

Functional Servicing and Stormwater Management Design Report – Southern Lands (968 St. David St N)

Township of Centre Wellington (Fergus), Ontario

Submitted to:

Polocorp Inc.
379 Queen Street South
Kitchener, ON N2G 1W6

Submitted by:

GEI Consultants Canada Ltd.
330 Trillium Drive, Unit D
Kitchener, ON N2E 3J2
519.748.1440

March 12, 2025
Project No. 2401807

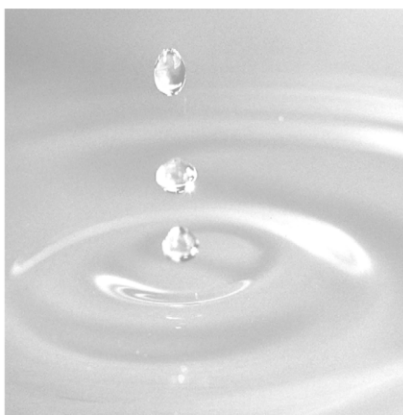


Table of Contents

Certification	iii
1. Introduction	1
2. Existing Conditions	2
2.1. Land Use	2
2.2. Topography	2
2.3. Soils	2
2.4. Groundwater	2
3. Proposed Development	3
3.1. Site Grading	3
3.2. Streets	3
3.3. Water Supply	3
3.4. Sanitary Sewer	4
3.5. Storm Sewer	5
4. Stormwater Management Criteria	6
5. Stormwater Management Plan	8
5.1. Existing Conditions	8
5.2. Stormwater Management Overview	9
5.3. Interim Post-Development Conditions	11
5.3.1. Routing – Interim Post-Development Conditions	12
5.4. Ultimate Post-Development Conditions	16
5.4.1. Routing – Ultimate Post-Development Conditions	17
6. Infiltration Assessment	23
7. Sediment and Erosion Control Plan	24
8. Maintenance Plan	25
9. Conclusions	26
List of Tables	
Table No. 1: Domestic Water Demand Requirements	4
Table No. 2: Fergus Shand Dam - Chicago Storm Parameters	6
Table No. 3: MIDUSS – Horton Infiltration Parameters	7
Table No. 4: Existing Conditions Flow Rates	9
Table No. 5: Interim Post-Development Uncontrolled Flow Rates	12

Table No. 6:	Stormwater Management Facility – Stage/Storage/Discharge Comparison	13
Table No. 7:	Interim Post-Development Condition Controlled Flow Rates	14
Table No. 8:	Comparison of Existing and Post-Development Flows - to Highway 6 (St. David Street N)	14
Table No. 9:	Comparison of Existing and Post-Development Flows - to Northeast Wetland	15
Table No. 10:	Comparison of Existing and Post-Development Flows - to West Farm Field	15
Table No. 11:	Comparison of Existing and Post-Development Flows - Totals from the Site	15
Table No. 12:	Post-Development Uncontrolled Flow Rates	17
Table No. 13:	Stormwater Management Facility – Stage/Storage/Discharge Comparison	18
Table No. 14:	Post-Development Controlled Flow Rates	19
Table No. 15:	Comparison of Existing and Post-Development Flows - to Highway 6 (St. David Street N)	19
Table No. 16:	Comparison of Existing and Post-Development Flows - to Northeast Wetland	20
Table No. 17:	Comparison of Existing and Post-Development Flows - to West Farm Field	20
Table No. 18:	Comparison of Existing and Post-Development Flows - Totals from the Site	20
Table No. 19:	Sediment Forebay Design Details	21
Table No. 20:	Sediment Loading and Cleanout Frequency – Sediment Forebays	21

List of Figures

- Figure No. 1 – Location Plan
 Figure No. 2 – Draft Plan of Subdivision
 Figure No. 3 – Existing Conditions Drainage Areas
 Figure No. 4 – Interim Post-Development Conditions Drainage Areas
 Figure No. 5 – Ultimate Post-Development Conditions Drainage Areas

Appendices

- Appendix A Geotechnical Investigation (Chung and Vander Doelen Engineering Ltd., dated February 6, 2025) and Preliminary Hydrogeological Investigation (Chung and Vander Doelen Engineering Ltd., dated January 31, 2025)
 Appendix B Sewer Design Sheets
 Appendix C Stormwater Management Analysis
 C.1. Existing Conditions Modelling
 C.2. Interim Post-Development Conditions Modelling
 C.3. Ultimate Post-Development Conditions Modelling
 Appendix D Water Balance Analysis

PG/PW

Certification

PREPARED BY:

GEI Consultants Canada Ltd.



Patricia Wiebe, P.Eng.
Project Engineer



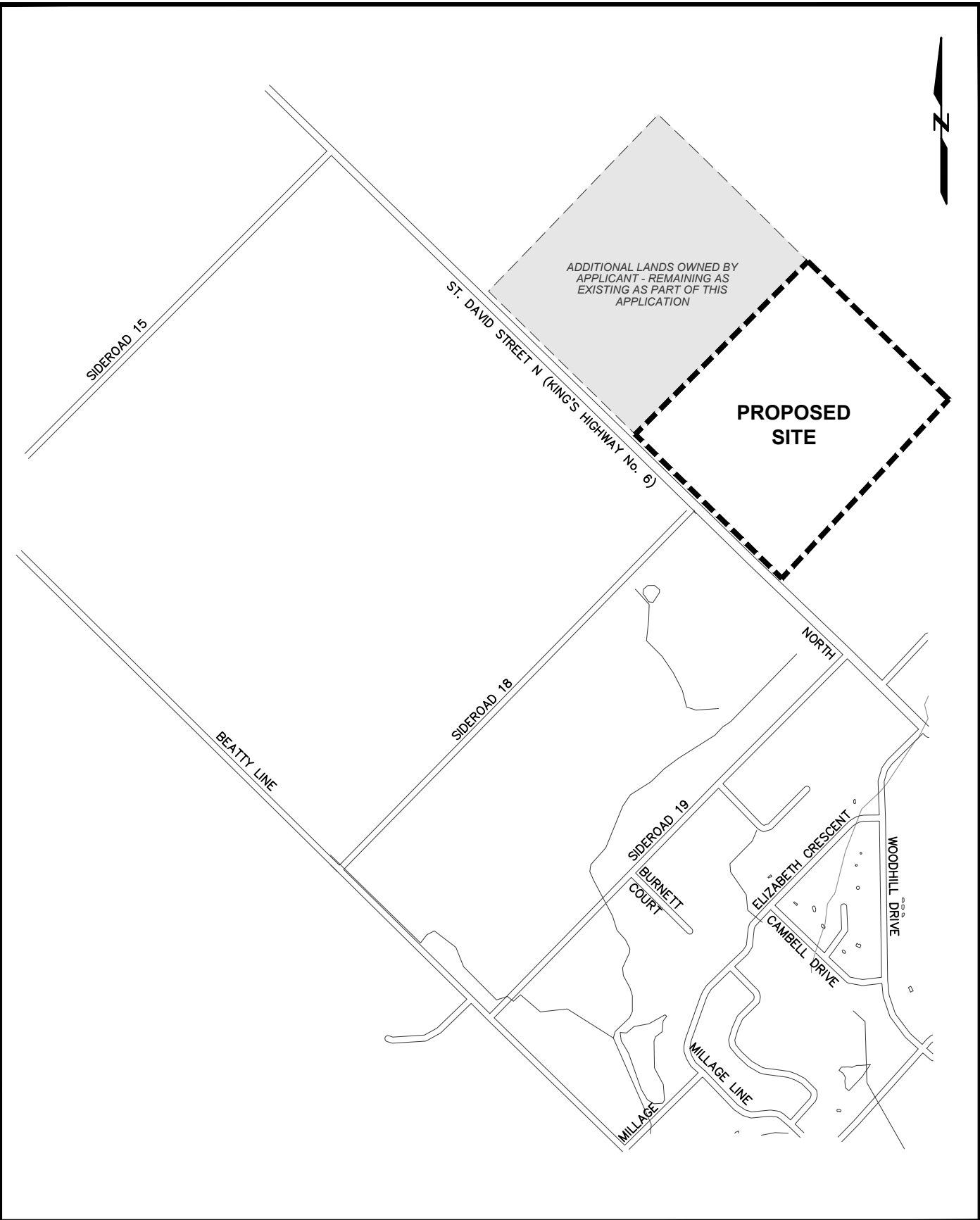
Patrick Grier, P.Eng.
Senior Project Engineer



1. Introduction

GEI Consultants Canada Ltd. have prepared this Functional Servicing Report to address the site servicing and stormwater management requirements for the proposed development in support of the Draft Plan approval. The Draft Plan of Subdivision has been prepared by Polocorp Inc. (dated December 10, 2024).

The proposed 19.39 ha development (site) is located north of St. David Street N (Highway No. 6), east of existing commercial development, and south of existing agricultural lands in Fergus. There are external lands west of the proposed development that are also owned by the applicant and are currently used for agriculture. The adjacent additional lands owned by the applicant will be part of a separate application for development. Figure 1 shows the location of the proposed development and the surrounding area. The wetland area in the northeast limits of the site is regulated by the Grand River Conservation Authority (GRCA).



FERGUS SUBDIVISION - SOUTH LANDS TOWNSHIP OF CENTRE WELLINGTON (FERGUS)	GEI Consultants	LOCATION PLAN
POLOCORP	Project 2401807	FEBRUARY 2025 Figure No. 1

2. Existing Conditions

2.1. Land Use

The site is currently a vacant agricultural field. One (1) existing dwelling is located along the southwest limits of the site. This dwelling is to remain under post-development conditions.

2.2. Topography

The majority of the site drains by sheetflow in an easterly direction towards the wetland along the northeast limits of the site. A portion of the site along the south limits sheetflows south to the roadside ditch along the Highway 6 right-of-way. The roadside ditch along Highway 6 ultimately discharges to a regulated watercourse downstream of the northeast wetland.

2.3. Soils

A Geotechnical Investigation has been completed by Chung & Vander Doelen Engineering Ltd. in 2025. The geotechnical investigation consisted of five (5) boreholes across the site to depths ranging from 5.2 m to 8.25 m below the ground surface (bgs) and three (3) additional boreholes on the adjacent property owned by the applicant. Based on the geotechnical investigation, the site soils generally consist of approximately 180 mm to 300 mm thick topsoil followed by clayey sand silt and sandy silt.

A copy of the Geotechnical Investigation is included in Appendix A.

2.4. Groundwater

A Preliminary Hydrogeological Investigation has been completed by Chung & Vander Doelen Engineering Ltd. in 2025. As part of the hydrogeological study, five (5) monitoring wells and four (4) shallow piezometers were installed between December 2023 and March 2024, as well as three (3) additional monitoring wells on the adjacent property owned by the applicant.

Groundwater monitoring results indicate that the seasonal high groundwater levels on site vary from 0.25 m below ground surface at the northeast limits of the site (BH/MW 8) to approximately 3.61 m below ground surface towards the southwest limits of the site (BH / MW 4). A copy of the Preliminary Hydrogeological Investigation is included in Appendix A.

3. Proposed Development

The proposed 19.39 ha residential development generally consists of 62-88 single-detached lots, 80–118 on-street townhouse units, 71-102 medium density residential units, 8-14 mixed use residential units, an open space block, internal roadways, and a stormwater management block. Figure 2 illustrates the proposed Draft Plan of Subdivision prepared by Polocorp Inc.. Connection to the site will be via the Street B connection to St. David Street N (Highway No. 6) and Streets A, D, E, and F to the adjacent property owned by the same applicant.

3.1. Site Grading

The site grading for the proposed residential lots, internal roads and stormwater management facility is shown on the Grading Plans. The site has been graded to match the Street B entrance elevations at Highway 6, and the property boundaries along the north, south, east and west portions of the site.

Internal roadways are graded with slopes ranging from 0.6% to 1.5%, while lots are generally graded with slopes ranging from 2% to 4%. The proposed lot grading patterns generally consists of split-drainage lots and back to front draining lots. 3:1 transition slopes are proposed in rear yard areas of select lots to accommodate the grade relief across the site.

