D: EAGLE MARSH DRAIN WATER LEVEL
MONITORING DATA**

Surface Water Flow in EMD at Hwy 3 (R-7) and Rail Berm (R-7)



Surface Water Flow in EMD at Cement Plant Road (R-2)



Area-Velocity Flow Calculations for R-2 (Cement Plant Road Crossing)

Total Flow (m3/sec)	
28-Nov-05	0.256
02-Feb-06	0.214
08-Mar-06	0.151
16-Apr-06	NF
11-May-06	0.179
15-Jun-06	0.157
17-Jul-06	0.416
15-Aug-06	0.260
12-Sep-06	0.293
17-Oct-06	0.675
14-Nov-06	0.584
07-Dec-06	0.347
24-May-07	0.450
14-Jun-07	0.207
23-Aug-07	0.2002
12-Sep-07	0.3
03-Oct-07	not moving
07-Nov-07	0.405

Total Flow (L/min)	
28-Nov-05	15,356
02-Feb-06	12,858
08-Mar-06	9,061
16-Apr-06	
11-May-06	10,710
15-Jun-06	9,392
17-Jul-06	24,959
15-Aug-06	15,570
12-Sep-06	17,550
17-Oct-06	40,500
14-Nov-06	35,064
07-Dec-06	20,844
24-May-07	27,000
14-Jun-07	12,438

Area-Velocity Flow Calculations for R-7 (Hwy 3 Crossing)

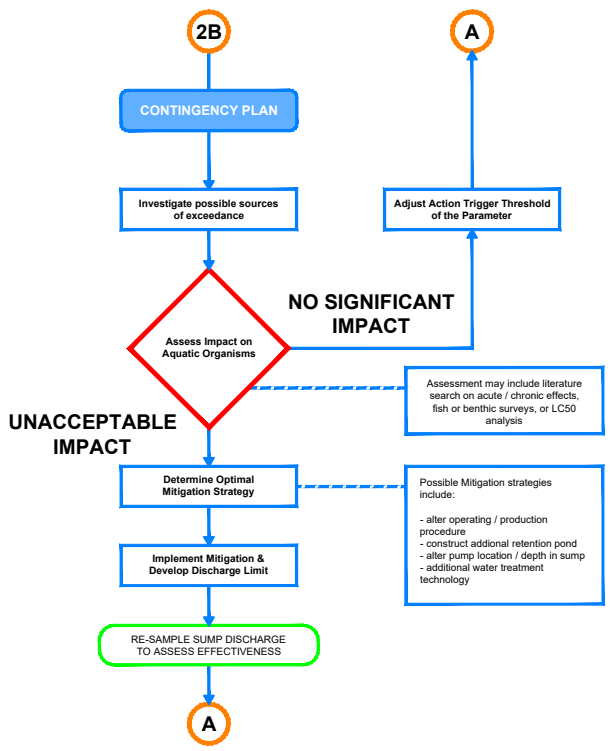
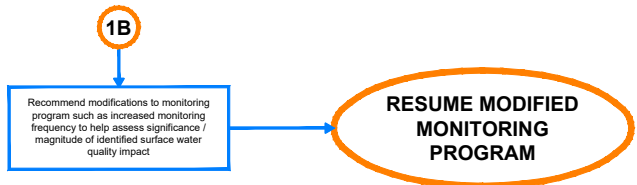
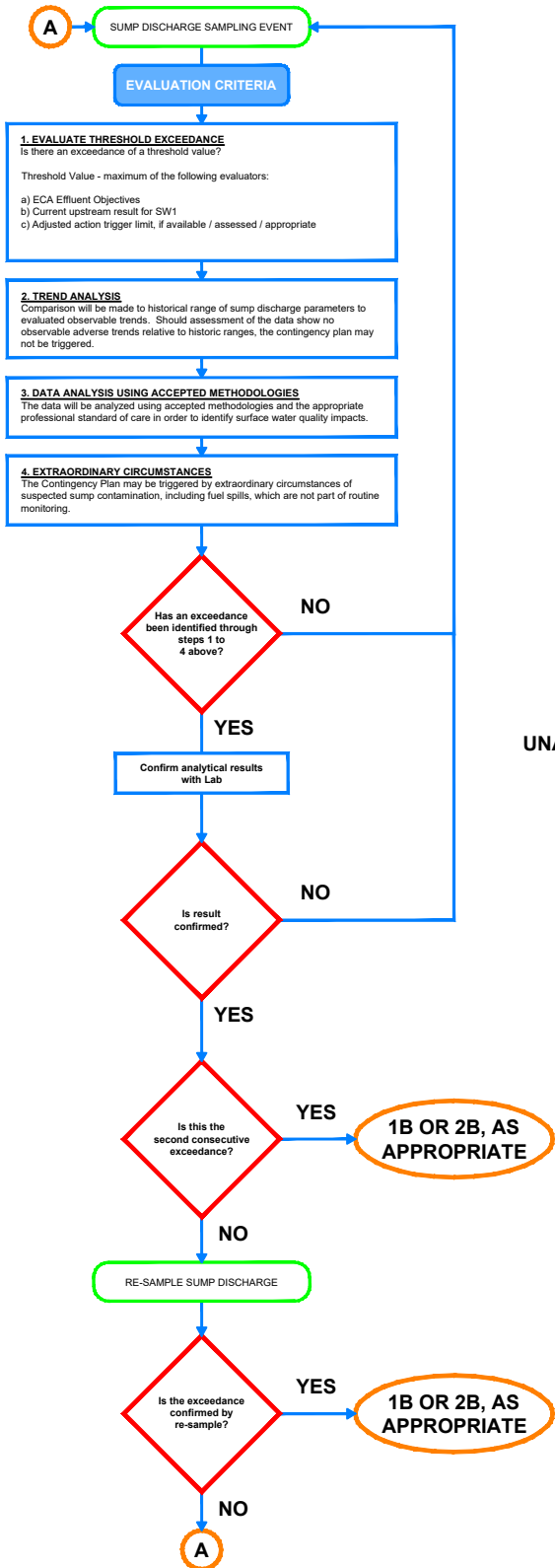
	Total Flow (m3/sec)
28-Nov-05	0.276
02-Feb-06	0.220
08-Mar-06	0.118
16-Apr-06	0.072
11-May-06	0.062
15-Jun-06	0.024
17-Jul-06	0.065
15-Aug-06	0.096
12-Sep-06	0.158
17-Oct-06	0.563
14-Nov-06	0.189
07-Dec-06	0.188
24-May-07	0.146
14-Jun-07	0.084
23-Aug-07	flooded
12-Sep-07	flooded
03-Oct-07	flooded
07-Nov-07	flooded