3.2. Streets

The internal local roadways will be constructed as 20-23 m wide urban cross sections complete with concrete curb and gutter per Township of Centre Wellington Standards. The Street B right-of-way connection at St. David Street N (Highway No. 6) will be 26 m in width.

3.3. Water Supply

The proposed development will be serviced by extending a watermain along St. David Street N (Highway No. 7) in the westerly direction to the site entrance followed by which a local watermain will be extended throughout the site via the internal road network. The proposed watermain sizing will be completed as part of the detail design of the site once Draft Plan approval has been received.

Domestic water demands for the proposed development are calculated in Table 1 below.

Table No. 1: Domestic Water Demand Requirements

Unit Type	Population	Average Day (350 L/p/d)	Min Hour (Factor = 0.40)	Max Day (Factor = 2.75)	Max Hour (Factor = 4.13)
88 Single Family Lots (at 2.8 persons/lot)	246	1.00 L/s	0.40 L/s	2.75 L/s	4.13 L/s
118 On-Street Townhome Units (at 2.5 persons per lot)	295	1.20 L/s	0.48 L/s	3.30 L/s	4.96 L/s
102 Mixed Use / Medium Density Units – (at 2.5 persons per unit)	255	1.03 L/s	0.41 L/s	2.83 L/s	4.25 L/s
1 Existing Single Family Lot (at 2.8 persons/lot)	3	0.01 L/s	0.004 L/s	0.03 L/s	0.04 L/s
Total On-site Domestic Demands	799	3.24 L/s	1.29 L/s	8.91 L/s	13.38 L/s

Note: Population has been rounded to the nearest whole number.

A 25mm diameter water service lateral will be provided for each dwelling. Fire hydrants will be installed at a minimum radius of 150m in accordance with Township of Centre Wellington Development Manual.

The proposed watermain network layout is shown on the Servicing Plans.

There is an existing 300mm diameter watermain located on the east side of St. David Street North / Highway No. 6, which extends across a portion of the frontage of the subject lands, before terminating on the south side of Sideroad 18. The extension of a watermain from the existing 300mm watermain would provide adequate domestic and fire flow protection to the +/- 19.39-hectare development lands. Through discussions with the Township of Centre Wellington and Triton Engineering Services Limited, the existing 300mm diameter watermain has sufficient capacity to service these lands. The Township of Centre Wellington also confirmed that they are currently undertaking a Municipal Class Environmental Assessment (EA) to identify potential supply well location(s), to ensure that sufficient water supply is available to accommodate the additional demand resulting from the lands to be included within the Township's municipal boundary as part of the MCR (Municipal Comprehensive Review) process. Therefore, from a water supply and watermain servicing perspective, there are minimal works required to support the development of this property lands.

3.4. Sanitary Sewer

Each dwelling will be serviced via a proposed 100 mm diameter sanitary service lateral per Township of Centre Wellington Development Manual. Sanitary sewer design calculations have been attached as Appendix B. The sanitary sewer layout is shown on the Servicing Plans.

There is a recently constructed 300mm diameter sanitary sewer on the east side of St. David Street North / Highway No. 6, which has been terminated just south of Sideroad 18. Since this existing 300mm diameter sanitary sewer extends across a portion of the frontage of the subject lands, the extension of a

sanitary sewer from the existing 300mm diameter sanitary would provide a gravity sanitary sewer outlet for the +/- 19.39-hectare development. Per our correspondence with the Township of Centre Wellington and Triton Engineering Services Limited, there is sufficient capacity in the existing downstream sanitary sewer system and the downstream wastewater treatment plan (WWTP) to service these lands. This is based on our understanding that the planned upgrades to the WWTP, which are scheduled to occur in 2029, will ensure that sufficient treatment capacity exists for the lands to be included within the Township's municipal boundary as part of the MCR (Municipal Comprehensive Review) process. Therefore, from a sanitary sewer servicing perspective, there are minimal works required to support the development of this property lands and the lands can be efficiently and cost effectively serviced via a gravity connection to an existing sanitary sewer.

3.5. Storm Sewer

The storm sewer system on the internal roads will be sized to convey the 5-year design storm to the stormwater management facility per the Township of Centre Wellington Development Manual. Major storm events will be conveyed overland through the municipal rights-of-way to the stormwater management facility. Storm sewer design calculations have been attached as Appendix B. The stormwater management facility will outlet to the wetland along the northeast limits of the site to maintain existing drainage patterns.

Each lot will have a proposed 100 mm diameter storm service lateral connected to the proposed storm sewer system in the municipal right-of-way. Foundation drainage will be provided via sump pump discharge to the storm service lateral.

4. Stormwater Management Criteria

The studies, policies and guidelines used to develop the stormwater management plan are as follows:

- 1) The Stormwater Management Practices Planning and Design Manual, 1994
- 2) Stormwater Management Planning and Design Manual, 2003
- 3) The Interim Stormwater Quality Control Guidelines, 1991
- 4) The Stormwater Quality Best Management Practices Manual, 1991
- 5) The MTO Drainage Management Technical Guidelines, 1989
- 6) The Ontario Urban Drainage Design Guidelines, 1987
- 7) Low Impact Development Stormwater Management Planning and Design Guide, 2010

The stormwater management criteria are as follows:

- 1) Post-development flow rates for the site must be controlled to existing conditions rates for the 2 to 100 year design storm events.
- 2) Provide Enhanced level of quality control (80% Total Suspended Solids (TSS) removal) from all runoff discharging from the site.
- 3) Volume control performance should be evaluated for the 25mm storm event or through continuous modelling.
- 4) All efforts should be made to maximize infiltration wherever soil conditions allow.
- 5) Provide extended detention storage for the 25mm storm event.

The method used to evaluate and design the stormwater management plan is as follows:

The Fergus Shand Dam rainfall parameters presented in the Stormwater Management Master Plan for Centre Wellington (Elora, Salem and Fergus) (wsp Group, dated April 9, 2024) were used to generate the mass rainfall data for a 4-hour duration rainfall event for the full range of design storms (2 to 100-year). The 25mm storm for a 2-hour duration is also included within the table below. The Chicago storm parameters and the total depth of rainfall for each storm are as follows:

Table No. 2: Fergus Shand Dam - Chicago Storm Parameters

Parameter	25mm	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
a =	367.000	414.876	544.711	627.308	746.059	820.361	901.088
b =	5.000	0.0268	0.0206	0.0136	0.0851	0.0100	0.0426
c =	0.700	0.682	0.686	0.687	0.692	0.691	0.692
r =	0.394	0.375	0.375	0.375	0.375	0.375	0.375
td =	120.00	240.00	240.00	240.00	240.00	240.00	240.00
Rainfall depth (mm)	24.995	39.504	50.743	58.119	67.239	74.358	81.221

The Regional Storm (Hurricane Hazel) was also modelled.

The Horton infiltration method was used in the runoff calculations.

Table No. 3: MIDUSS – Horton Infiltration Parameters

Parameter	Impervious Areas	Pervious Areas
Maximum Infiltration (mm/hr)	0.0	30.0
Minimum Infiltration (mm/hr)	0.0	5.0
Lag Constant (hr)	0.0	0.25
Depression Storage (mm)	1.5	5.0

The hydrologic model MIDUSS was used to create the runoff hydrographs and to route the flows through the storage structures.

5. Stormwater Management Plan

The stormwater management design for the development accounts for the proposed development as well as for the future development of the adjacent lands also owned by the applicant in order to size the stormwater management facility for the future ultimate buildout of the second property. Interim Post-Development Conditions refers to the current proposed development and Ultimate Post-Development Conditions will refer to the future buildout of the adjacent property and how it will contribute to the proposed development.

5.1. Existing Conditions

For existing conditions analysis purposes, the site was modelled as four (4) drainage catchments. The existing conditions drainage catchments are shown on Figure 3 and described below. The existing conditions MIDUSS computer modelling is attached in Appendix C.

Catchment 10 (31.11 hectares, 2% impervious) represents the majority of the site. Runoff generated from Catchment 10 sheetflows east to the wetland along the northeast limits of the site.

Catchment 20 (2.98 hectares, 0% impervious) represents the westerly portion of the site. Runoff generated from Catchment 20 sheetflows overland in the westerly direction to the adjacent farm field and an offsite wetland.

Catchment 30 (2.00 hectares, 5% impervious) represents the southwesterly portion of the site. Runoff generated from Catchment 30 sheetflows overland to the roadside ditch in the Highway 6 right-of-way which then continues to sheetflow to an offsite regulated watercourse.

Catchment 40 (3.33 hectares, 0% impervious) represents the northeast portion of the site consisting of an existing wetland. Runoff generated from Catchment 40 contributes to the wetland extending north and east past the limits of the site.

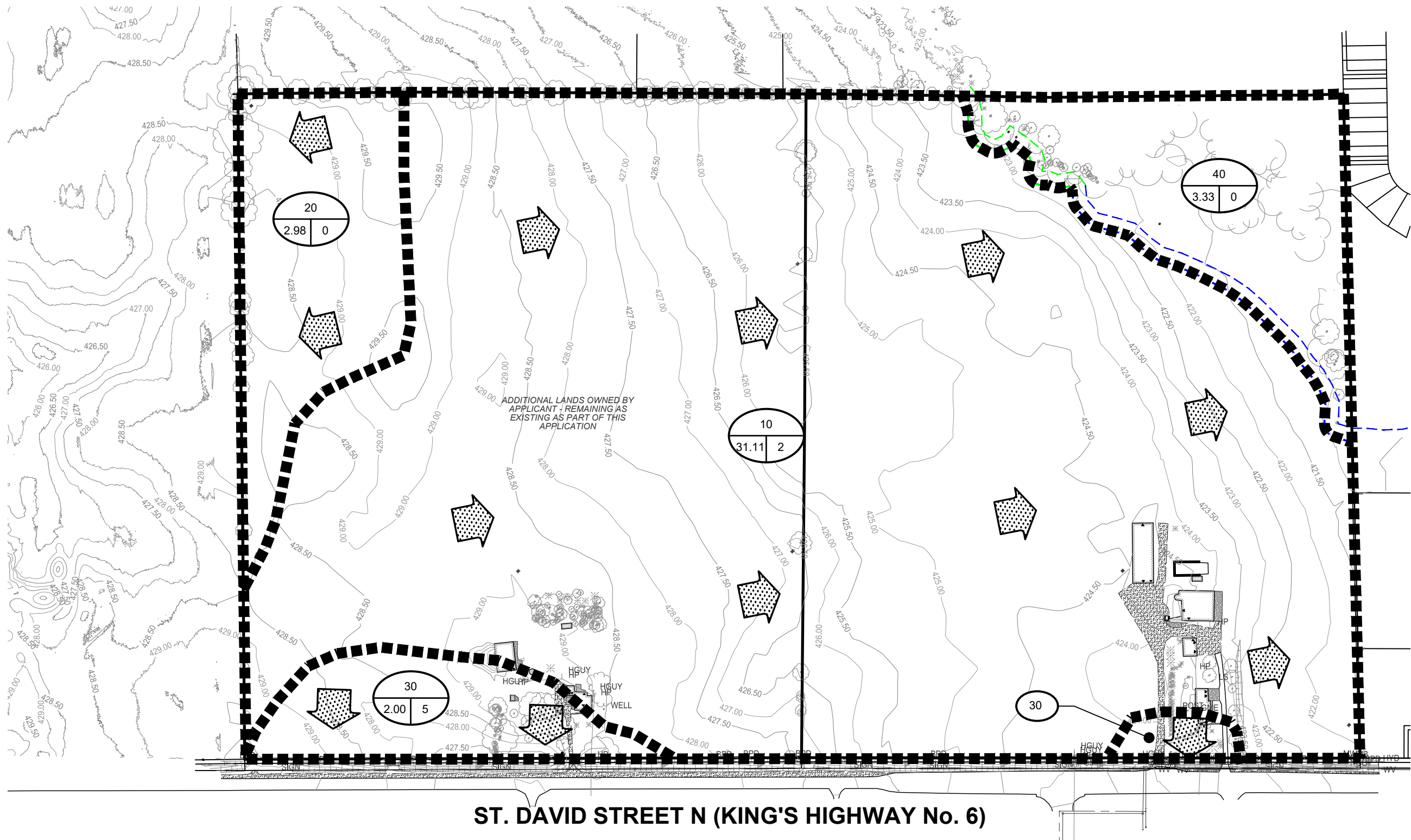


Table No. 4 lists the flow rates discharging from each catchment under existing conditions.