Area-Velocity Flow Calculations for R-4B (Rail Berm Crossing)

Concrete culvert

Total Flow (m3/sec)

28-Nov-05	0.080
02-Feb-06	0.082
08-Mar-06	0.101
16-Apr-06	0.111
11-May-06	0.062
15-Jun-06	0.057
17-Jul-06	0.089
15-Aug-06	0.101
12-Sep-06	0.230
17-Oct-06	0.898
14-Nov-06	0.198
07-Dec-06	0.315
24-May-07	0.080
14-Jun-07	0.096
23-Aug-07	0.180
12-Sep-07	0.060
03-Oct-07	0.054
07-Nov-07	0.110



PROPOSED QUARRY DISCHARGE TRIGGER MECHANISM AND CONTINGENCY PLAN



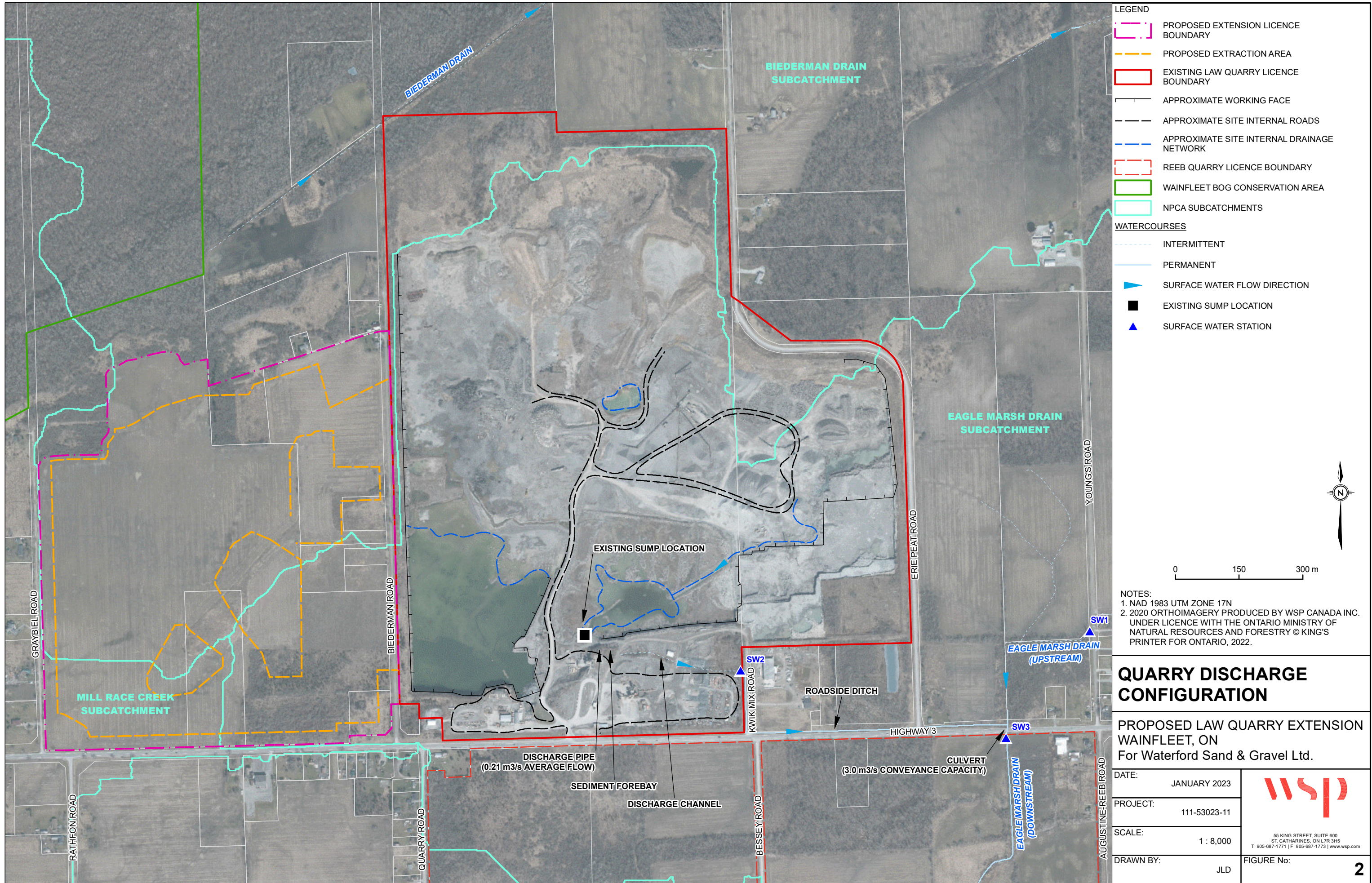
PROPOSED LAW QUARRY EXTENSION
WAINFLEET, ON
For Waterford Sand & Gravel Ltd.

SCALE: NOT TO SCALE
DRAWN BY: JLD

DATE: JANUARY 2023

PROJECT: 111-53023-11

FIGURE No: **1**

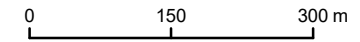


LEGEND

- PROPOSED EXTENSION LICENCE BOUNDARY
- PROPOSED EXTRACTION AREA
- EXISTING LAW QUARRY LICENCE BOUNDARY
- APPROXIMATE WORKING FACE
- APPROXIMATE SITE INTERNAL ROADS
- APPROXIMATE SITE INTERNAL DRAINAGE NETWORK
- REEB QUARRY LICENCE BOUNDARY
- WAINFLEET BOG CONSERVATION AREA
- NPCA SUBCATCHMENTS

WATERCOURSES

- INTERMITTENT
- PERMANENT
- ▶ SURFACE WATER FLOW DIRECTION
- EXISTING SUMP LOCATION
- ▲ SURFACE WATER STATION



NOTES:
 1. NAD 1983 UTM ZONE 17N
 2. 2020 ORTHOIMAGERY PRODUCED BY WSP CANADA INC. UNDER LICENCE WITH THE ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY © KING'S PRINTER FOR ONTARIO, 2022.

QUARRY DISCHARGE CONFIGURATION

PROPOSED LAW QUARRY EXTENSION WAINFLEET, ON
 For Waterford Sand & Gravel Ltd.

DATE:	JANUARY 2023
PROJECT:	111-53023-11
SCALE:	1 : 8,000
DRAWN BY:	JLD

55 KING STREET, SUITE 600
ST. CATHARINES, ON L7R 3H5
T 905-687-1771 | F 905-687-1773 | www.wsp.com

FIGURE No: 2