Table No. 4: Existing Conditions Flow Rates

	25 mm (m³/s)	2-Year (m³/s)	5-Year (m³/s)	10-Year (m³/s)	25-Year (m³/s)	50-Year (m³/s)	100-Year (m³/s)	Regional Storm (m³/s)
Catchment 10 – to Northeast Wetland	0.436	1.519	2.658	3.519	4.835	5.783	6.563	3.396
Catchment 20 – to Farm Field West of Site	0.049	0.169	0.317	0.405	0.532	0.633	0.734	0.327
Catchment 30 – to Highway 6	0.058	0.188	0.332	0.437	0.574	0.670	0.768	0.211
Catchment 40 – Northeast Wetland	0.056	0.193	0.356	0.455	0.607	0.720	0.835	0.366
Total Flow Rate	0.561	1.947	3.346	4.608	6.178	7.296	8.263	4.283

5.2. Stormwater Management Overview

In line with current practices and guidelines, the stormwater management approach for the North Lands Subdivision is designed as a “treatment train” to remove sediments and any absorbed contaminants prior to the discharge of runoff from the development to the receiving outlets. The “treatment train” approach will include a combination of lot level, conveyance and end-of-pipe best management practices and is proposed to filter and remove sediments from stormwater runoff prior to discharging off-site.

Lot Level Controls

Stormwater management practices recommended for providing lot level controls on this site are as follows:

a) Rooftop Infiltration

Each lot will have a rear yard infiltration gallery designed to infiltrate the 25 mm storm runoff from the proposed rooftop. The gallery connection to the roof downspout will include a splash pad and overflow for storm events greater than the 25 mm storm to discharge to ground surface followed by which the roof runoff will be directed to the grassed areas of the lot. The runoff for any event large enough to generate flow to the sewer system will be adequately filtered by the grass.

Design considerations that will be implemented in the infiltration galleries’ designs include:

- Located beneath frost penetration depth and minimum of 4 metres away from building foundations
- A 100-150mm diameter perforated vertical standpipe for inspection and flushing
- Leaf screens on downspouts
- 50mm clear stone with 30 to 40% void space

- Geotextile installed around the reservoir which considers their percent open area, load bearing ratio, and the texture and permeability of native soils

b) Rear Yard Swales

The grading of the lots will be to current Township of Centre Wellington Design Standards. Where practical, the length of the rear lot swales between catchbasins will be increased to extend the contact time with the grassed surfaces.

To promote more infiltration on the lots and in the swales, it is recommended that the average depth of graded topsoil be 300 mm.

c) Foundation Drainage

Foundation drainage will be provided for each lot via sump pumps discharging to storm service laterals.

Conveyance Controls

Conveyance controls will be achieved through municipal maintenance of the storm sewer system. The regular cleanout of the manholes and catchbasin sumps will remove the heavier sediments deposited from the runoff during storm events.

End of Pipe Facilities

The end-of-pipe component for Catchments 1000 and 2000 consists of the proposed stormwater management facility located near the south-easterly edge of the property, adjacent to the existing wetland and Highway 6 (St. David Street N). The stormwater management facility will have two (2) outlet structures. Outlet Structure No. 1 consists of a 1200mm diameter double ditch inlet catchbasin with a 200mm diameter minor flow orifice and a 600mm pipe outlet, which will discharge to the wetland along the northeast limits of the site. Outlet Structure No. 2 consists of a 1200mm diameter double ditch inlet catchbasin with a 525mm pipe outlet, which will discharge to the wetland along the northeast limits of the site.

The proposed stormwater management facility has been designed as wetland type facility complete with a forebay and a 0.3 m deep permanent pool to provide the required water quality controls. The proposed outlet structure is designed to provide a 48-hour extended detention of the 4-hour 25 mm design storm event as per the Township of Centre Wellington requirements.

Water Quality

The proposed stormwater management facility has been designed to function as a wetland. From Table 3.2, Stormwater Management Planning and Design Manual, 2003, in order to provide Enhanced water quality treatment, a wetland facility requires 128 m³/ha of storage volume for a contributing drainage area that is 76% impervious. 40 m³/ha of the required storage volume is extended detention volume, while the remaining 88 m³/ha is permanent pool.

Based on a contributing site area of 33.57 hectares (Catchments 1000 and 2000 in ultimate post-development conditions) and a requirement for 88 m³/ha of permanent pool storage volume to achieve Enhanced treatment, the required permanent pool storage is 2,954 m³.

The proposed stormwater management facility has been designed with a 0.3-metre-deep permanent pool, which provides 3,003 m³ of permanent pool volume. An additional permanent pool volume of 875 m³ will be provided in the sediment forebay.

Extended Detention

Extended detention volume is calculated based on the runoff volume generated by the 4-hour 25 mm design storm event. The outlet structure has been designed to provide a 51-hour detention of the required extended detention volume, which corresponds to a release rate of 0.043 m³/s.

Drawdown calculations for the 4-hour 25 mm storm event are included in **Appendix C**.

5.3. Interim Post-Development Conditions

For analysis of interim post-development conditions, the site was modelled as eight (8) drainage catchments. The interim condition drainage catchments are shown on Figure 4 and described below. The post-development MIDUSS computer modelling is attached in Appendix C.

Catchment 100 (13.09 hectares, 80% impervious) represents the majority of the currently proposed development. Runoff generated from Catchment 100 will be captured and conveyed to the proposed stormwater management facility via on-site storm sewers.

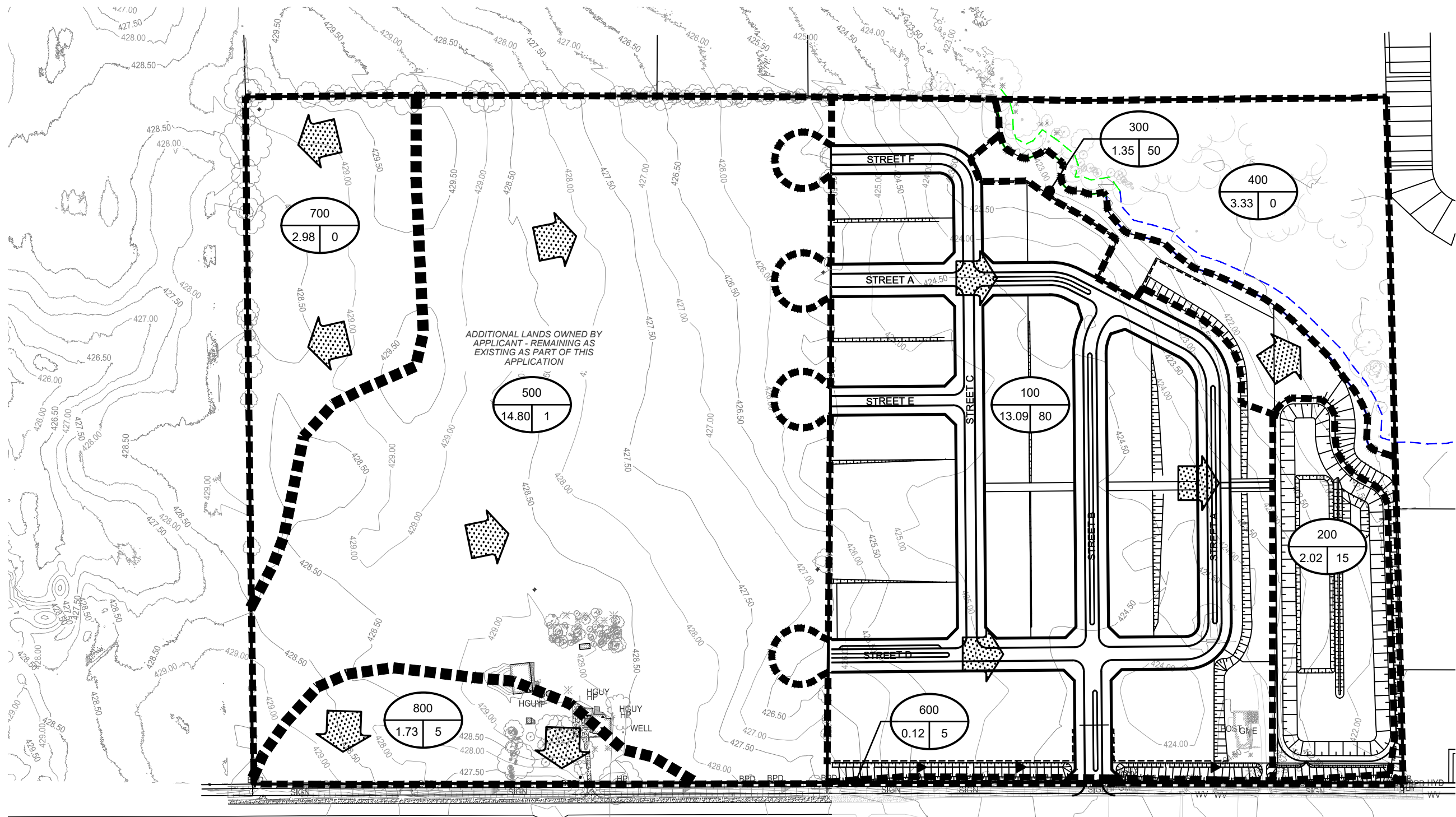
Catchment 200 (2.02 hectares, 15% impervious) represents the proposed stormwater management facility. The proposed stormwater management facility is designed to provide the required Enhanced level of protection prior to discharging to the wetland along the northeast limits of the site.

Catchment 300 (1.35 hectares, 50% impervious) represents a portion of the proposed development adjacent to the northeast wetland. Runoff generated from Catchment 300 will sheetflow overland, uncontrolled, to the northeast wetland.

Catchment 400 (3.33 hectares, 0% impervious) represents the northeast portion of the site consisting of an existing wetland. Runoff generated from Catchment 400 contributes to the wetland extending north and east past the limits of the site.

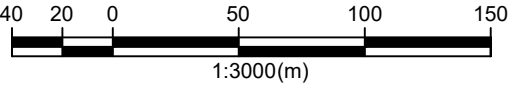
Catchment 500 (14.80, 1% impervious) represents the majority of the future development which will be constructed under ultimate post-development conditions. Runoff generated from Catchment 500 will sheetflow overland east, ultimately discharging to the proposed stormwater management facility.

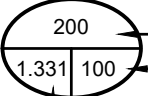
Catchment 600 (0.12 hectares, 5% impervious) represents a portion of the proposed development which will be constructed under interim conditions, adjacent to the Highway 6 right-of-way. Runoff generated from Catchment 600 will sheetflow overland to the roadside ditch on Highway 6 right-of-way, ultimately discharging to a regulated watercourse.



ST. DAVID STREET N (KING'S HIGHWAY No. 6)

NOTE:
EXISTING EXTERNAL CONTOUR INFORMATION
RETRIEVED FROM THE ONTARIO GEOHUB DIGITAL
TERRAIN MODEL (LIDAR-DERIVED) ON 2024-08-19



LEGEND	 CATCHMENT BOUNDARY	 MAJOR OVERLAND FLOW		CATCHMENT NUMBER	% IMPERVIOUS	CATCHMENT AREA IN HECTARES	FERGUS SUBDIVISION - SOUTH LANDS TOWNSHIP OF CENTRE WELLINGTON (FERGUS)		INTERIM POST-DEVELOPMENT DRAINAGE AREAS
							POLOCORP		
							Project 2401807	FEBRUARY 2025	FIGURE No. 4

Catchment 700 (2.98, 0% impervious) represents a westerly portion of the future development area and reflects pre-development conditions. Runoff generated from Catchment 700 sheetflows overland in the westerly direction to the adjacent farm field and an offsite wetland.

Catchment 800 (1.73, 5% impervious) represents a southwesterly portion of the site which will be developed under ultimate post-development conditions. Runoff generated from Catchment 800 sheetflows overland to the roadside ditch in the Highway 6 right-of-way which then continues to sheetflow to and offsite regulated watercourse.

5.3.1. Routing – Interim Post-Development Conditions

Table No. 5 lists the post-development uncontrolled flow rates for each catchment under the 25mm to 100-year design storms and Regional Storm.

Table No. 5: Interim Post-Development Uncontrolled Flow Rates

	25 mm (m³/s)	2-Year (m³/s)	5-Year (m³/s)	10-Year (m³/s)	25-Year (m³/s)	50-Year (m³/s)	100-Year (m³/s)	Regional Storm (m³/s)
Catchment 100	1.552	2.700	3.616	4.219	5.040	5.638	6.208	1.584
Catchment 200	0.056	0.170	0.279	0.383	0.509	0.595	0.686	0.210
Catchment 300	0.121	0.228	0.347	0.424	0.525	0.597	0.665	0.165
Catchment 400	0.056	0.193	0.356	0.455	0.607	0.720	0.835	0.366
Catchment 500	0.129	0.449	0.818	1.110	1.530	1.817	2.059	1.470
Catchment 600	0.007	0.022	0.035	0.043	0.052	0.058	0.063	0.014
Catchment 700	0.044	0.152	0.271	0.386	0.500	0.575	0.652	0.327
Catchment 800	0.050	0.163	0.287	0.378	0.496	0.580	0.664	0.182
Total Flow Rate	1.751	3.235	4.559	5.501	6.845	7.802	8.737	3.860

Table No. 6 compares the routing results through the stormwater management facility with the available stage/storage/ discharge capacities.

Table No. 6: Stormwater Management Facility – Stage/Storage/Discharge Comparison

	Available Capacity			Actual Capacity Used		
	Peak Flow m ³ /s	Storage Volume m ³	Storage Elevation m	Peak Flow m ³ /s	Storage Volume m ³	Storage Elevation m
Outlet Structure No. 1	0.000	0	421.50	--	--	--
25 mm Storm	--	--	--	0.019	3,398	421.81
T/G DICB.1	0.026	5,717	422.00	--	--	--
2 Year Storm	--	--	--	0.046	6,286	422.05
5 Year Storm	--	--	--	0.197	8,304	422.20
10 Year Storm	--	--	--	0.323	9,355	422.28
T/G DICB.2	0.352	9,602	422.30	--	--	--
25 Year Storm	--	--	--	0.398	10,987	422.40
50 Year Storm	--	--	--	0.501	12,188	422.49
100 Year Storm	--	--	--	0.681	13,175	422.56
Weir	0.958	15,198	422.70	--	--	--
Regional Storm	--	--	--	2.741	18,043	422.89
Top of Stormwater Management Facility	8.746	22,853	423.20	--	--	--

Table No. 7: Interim Post-Development Condition Controlled Flow Rates

	25 mm (m³/s)	2-Year (m³/s)	5-Year (m³/s)	10-Year (m³/s)	25-Year (m³/s)	50-Year (m³/s)	100-Year (m³/s)	Regional Storm (m³/s)
Catchment 600 (uncontrolled)	0.007	0.022	0.035	0.043	0.052	0.058	0.063	0.014
Catchment 800 (uncontrolled)	0.050	0.163	0.287	0.378	0.496	0.580	0.664	0.182
<i>To Highway 6 Roadside Ditch</i>	<i>0.052</i>	<i>0.167</i>	<i>0.305</i>	<i>0.398</i>	<i>0.519</i>	<i>0.604</i>	<i>0.691</i>	<i>0.196</i>
Catchment 100, 200 and 500 (controlled)	0.019	0.046	0.197	0.323	0.398	0.501	0.681	2.741
Catchment 300 (uncontrolled)	0.121	0.228	0.347	0.424	0.525	0.597	0.665	0.165
Catchment 400 (uncontrolled)	0.056	0.193	0.356	0.455	0.607	0.720	0.835	0.366
<i>To Northeast Wetland</i>	<i>0.127</i>	<i>0.266</i>	<i>0.442</i>	<i>0.560</i>	<i>0.756</i>	<i>0.893</i>	<i>1.033</i>	<i>3.222</i>
Catchment 700 (uncontrolled)	0.044	0.152	0.271	0.386	0.500	0.575	0.652	0.327
<i>To West Farm Field</i>	<i>0.044</i>	<i>0.152</i>	<i>0.271</i>	<i>0.386</i>	<i>0.500</i>	<i>0.575</i>	<i>0.652</i>	<i>0.327</i>
Total Flow Rate	0.169	0.518	0.892	1.160	1.575	1.860	2.153	3.726

Tables No. 8-11 below compares the existing and post-development flow rates from the site to Highway 6 (St. David Street N) and to the wetland northeast of the site.

Table No. 8: Comparison of Existing and Post-Development Flows - to Highway 6 (St. David Street N)

Design Storm	Existing Conditions		Controlled Post-Development Conditions	
	Flow Rate (m ³ /s)	Volume (m ³)	Flow Rate (m ³ /s)	Volume (m ³)
25 mm	0.058	138.6	0.052	127.9
2-Year	0.188	305.6	0.167	282.3
5-Year	0.332	496.7	0.305	458.8
10-Year	0.437	625.8	0.398	578.3
25-Year	0.574	799.5	0.519	738.5
50-Year	0.670	935.7	0.604	864.2
100-Year	0.768	1,066.8	0.691	985.1
Regional	0.211	3,007.4	0.196	2,761.3

Table No. 9: Comparison of Existing and Post-Development Flows - to Northeast Wetland

Design Storm	Existing Conditions (m ³ /s)	Controlled Post-Development (m ³ /s)
25 mm	0.489	0.127
2-Year	1.700	0.266
5-Year	2.963	0.442
10-Year	3.974	0.560
25-Year	5.416	0.756
50-Year	6.448	0.893
100-Year	7.319	1.033
Regional	3.762	3.222

Table No. 10: Comparison of Existing and Post-Development Flows - to West Farm Field

Design Storm	Existing Conditions (m ³ /s)	Controlled Post-Development (m ³ /s)
25 mm	0.049	0.044
2-Year	0.169	0.152
5-Year	0.317	0.271
10-Year	0.405	0.386
25-Year	0.532	0.500
50-Year	0.633	0.575
100-Year	0.734	0.652
Regional	0.327	0.327

Table No. 11: Comparison of Existing and Post-Development Flows - Totals from the Site

Design Storm	Existing Conditions (m ³ /s)	Uncontrolled Post-Development (m ³ /s)	Controlled Post-Development (m ³ /s)
25 mm	0.561	1.751	0.169
2-Year	1.947	3.235	0.518
5-Year	3.346	4.559	0.892
10-Year	4.608	5.501	1.160
25-Year	6.178	6.845	1.575
50-Year	7.296	7.802	1.860
100-Year	8.263	8.737	2.153
Regional	4.283	3.860	3.726

5.4. Ultimate Post-Development Conditions

For ultimate post-development analysis purposes, the site was modelled as seven (7) drainage catchments. The post-development drainage catchments are shown on Figure 5 and described below. The post-development MIDUSS computer modelling is attached in Appendix C.

Catchment 1000 (31.55 hectares, 80% impervious) represents the majority of the development. Runoff generated from Catchment 1000 will be captured and conveyed to the proposed stormwater management facility via on-site storm sewers.

Catchment 2000 (2.02 hectares, 15% impervious) represents the proposed stormwater management facility. The proposed stormwater management facility is designed to provide the required Enhanced level of protection prior to discharging to the wetland along the northeast limits of the site.

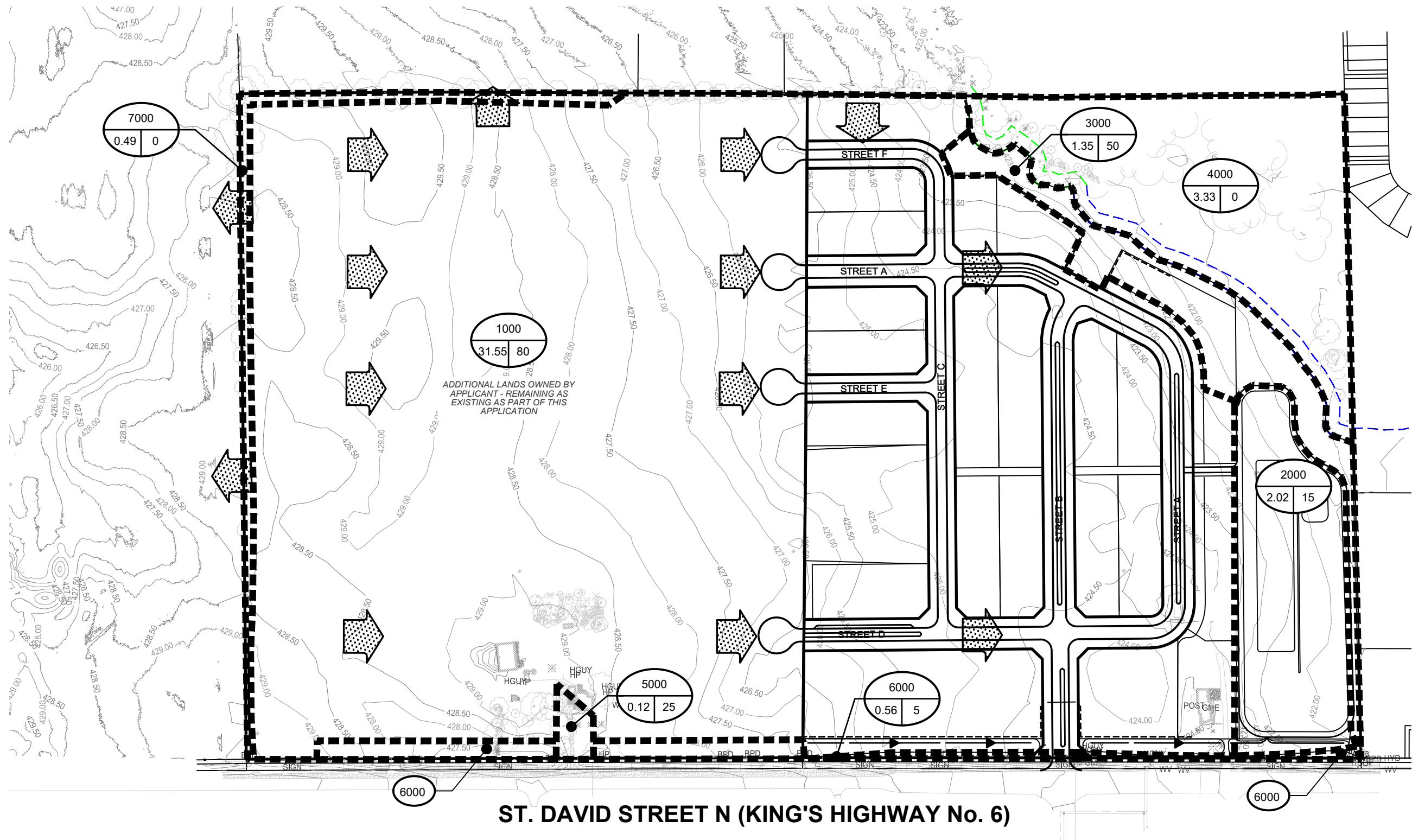
Catchment 3000 (1.35 hectares, 50% impervious) represents a portion of the proposed development adjacent to the northeast wetland. Runoff generated from Catchment 3000 will sheetflow overland, uncontrolled, to the northeast wetland.

Catchment 4000 (3.33 hectares, 0% impervious) represents the northeast portion of the site consisting of an existing wetland. Runoff generated from Catchment 4000 contributes to the wetland extending north and east past the limits of the site.

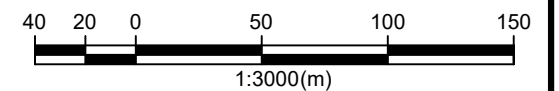
Catchment 5000 (0.12 hectares, 25% impervious) represents the front yard of the existing houses on site. Runoff generated from Catchment 5000 will sheetflow overland to the roadside ditch on Highway 6 right-of-way, ultimately discharging to a regulated watercourse.

Catchment 6000 (0.56 hectares, 5% impervious) represents a portion of the proposed development adjacent to the Highway 6 right-of-way. Runoff generated from Catchment 6000 will sheetflow overland to the roadside ditch on Highway 6 right-of-way, ultimately discharging to a regulated watercourse.

Catchment 7000 (0.49 hectares, 0% impervious) represents a northwest portion of the proposed development consisting of rooftops and rear yards. Runoff generated from Catchment 7000 will sheetflow overland west to the adjacent farm field, ultimately discharging to an offsite wetland.



NOTE:
EXISTING EXTERNAL CONTOUR INFORMATION
RETRIEVED FROM THE ONTARIO GEOHUB DIGITAL
TERRAIN MODEL (LIDAR-DERIVED) ON 2024-08-19



LEGEND

- CATCHMENT BOUNDARY
- MAJOR OVERLAND FLOW
- | | |
|-------------|-------------------------------|
| 200 | CATCHMENT NUMBER |
| 1.331 100 | % IMPERVIOUS |
| | CATCHMENT AREA
IN HECTARES |

FERGUS SUBDIVISION - SOUTH LANDS
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)

POLOCORP



ULTIMATE POST-DEVELOPMENT
DRAINAGE AREAS

Project 2401807

FEBRUARY 2025 FIGURE No. 5

5.4.1. Routing – Ultimate Post-Development Conditions

Table No. 12 lists the post-development uncontrolled flow rates for each catchment under the 2 to 100-year design storms and Regional Storm.

Table No. 12: Post-Development Uncontrolled Flow Rates

	25 mm (m³/s)	2-Year (m³/s)	5-Year (m³/s)	10-Year (m³/s)	25-Year (m³/s)	50-Year (m³/s)	100-Year (m³/s)	Regional Storm (m³/s)
Catchment 1000	3.692	6.428	8.626	10.093	12.028	13.467	14.844	3.800
Catchment 2000	0.056	0.170	0.279	0.383	0.509	0.595	0.686	0.210
Catchment 3000	0.121	0.228	0.347	0.424	0.525	0.597	0.665	0.165
Catchment 4000	0.056	0.193	0.356	0.455	0.607	0.720	0.835	0.366
Catchment 5000	0.005	0.009	0.016	0.022	0.029	0.034	0.039	0.013
Catchment 6000	0.032	0.105	0.163	0.198	0.242	0.272	0.296	0.065
Catchment 7000	0.025	0.082	0.136	0.169	0.210	0.239	0.261	0.056
Total Flow Rate	3.901	6.995	9.548	11.267	13.566	15.259	16.873	4.594

Table No. 13 compares the routing results through the stormwater management facility with the available stage/storage/ discharge capacities.

Table No. 13: Stormwater Management Facility – Stage/Storage/Discharge Comparison

	Available Capacity			Actual Capacity Used		
	Peak Flow m ³ /s	Storage Volume m ³	Storage Elevation m	Peak Flow m ³ /s	Storage Volume m ³	Storage Elevation m
Outlet Structure No. 1	0.000	0	421.50	--	--	--
T/G DICB.1	0.026	5,717	422.00	--	--	--
25 mm Storm	--	--	--	0.043	6,205	422.04
2 Year Storm	--	--	--	0.260	8,828	422.24
T/G DICB.2	0.352	9,602	422.3	--	--	--
5 Year Storm	--	--	--	0.407	11,095	422.41
10 Year Storm	--	--	--	0.562	12,581	422.52
25 Year Storm	--	--	--	0.835	14,092	422.62
Weir	0.958	15,198	422.70	--	--	--
50 Year Storm	--	--	--	1.045	15,395	422.71
100 Year Storm	--	--	--	1.445	16,290	422.77
Regional Storm	--	--	--	3.326	18,929	422.95
Top of Stormwater Management Facility	8.746	22,853	423.20	--	--	--

Table No. 14: Post-Development Controlled Flow Rates

	25 mm (m³/s)	2-Year (m³/s)	5-Year (m³/s)	10-Year (m³/s)	25-Year (m³/s)	50-Year (m³/s)	100-Year (m³/s)	Regional Storm (m³/s)
Catchment 5000 (uncontrolled)	0.005	0.009	0.016	0.022	0.029	0.034	0.039	0.013
Catchment 6000 (uncontrolled)	0.032	0.105	0.163	0.198	0.242	0.272	0.296	0.065
<i>To Highway 6 Roadside Ditch</i>	<i>0.037</i>	<i>0.114</i>	<i>0.177</i>	<i>0.216</i>	<i>0.265</i>	<i>0.300</i>	<i>0.328</i>	<i>0.078</i>
Catchment 1000 and 2000 (controlled)	0.043	0.260	0.407	0.562	0.835	1.045	1.445	3.326
Catchment 4000 (uncontrolled)	0.056	0.193	0.356	0.455	0.607	0.720	0.835	0.366
Catchment 3000 (uncontrolled)	0.121	0.228	0.347	0.424	0.525	0.597	0.665	0.165
<i>To Northeast Wetland</i>	<i>0.132</i>	<i>0.296</i>	<i>0.687</i>	<i>0.907</i>	<i>1.185</i>	<i>1.561</i>	<i>1.866</i>	<i>3.807</i>
Catchment 7000 (uncontrolled)	0.025	0.082	0.136	0.169	0.210	0.239	0.261	0.056
<i>To West Farm Field</i>	<i>0.025</i>	<i>0.082</i>	<i>0.136</i>	<i>0.169</i>	<i>0.210</i>	<i>0.239</i>	<i>0.261</i>	<i>0.056</i>
Total Flow Rate	0.173	0.473	0.755	0.975	1.292	1.643	1.932	3.902

Comparison to Existing Conditions Flows

Tables No. 15-18 below compares the existing and post-development flow rates from the site to Highway 6 (St. David Street N) and to the wetland northeast of the site.

Table No. 15: Comparison of Existing and Post-Development Flows - to Highway 6 (St. David Street N)

Design Storm	Existing Conditions		Controlled Post-Development Conditions	
	Flow Rate (m³/s)	Volume (m³)	Flow Rate (m³/s)	Volume (m³)
25 mm	0.058	138.6	0.037	49.6
2-Year	0.188	305.6	0.114	107.5
5-Year	0.332	496.7	0.177	171.9
10-Year	0.437	625.8	0.216	216.4
25-Year	0.574	799.5	0.265	273.5
50-Year	0.670	935.7	0.300	318.3
100-Year	0.768	1,066.8	0.328	361.6
Regional	0.211	3,007.4	0.078	951.2

Table No. 16: Comparison of Existing and Post-Development Flows - to Northeast Wetland

Design Storm	Existing Conditions (m ³ /s)	Controlled Post-Development Conditions (m ³ /s)
25 mm	0.436	0.132
2-Year	1.519	0.296
5-Year	2.658	0.687
10-Year	3.519	0.907
25-Year	4.835	1.185
50-Year	5.783	1.561
100-Year	6.563	1.866
Regional	3.396	3.807

Table No. 17: Comparison of Existing and Post-Development Flows - to West Farm Field

Design Storm	Existing Conditions (m ³ /s)	Controlled Post-Development (m ³ /s)
25 mm	0.049	0.025
2-Year	0.169	0.082
5-Year	0.317	0.136
10-Year	0.405	0.169
25-Year	0.532	0.210
50-Year	0.633	0.239
100-Year	0.734	0.261
Regional	0.327	0.056

Table No. 18: Comparison of Existing and Post-Development Flows - Totals from the Site

Design Storm	Existing Conditions (m ³ /s)	Uncontrolled Post-Development (m ³ /s)	Controlled Post-Development (m ³ /s)
25 mm	0.561	3.901	0.173
2-Year	1.947	6.995	0.473
5-Year	3.346	9.548	0.755
10-Year	4.608	11.267	0.975
25-Year	6.178	13.566	1.292
50-Year	7.296	15.259	1.643
100-Year	8.263	16.873	1.932
Regional	4.283	4.594	3.902

Therefore, the post-development flow rates discharging from the site during the 2 to 100-year design storm events are less than the existing conditions flow rates from the site. The flow rate during the Regional Storm has increased under post development conditions. The Regional Storm will be conveyed overland through the site at each of the outlet locations summarized in the table above.

Sediment Forebay Design

The proposed stormwater management facility has been designed with one sediment forebay located at the facility inlet. The sediment forebay is 1.0 m deep and has been designed per the Ministry of Environment Stormwater Management Planning and Design Manual guidelines. The full sediment forebay sizing information has been included in Appendix C.

Table No. 19 summarizes the required and provided parameters within the sediment forebay design.

Table No. 19: Sediment Forebay Design Details

Required	Dispersion Length (m)	138.0
	Settling Length (m)	27.3
	Flow Velocity (m/s)	0.15
	Length to Width Ratio	2:1
	Settling Velocity (m/s)	0.0003
Provided	Forebay Length (m)	140
	Flow Velocity (m/s)	0.15
	Length to Width Ratio	5:1

Therefore, the sediment forebays have been designed to provide the required dispersion and flow lengths.

Sediment Loading and Cleanout Frequency

Table No. 20 illustrates sediment loading to the sediment forebay as well as the subsequent cleanout frequency required to maintain this system.

Table No. 20: Sediment Loading and Cleanout Frequency – Sediment Forebays

Catchment Area	Imp. (%)	Annual Sediment Loading	TSS Removal	Annual TSS Reduction	Storage Volume	Cleanout Frequency
33.57 ha	76%	104.1 m ³ (based on 3.1 m ³ /ha)	80%	83.3 m ³	292 m ³ (1/3 of forebay)	~ 3.5 years

Sediment loadings obtained from Table 6.3 of the MOE Stormwater Management Planning and Design Manual, 2003 and prorated based on catchment percent impervious.

Therefore, it is estimated that the sediment forebay will require cleaning every 3 years.

Thermal Mitigation

The proposed stormwater management facility has been designed to function as a wetland complete with a reverse draw from the deep pool portion of the facility. The reverse draw has been designed for the 4-hour 25 mm storm event to allow cooler water to be discharged from the facility under the quality storm event per the Stormwater Management Planning and Design Manual guidelines. The reverse draw outlet consists of a 200 mm diameter pipe with an obvert depth of 1.2 m below the permanent pool elevation and a deep pool bottom depth of 0.9 m below the reverse draw outlet to allow for permanent pool sediment build-up and 0.5 m freeboard from the sediment level per the criteria set out in the Data Synthesis and Design Considerations for Stormwater Thermal Mitigations Measures.

In addition to the reverse draw from the deep pool portion of the proposed stormwater management facility, it is recommended that the landscape design of the facility includes plantings along the permanent pool, outlet structure and banks that help shade the facility and mitigate the thermal impacts of the development.

Major Flow Conveyance

The anticipated major flows on the right-of-way are the 100-year inflows to the stormwater management facility minus the runoff that will be captured and conveyed by on-site storm sewers, which have been designed for the 5-year design storm event, to the stormwater management facility. The major overland flows are then approximately $6.128 \text{ m}^3/\text{s}$ ($14.628 \text{ m}^3/\text{s} - 8.500 \text{ m}^3/\text{s}$) and split evenly into two directions ($3.064 \text{ m}^3/\text{s}$) through the subdivision until the access path to the stormwater management facility. The proposed 23m right-of-way, with standard barrier curb and gutter and 2% crossfall has a conveyance capacity of approximately $3.827 \text{ m}^3/\text{s}$ at a longitudinal grade of 0.6%. Therefore, the proposed right-of-way has sufficient capacity to convey major flows to the proposed stormwater management facility. The major flow conveyance modelling has been included in Appendix C.

6. Infiltration Assessment

As described in the Preliminary Hydrogeological Investigation (Chung and Vander Doelen Engineering, dated January 31, 2025), the existing conditions recharge rate for the area of proposed development is approximately 57,862 m³/yr (see Table No. 21). An enhanced infiltration system is proposed on site to mitigate the difference between existing and post-development condition infiltration volumes. The enhanced infiltration system will consist of rear lot infiltration galleries designed to infiltrate the 25mm storm event from the proposed building rooftops. The enhanced infiltration calculations in Table Nos. 21 to 27 assume that only the back half of the roof area from a townhome unit can be captured and infiltrated while for a single detached lot, the entire roof area is captured and infiltrated. For the medium density blocks, it has been assumed that 25% of the block area is available for infiltration. Therefore the analysis calculates the roof area and the size of each infiltration gallery based on the different lot widths proposed for the subdivision. With the enhanced infiltration system, the proposed development will meet 103% of the recharge rate from existing conditions.

Infiltration gallery drawdown time has been calculated based on an average infiltration rate of 15 mm/hr as noted in the Geotechnical Investigation prepared by Chung and Vander Doelen Engineering (dated February 6, 2025). The average drawdown time of the infiltration galleries is estimated at 22 hours. The contributing runoff was then compared to the number of times the infiltration galleries could be filled with runoff (i.e. runoff available and available capacity to infiltrate) and a safety factor of 0.85 was applied to the resulting runoff depth each month.

As part of the detail design stage, once Draft Plan approval has been granted, we will conduct the required Guelph Permeameter Testing to confirm the in-situ infiltration rates as required by the Stormwater Management Planning and Design Guide.

7. Sediment and Erosion Control Plan

Primary sediment control will be achieved with the installation of heavy duty sediment fencing around the property boundary. The silt fence will eliminate the opportunity for water borne sediments to be transported from the site.

Temporary rock check dams will be installed in rear and side yard swales after the initial grading has been completed to slow the flow rates and promote the settlement of waterborne sediments before they reach the silt fences and the stormwater management facility.

Upon completion of the grading, any area not subject to active construction within 30 days will be topsoiled and seeded as per OPSS 572.

The stormwater management facility will be graded and shaped at the start of any construction or pre-grading activity and act as a sediment pond. Per the Erosion and Sediment Control Guide for Urban Construction (CVC), a sediment pond should be designed with $125 \text{ m}^3/\text{ha}$ of permanent pool volume. For the maximum contributing area of 35.97 ha (given grading constraints), the required permanent pool volume is $4,496 \text{ m}^3$. The stormwater management facility will provide $4,080 \text{ m}^3$ of permanent pool. A silt fence will be placed around the outlet structures to restrict the movement of sediment.

Once catch basins have been installed, the grates will be wrapped in filter cloth. This will be maintained until all building and landscaping has been completed.

Inspection and maintenance of all silt fencing and the sediment pond will start after installation is complete. These features will be inspected on a weekly basis or after a rainfall event of 13 mm or greater. Maintenance will be carried out, within 48 hours, on any part of the facility found to need repair.

Once construction has been substantially completed, the silt fence will be removed from within the pond, any accumulated sediment will be removed and the landscaping and planting of the stormwater management facility will be completed.

After construction of the complete development, erosion will not occur and sediment transport will be minimal. The stormwater management facility will provide all sediment removal.

8. Maintenance Plan

To ensure that the stormwater management system continues to function as designed and constructed, we recommend that the following inspections and maintenance activities be completed on an annual basis:

1. Is there any indication of a spill (i.e. frothy water, oily sheen on the water)? If yes, investigate, inform the appropriate agencies and complete the necessary clean-up and restoration.
2. Inspect the orifice plates. Remove and dispose of any accumulated sediment, trash/litter, debris (i.e. sediment, garbage, leaves, etc.).
3. Inspect all catch basins and manholes. Remove and dispose of any accumulated sediment, trash/litter, debris (i.e. sediment, garbage, leaves, etc.).
4. Inspect all swales and overflow locations. Remove and dispose of any accumulated sediment, trash/litter, debris (i.e. sediment, garbage, leaves, etc.).

Please note that any structures identified during the annual inspection to be worn, missing or damaged are to be repaired or replaced within 48 hours.

9. Conclusions

In summary, the features of the design for the proposed development are as follows:

- 1) Sanitary service for the site will be provided by extending a sanitary sewer west along St. David Street N (Highway No. 6) to the site entrance. Internal sanitary sewers will then be extended throughout the site via the municipal rights-of-way to provide sanitary servicing for the proposed development.
- 2) Water servicing for the site will be provided by extending a watermain west along St. David Street N (Highway No. 6) to the site entrance. An internal watermain will then be extended throughout the site via the municipal rights-of-way to provide water service for the proposed development. Watermain sizing is to be confirmed at the detail design stage.
- 3) Storm sewers will be sized at the detailed design stage to convey the 5-year design storm event to the proposed stormwater management facility. Major overland flows will be directed towards the municipal rights-of-way to the proposed stormwater management facility.
- 4) The proposed stormwater management facility is designed to function as a wetland with 0.3 m deep permanent pool and forebay to provide an Enhanced level of quality control (80% Total Suspended Solid removal).
- 5) The post-development flow rates discharging from the site during the 2 to 100-year design storm events are less than the existing conditions flow rates from the site. The Regional Storm is conveyed overland through the site.
- 6) Infiltration galleries sized to infiltrate the 25 mm design storm event from building rooftops will be implemented in rear yard areas of the proposed lots to meet the infiltration requirements for the site.
- 7) The stormwater management systems meet the current Provincial and Municipal guidelines.
- 8) The principles of “Stormwater Management Practices”, the Ministry of Environment Stormwater Management Planning and Design Manual 2003 have been used in the design of the stormwater management system.

Appendix A Geotechnical Investigation (Chung and Vander Doelen Engineering Ltd., dated February 6, 2025) and Preliminary Hydrogeological Investigation (Chung and Vander Doelen Engineering Ltd., dated January 31, 2025)



CHUNG & VANDER DOELEN
ENGINEERING LTD.

GEOTECHNICAL INVESTIGATION
PROPOSED POLOCORP FERGUS SUBDIVISION – PHASE 1
968 St. David Street North
Fergus, Ontario

SUBMITTED TO:

PoloCorp Inc.
379 Queen Street South
Kitchener, Ontario
N2G 1W6

ATTENTION:

Mr. Mike Puopolo



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1
519-742-8979

February 6, 2025
File No.: 1495

PoloCorp Inc.
379 Queen Street South
Kitchener, Ontario
N2G 1W6

Attention: Mr. Mike Puopolo

RE: Geotechnical Investigation
Proposed Polocorp Fergus Subdivision – Phase 1
968 St. David Street North, Fergus, Ontario

We take pleasure in enclosing one (1) copy of our Geotechnical Investigation Report prepared for the above-referenced site.

If you have any questions or clarifications are required, please contact the undersigned at your convenience.

We thank you for giving us this opportunity to be of service to you.

Yours truly,
CHUNG & VANDER DOELEN ENGINEERING LTD.

Eric Y. Chung, M.Eng., P.Eng.
Principal Engineer

TABLE OF CONTENTS

	Page
Letter of Transmittal	i
Table of Contents	ii
List of Appendices and Enclosures	ii
1.0 INTRODUCTION	1
2.0 FIELD AND LABORATORY WORK	2
3.0 EXISTING SITE CONDITIONS	3
4.0 SUBSURFACE CONDITIONS	3
4.1 Topsoil and Peat.....	3
4.2 Fine Granular Deposits.....	3
4.3 Clayey Silt Till and Sand and Silt Till	4
4.4 Groundwater.....	4
5.0 DISCUSSION AND RECOMMENDATIONS.....	6
5.1 Site Grading and Engineered Fill Construction	7
5.2 Site Servicing.....	10
5.2.1 Groundwater Control and Open Cut Excavation	10
5.2.2 Pipe Bedding	11
5.2.3 Trench Backfill.....	11
5.3 Footing Foundations	12
5.4 Lateral Earth Pressure.....	14
5.5 Earthquake Considerations.....	15
5.6 Pavement Design	15
5.7 Infiltration Rates of On-Site Soils.....	16
5.8 Handling of Excess Soils	17
6.0 CLOSURE.....	18

LIST OF APPENDICES AND ENCLOSURES

Appendix A	Limitations of Report
Appendix B	Draft Plan of Subdivision (Polocorp, December 10, 2024) Drawing No. 1 – CVD Borehole Location Plan
Appendix C	Single Well Response Test Analysis Charts
Appendix D	Table 1 – Summary of Groundwater Levels and Elevations Figure 5 – Water Table Contours Interpretation (September 18, 2024)
Enclosure A	Soil Abbreviation and Terms Used on Record of Borehole Log Sheets
Enclosures 4 to 8 & 14 to 21	Borehole Log Sheets
Enclosures 24 to 28	Grain Size Distribution Charts



1.0 INTRODUCTION

CHUNG & VANDER DOELEN ENGINEERING LTD. has been retained by PoloCorp Inc. to conduct a geotechnical investigation for the proposed Phase 1 development of the Polocorp Fergus Subdivision to be located at 968 St. David Street North in Fergus, Ontario. It is planned that the development will eventually expand to potentially include the fields directly north of the site as part of the Phase 2 development; however, this report will only consider the portion of the geotechnical investigation completed on the Phase 1 lands.

It is understood that the 19.39± ha site currently being used for agricultural purposes will be developed into a residential subdivision comprised of a combination of residential single units, stacked townhouses, mixed-use units, roadways, a stormwater management facility, and a park. The proposed residential subdivision will be fully serviced with municipal water and sanitary sewer services.

According to the Draft Plan of Subdivision (Polocorp Inc., December 10, 2024), as provided in Appendix B, Phase 1 of the Polocorp Fergus Subdivision will include the construction of a 2.41± ha sized stormwater management (SWM) facility, designated as Block 23, within the southwest corner of the property and a roadway network throughout the subdivision connected to St. David Street North. Other characteristics of the future development are to include a 0.81± ha sized park (Block 25) and a 3.34± ha sized environmental feature and buffer. The existing residential dwelling located at 968 St. David Street North will be incorporated into the proposed residential subdivision (Block 22).

As of the writing of this report, no site grading plan has been provided. CVD will be pleased to review the final design and site grading plan once they are made available.

The purpose of this investigation was to determine the subsurface soil and groundwater conditions at the site and, based on the findings, to make geotechnical recommendations for:

- Site grading operations and engineered fill construction;
- Excavation conditions;
- Groundwater control during construction;
- Foundation bearing pressures;
- Foundation soil classification for seismic design per OBC 2024;
- Site servicing;
- Pavement design and construction; and
- Estimates of infiltration rates of encountered soil deposits.

This geotechnical report should be read in conjunction with CVD's Phase 1 Preliminary Hydrogeological Investigation Report (January 2025).



2.0 FIELD AND LABORATORY WORK

Five (5) boreholes were advanced to depths of between 5.20 and 8.25 m below existing grade, and monitoring wells were installed at each borehole location (labelled Boreholes 4 to 8), between January 15 to 17, 2024. A supplemental investigation was completed, between September 9 and 12, 2024, during which eight (8) additional boreholes/monitoring wells (labelled Boreholes 106 to 113) were drilled and installed to a depth of 6.55 m below grade. The borehole/monitoring well locations are illustrated on the Borehole Location Plan, Drawing No. 1, which is included in Appendix B.

The field investigation program was conducted under the supervision of a member of our engineering team, who logged the subsurface conditions encountered at the boreholes, effected the subsurface sampling and testing, and monitored the groundwater conditions. The boreholes were advanced using a track-mounted drilling rig, supplied, and operated by a specialized contractor. The drill rig was equipped with continuous flight augers and standard soil sampling equipment. Underground utilities were located prior to commencing the field work program.

The investigation was completed using a track-mounted CME-55 drill rig, equipped with standard 83 mm inner diameter hollow stem augers (HSA) operated by Davis Drilling Ltd. of Milton, Ontario. Standard penetration tests (SPTs) in accordance with ASTM Specification D1586, were carried out at frequent intervals of depth, and the results are shown on the Borehole Logs as Penetration Resistance or “N”-values. The undrained shear strength of the cohesive soil deposits was determined on the slightly disturbed SPT samples using a field pocket penetrometer. The compactness condition or consistency of the soil strata has been inferred from the test results.

Soil samples collected during the borehole investigation program were examined in the field and subsequently brought to CVD’s laboratory for tactile examination to confirm field classification. Moisture content determination on all retrieved soil samples was performed.

The borehole location, temporary benchmark, and associated ground surface elevations were surveyed by CVD for the purpose of this report using a Network RTK Global Navigation Satellite System (GNSS) Receiver. The survey data was collected using The UTM Zone 17N Projection, NAD83(CSRS)v7-2010 datum and Canada Geoid Model HT2_2010v70 (CGVD28).

The referenced temporary benchmark (TBM) is described below:

TBM:	Top of fire hydrant nut, south of northern driveway entrance to 968 St. David Street North, as shown on Drawing No. 1
Elevation:	425.17 m (Geodetic)



3.0 EXISTING SITE CONDITIONS

The property is bound by St. David Street North to the west and predominantly by agricultural lands to the north, east, and south of the subject lands. Occasional commercial properties exist southwest of the site.

The majority of the site is comprised of a cultivated agricultural field. A residential dwelling and its related structures front St. David Street North at the west side of the proposed development, and a small wetland contained mid to large sized trees exists in the southeast corner of the site. An existing residential subdivision is situated directly southeast of the southeastern corner of the site.

Generally, there is gentle decrease in grade across the site in a southeasterly direction in which ground elevations range from $427\pm$ to $420\pm$ m. No major undulations or notable topographical features exist. Ground surface elevations at the borehole locations ranged between 421.01 m to 426.95 m.

4.0 SUBSURFACE CONDITIONS

The detailed subsurface conditions encountered at the thirteen (13) boreholes are presented on the Borehole Log Sheets, Enclosures 4 to 8 & 14 to 21. The following notes are intended to amplify and comment on the subsurface data obtained. The borehole and monitoring well locations are indicated on the Borehole Location Plan, Drawing No. 1, included in Appendix B.

Enclosure A provides explanations of the various soil abbreviations and terms used on the borehole log sheets. The stratigraphic boundaries shown on the borehole logs are inferred from non-continuous sampling conducted during advancement of the borehole drilling procedures and, therefore, represent transitions between soil types rather than exact planes of geologic change. The subsurface conditions will vary between and beyond the borehole locations.

4.1 Topsoil and Peat

Topsoil was encountered at the ground surface of twelve (12) boreholes with measured thicknesses between 180 and 300 mm. The thickness of topsoil could vary between and beyond the borehole locations.

An $800\pm$ mm thick peat deposit was encountered at the ground surface of Borehole 107.

4.2 Fine Granular Deposits

The topsoil was typically underlain by a series of fine granular deposits varying between silt, sandy silt, silty sand, and fine to medium sand, but predominantly composed of fine to medium sand. These deposits generally decrease in thickness from north to south across the property with the deposits extending to depths between at least $8.25\pm$ m (below elevation 417.36 m at Borehole 5) below ground surface (mbgs) to 0.75 mbgs (elevation 421.27 m at Borehole 113). Trace amounts of gravel, occasional



gravelly seams (Boreholes 106 and 109), occasional cobbles, and occasional clayey silt seams/layers (Boreholes 4 and 111) were encountered within the deposit. Boreholes 4, 5, 106, and 108 were terminated within the fine granular deposits.

The results of five (5) grain size distribution analyses from the fine to medium sand in Boreholes 106, 108, and 111 (Enclosures 24, 25, and 27), the sand and silt in Borehole 109 (Enclosure 26), and the silt from Borehole 28 (Enclosure 28) are shown graphically on Enclosures 24 to 28.

The SPT “N”-values measured within the fine granular deposits ranged from 3 to 35 blows per 300 mm of penetration, indicating a variable very loose to dense relative density. Natural moisture contents were measured between 2 and 27%, indicating damp to saturated moisture conditions.

4.3 Clayey Silt Till and Sand and Silt Till

The aforementioned fine granular deposits were underlain by a till deposit varying from a clayey sandy silt till (Boreholes 6 to 8, 107, 109, and 111 to 113) to a sand and silt till (Borehole 110, 112, and 113). Trace to some gravel and occasional silt lenses/seams were encountered within the deposit. Boreholes 6 to 8 were terminated within the till deposit at a depth of 5.20 mbgs, and Boreholes 107 and 109 to 113 were terminated within the till deposit at a depth of 6.55 mbgs.

The SPT “N”-values measured within the till deposit ranged from 8 to 69 blows per 300 mm of penetration with the sand and silt till generally having a relative density varying from compact to very dense.

The undrained shear strength obtained on the retrieved cohesive clayey silt till samples was measured from 25 to greater than 250 kPa. Based on the above test results and the tactile examination, the clayey silt till is considered to have a stiff to hard consistency. Natural moisture contents were measured between 7 and 25%, and the plasticity of the clayey silt till layers was generally observed to be drier than the plastic limit.

4.4 Groundwater

Throughout the field investigation, groundwater conditions were monitored during advancement of boreholes, and water level readings were measured on multiple occasions following the completion of fieldwork in all of the accessible thirteen (13) installed monitoring wells

Groundwater levels were measured at depths ranging between 2.27 (Borehole 5) and 0.25 mbgs (Borehole 8), corresponding to elevations ranging between 423.62 and 420.28 m. The groundwater measurements for each monitoring well collected thus far for the investigation (February to October 2024) are summarized in Table 1 (Appendix D). It is noted that the observed groundwater table will fluctuate seasonally, such as during the spring following the period of peak snow melt, and in response to major weather events. It is possible that peak water levels could be up to 0.5 m higher than those measured in this investigation.



Figure 5, also included in Appendix D, presents an interpretation of the water table configuration and shallow groundwater flow directions across the property using the groundwater elevation measurements gathered on September 18, 2024. The water table mimics the topography of the site with shallow groundwater flowing southerly towards the southeastern portion of the property in the direction of the wetland. Additionally, groundwater appears to also flow into the existing drainage feature located within the southwestern corner of the site.

Well response tests (slug/bail tests) were completed at three (3) of the monitoring well locations (Boreholes 5 to 7) on March 11, 2024, to provide a more accurate estimate of the hydraulic conductivity (K) (or permeability) of the saturated aquifer soil strata. These tests resulted in hydraulic conductivity values ranging from 3×10^{-5} to 9×10^{-5} m/s. These results are graphically presented in Appendix C, and a summary of the data is also included in Table 1 (Appendix D).

These values are consistent with the hydraulic conductivity ranges typically associated with similar soils (Freeze & Cherry, 1979). Hydraulic conductivities calculated using the Hazen Formula from the soil grain size analyses (Enclosures 24 to 28) were similar in magnitude to those of the single well response tests.



5.0 DISCUSSION AND RECOMMENDATIONS

It is understood that the 19.39± ha site currently being used for agricultural purposes will be developed into a residential subdivision comprised of a combination of residential single units, stacked townhouses, mixed-use units, roadways, a stormwater management facility, and a park. The proposed residential subdivision will be fully serviced with municipal water and sanitary sewer services.

According to the Draft Plan of Subdivision (Polocorp Inc., December 10, 2024), as provided in Appendix B, Phase 1 of the Polocorp Fergus Subdivision will include the construction of a 2.41± ha sized stormwater management (SWM) facility, designated as Block 23, within the southwest corner of the property and a roadway network throughout the subdivision connected to St. David Street North. Other characteristics of the future development are to include a 0.81± ha sized park (Block 25) and a 3.34± ha sized environmental feature and buffer. The existing residential dwelling located at 968 St. David Street North will be incorporated into the proposed residential subdivision (Block 22).

In general, the surficial topsoil was underlain by a series of loose to compact fine granular deposits, predominantly comprised of fine to medium sand. These deposits generally decrease in thickness from north to south across the property with the deposits extending to depths between at least 8.25± mbgs (below elevation 417.36 m at Borehole 5) to 0.75 mbgs (elevation 421.27 m at Borehole 113). These fine granular deposits were underlain by stiff to hard clayey silt till and/or compact to dense sand and silt till deposits. Occasional cobbles were encountered within the deposits. Peat deposits can be found in an around the existing wetland.

More extensive loose soil conditions were occasionally encountered in the near surface soils of some of the boreholes (e.g. Boreholes 4 and 5) which are not suitable to support future house foundations in their current condition. Removal of such loose zones and replacement with engineered fill (where necessary) is considered to be a suitable and practical remedy to repair such areas.

Shallow groundwater conditions were encountered at all thirteen (13) borehole locations with the water table measured across all site visits at depths between 2.27 (Borehole 5) and 0.25 mbgs (Borehole 8), corresponding to elevations ranging between 423.62 and 420.28 m. Shallow groundwater flows southerly towards the southeastern portion of the property in the direction of the wetland. Additionally, groundwater appears to also flow into the existing drainage feature located within the southwestern corner of the site. Based on both the single well response tests and grain size analyses, the hydraulic conductivity values for the fine to medium sand deposit were calculated between 3×10^{-5} and 9×10^{-5} m/s.

It is recommended that a permanent groundwater management system (GWMS) be implemented for the development of the subdivision lands to control future groundwater levels and prevent future wet basement problems. Alternatively, the site can be raised to establish basement floor levels at least 0.6 m above high groundwater levels which will be determined through on-going monitoring as part of the CVD hydrogeological study.

Furthermore, it is recommended that any existing below-grade drains, drainage tiles or drainage tile networks be fully understood/investigated to understand how their presence (or removal) would impact the shallow groundwater system and the proposed development.



As of the writing of this report, no site grading plan has been provided. CVD will be pleased to review the final design and site grading plan once they are made available.

5.1 Site Grading and Engineered Fill Construction

As of the writing of this report, no site grading plans have been provided; however, it is anticipated that partial regrading of the site will be conducted using “cut-fill” procedures, and that more extensive “fill” operations will occur. It is recommended to construct engineered fill in areas to be raised in order to suitably support the proposed residential building structures, future roadways, and infrastructure servicing.

Inorganic on-site native soil deposits from “cut” areas may potentially be reused to construct engineered fill capable of supporting future house foundations, roadways, and municipal infrastructure servicing. The natural moisture content of the “cut” soils to be used as engineered fill should be within 3% below their optimum moisture contents in order to achieve the specified degree of compaction.

Topsoil was encountered at the ground surface of twelve (12) of the borehole locations with measured thicknesses ranging between 180± and 300± mm. Additionally, an 800± mm peat deposit was encountered at the ground surface of Borehole 107. It should be noted that the thickness of the organic soil layer could vary drastically across the site from those reported at the borehole locations. It is likely that the site has been regraded to achieve the present condition for farming, and therefore, filling of local depressions may result in fill pockets not detected by the boreholes.

Topsoil stripping operations should be conducted when the ground is not wet and will support large scale construction equipment. Over-stripping can result when the ground conditions are wet and unstable.

Fill and/or loose soil conditions were encountered at all borehole locations and extended up to depths of up to 3.0± m below existing grade. The following table provides the depth and elevation at each borehole location where non-suitable soil conditions were encountered:

Borehole No.	Topsoil Thickness (mm)	Existing Ground Elevation (m)	Thickness of Non-Suitable Soils (m)	Elevation of Suitable Soils (m)
4	300	426.9±	0.8±	426.1±
5	180	425.6±	3.0±	422.6±
6	250	424.5±	1.0±	423.5±
7	230	421.8±	1.0±	420.8±
8	300	421.0±	0.5±	420.5±
106	200	424.8±	0.5±	424.3±



Borehole No.	Topsoil Thickness (mm)	Existing Ground Elevation (m)	Thickness of Non-Suitable Soils (m)	Elevation of Suitable Soils (m)
107	800 - Peat	422.9±	1.0±	421.9±
108	250	424.7±	0.8±	423.9±
109	200	422.7±	0.6±	422.1±
110	300	422.9±	0.8±	422.1±
111	300	421.2±	0.4±	420.8±
112	200	422.3±	0.4±	421.9±
113	250	422.0±	0.9±	421.1±

It should be noted that the elevations of suitable soils shown in the above table may differ from the founding elevations provided for specific bearing capacities in section 5.3. The elevations provided in the above table are located below loose and/or organic/deleterious soils but may not necessarily be located at an elevation sufficient for higher bearing capacities

Approved on-site sand and imported coarse sand and gravel are recommended to be used to construct the engineered fill beneath the footings and floor slabs under controlled and supervised conditions. Reuse of siltier soils (e.g., sandy silt or silt) and cohesive soils should be limited to beneath pavement and landscaped areas.

Any shortfall of fill material required for engineered fill operations may be made with similarly graded imported soils. It is recommended that any proposed borrow source materials be tested prior to importing in order to ensure that the environmental quality of the imported fill meets all environmental approval criteria and to ensure that the natural moisture content of the fill is suitable for compaction. Should similarly graded soils not be able to meet the requirements for use as engineered fill, imported Granular B may be considered for such purposes.

Due to the shallow depth of the water table across the site (0.2± to 2.0± mbgs during the spring), it is recommended that engineered fill construction be conducted during the summer and early fall months when drier warmer weather conditions typically exist as the onsite soils are sensitive to moisture and will become difficult to handle and compact to the specified degree of compaction when wet.

The on-site finer grained and cohesive deposits are considered to be frost-susceptible. Constructing engineered fill, backfilling footings, foundation walls and service trenches using finer-grained soils during the winter months is not advisable, unless suitable weather conditions prevail, the soils are at suitable moisture content, and strict procedures are followed and monitored on a full-time basis by the geotechnical engineer.

The on-site soils are generally susceptible to softening and deformation when exposed to excessive moisture and construction traffic. As a result, it is imperative that the grading/filling operations are



planned and maintained to direct surface water run-off to low points and then be positively drained by suitable means. During periods of wet weather, construction traffic should be directed along the designated construction routes so as not to disturb and rut the exposed subgrade soil. Temporary construction roads consisting of clear crushed material (such as crushed stone or recycled concrete) may be required during poor weather conditions such as wet spring or fall.

The following procedures are recommended for the construction of engineered fill to support future building foundations, roadways, and municipal infrastructure servicing:

1. All topsoil, peat, fill materials, deleterious materials and very loose to loose inorganic native soil should be stripped from building envelope and roadway areas. The inorganic native soil may be carefully segregated and salvaged for potential reuse purposes to construct engineered fill;
2. The exposed subgrade surface should be thoroughly recompactd using large heavy compaction equipment (smooth drum for granular based materials and sheepsfoot for cohesive soils) if it can support such equipment and remaining stable. Careful review and guidance by the geotechnical engineer are recommended should the subgrade become unstable. All prepared subgrade areas are to be inspected by qualified geotechnical personnel prior to placement of fill. Any soft spots encountered during the recompaction process should be excavated to the level of competent soil;
3. The required grades can then be achieved by placing approved inorganic on-site soil or imported fill in maximum 200 to 300 mm thick loose lifts which are to be thoroughly compacted to at least 100% Standard Proctor maximum dry density (SPMDD). The moisture content of the fill materials should be within 3% below their optimum moisture contents in order to achieve the specified degree of compaction;
4. The engineered fill used to support the future building, infrastructure servicing and roadway pavements must be placed such that the fill pad extends horizontally outwards at least a distance equal to the depth of fill to be placed;
5. Inorganic onsite soils may be considered as suitable engineered fill material provided the natural moisture content of the soil is within 3% below the optimum moisture content in order to achieve the specified degree of compaction. Overly wet and organic materials may be placed in non-structural areas and beyond stormwater management areas where 90% SPMDD is considered adequate. Overly wet inorganic soil may potentially be mixed with drier soils to produce a suitable moisture content to allow appropriate compaction to occur;
6. Adequate earth cover must be provided to protect engineered fill from freezing if left over the winter months; and
7. All fill placement and compaction operations must be supervised on a full-time basis by qualified geotechnical personnel to approve fill material and ensure the specified degrees of compaction have been achieved.

Vibration could be generated from various construction equipment during construction, such as compactors and rollers which could be harmful to surrounding structures and buildings. Peak particle



velocity (PPV) of ground motion is widely accepted as the best descriptor of potential for vibration damage to structures. The safe vibration limit can be set to 8 to 25 mm/s PPV, depending on frequency of vibrations and the sensitivity of surrounding structures to vibration.

Due to the relatively isolated location of the site, it is unlikely that any critical or susceptible infrastructure will be affected by the site grading operations. However, if deemed necessary, vibration monitoring can be performed. Vibration monitoring can be carried out to measure the PPV of ground motion from vibration generated from typical compaction equipment at the beginning of the project in potentially critical areas. This will set criteria and establish the type of equipment to be used for this project. It is also recommended that a pre-construction condition survey be conducted to document the condition of the existing structures within the possible zone of influence.

5.2 Site Servicing

The subdivision will be municipally serviced with watermain and sewers. According to the Centre Wellington Development Manual (June 2024), it is anticipated that municipal servicing will generally lie $1.2\pm$ to $2.4\pm$ m below finished grades. The sanitary sewer obvert should be located a minimum of 2.4 m below final road grade, the storm sewer obvert should be located 1.2 m below final road grade and adequately compacted, and the top of the watermain pipe should be located 2.0 m below finished grade.

5.2.1 Groundwater Control and Open Cut Excavation

Excavations are expected to be in the order of $1\pm$ to $3.5\pm$ m deep for foundations and site servicing. The excavations will penetrate topsoil, potentially peat/organics, native loose to compact fine granular deposits, and native stiff to hard clayey silt till and/or compact to very dense sand and silt till. Provided the groundwater is controlled/lowered below the excavation depths, these materials are considered to be Type 3 Soils in accordance with the latest Occupational Health and Safety Act.

Above the groundwater table, uncontrollable groundwater is not expected within the anticipated depths of excavation, and excavations in the Type 3 Soils are expected to remain stable during the construction period provided that side slopes are cut to 1H : 1V from the bottom of the excavation. Where seepage or perched groundwater is encountered, side slopes should be cut to more stable angles of 3H : 1V. The side slopes should be suitably protected from erosion processes. Surface run-off which inadvertently enters the excavation can be controlled by using conventional filtered sump pumping techniques, as and where required.

Even though a site grading plan has not yet been provided, it is expected that groundwater control will be required for at least some of the footing excavations since excavations will be carried out below the groundwater table within the higher conductive fine granular soils (hydraulic conductivity ranging from 3×10^{-5} to 9×10^{-5} m/s), and the fine granular soils will become “quick” and lose their integrity to support loads. The groundwater level must be lowered and controlled to at least 600 mm below the excavation level to facilitate excavation and construction of footings and floor slabs.



Depending on whether the excavation is conducted in an area where the water table is located below the fine granular deposits within the clayey silt till or sand and silt till, it may be possible to control by pumping from filtered sump pits (possibly together with drainage ditches and intercept ditches). It is recommended that CVD be retained to review the design grades and evaluate the need for dewatering. Depending on the depth of sewer and footing excavation below the groundwater table, well-point dewatering could be required to pre-drain the fine granular soil prior to excavation.

In wet to saturated subgrade conditions, it will be necessary to excavate below founding level and pour a 50 to 75 mm thick mud slab of lean concrete to protect the founding soil from disturbance during the installation of reinforcing steel bars and form work.

5.2.2 Pipe Bedding

Any loose, unstable and/or organic soils encountered at the pipe invert should be sub-excavated and replaced with well compacted Granular "A" which should be placed in 150 mm thick layers and compacted to at least 95% Standard Proctor Maximum Dry Density (SPMDD). The support of pipes in these areas can also be achieved with non-shrinkable fill if poor soil is encountered at the subgrade level and fully removed.

The bedding requirements for the services should be in accordance with both the Ontario Provincial Standard Drawings OPSD - 802 for flexible and rigid pipes. The bedding shall be a Class "B" and consist of at least 150 mm thick Granular "A" compacted to at least 95% SPMDD. Granular "A" should be used to backfill around the pipe to at least 150 mm above the top of the pipe.

Particular attention should be given to ensure material placed beneath the haunches of the pipe is adequately compacted. Recycled asphalt will not be allowed to be used in Granular "A" bedding material.

5.2.3 Trench Backfill

Excavated inorganic materials are considered suitable for reuse as trench backfill. If necessary, potential mixing of drier and wetter excavated soils in proper ratios can be done to produce a suitable mixture near the material's optimum moisture content in order to achieve the required compaction specification. Conversely, judicious addition of water may be required if the soils are significantly drier than their optimum moisture content in order to facilitate suitable compaction.

The backfill should be placed in thin layers, 200 to 300 mm thick or less dependant on the demonstrated success of compaction based on in-situ density test results. Other types of materials such as organic soils, overly wet soils, boulders, and frozen materials (if work is carried out in the winter months) should not be used for backfilling. All backfill should be compacted to at least 95% SPMDD.

Backfilling operations should follow closely after excavation so that only a minimal length of trench slope is exposed at any one time so as to minimize potential problems. This will potentially minimize over-wetting of the subgrade material. Particular attention should be given to make sure frozen



material is not used as backfill should construction extend into the winter season.

Regarding the clayey silt till deposits, it has been our experience that excavated cohesive soils should be broken into smaller pieces (less than 150 mm diameter) before returning into the trench as backfill. This will eliminate “wedging” problems and reduce long term settlement. Particular attention must be made to backfilling the laterals where the trenches are narrow and against the manholes and catch-basins. Thinner lifts and additional compaction must be applied.

Frequent inspection by experienced geotechnical personnel should be carried out to examine and approve backfill material, to carefully inspect placement, and to verify that the specified degree of compaction has been obtained by in situ density testing.

5.3 Footing Foundations

Conventional strip and spread footing foundations can be used to support the proposed buildings of the proposed residential subdivision; it should be noted that this current geotechnical investigation is insufficient and not intended for detailed building design purposes.

Depending on the final design and size of the proposed medium density blocks (Block 19 and 20) and other larger structures, it will be necessary to conduct a geotechnical investigation at those lots in order to provide a detailed, site and project specific report for the design and construction of the proposed development.

Based on the thirteen (13) widely spaced boreholes, footings cast on native competent stiff to hard clayey silt till, compact to dense sand and silt till, or compact fine granular deposits can be designed using net Geotechnical Reactions at SLS and Factored Geotechnical Resistances at ULS as provided in the following table which summarizes the highest founding level and elevation for the footing at the relevant borehole locations:

Borehole No.	Existing Ground Elevation (m)	Highest Founding Depth (m)	Highest Founding Elevation (m)
SLS = 100 kPa; ULS = 150 kPa			
4	426.94	0.94	426.00±
5	425.61	3.01	422.60±
107	422.93	1.03	421.90±
109	422.66	0.86	421.80±
SLS = 150 kPa; ULS = 250 kPa			
6	424.53	1.03	423.50±
7	421.82	1.02	420.80±



Borehole No.	Existing Ground Elevation (m)	Highest Founding Depth (m)	Highest Founding Elevation (m)
8	421.01	1.11	419.90±
106	424.80	0.90	423.90±
108	424.74	0.84	423.90±
110	422.92	0.82	422.10±
111	421.24	0.64	420.60±
112	422.30	0.50	421.80±
113	422.02	0.92	421.10±

Higher soil bearing capacities may be available for footings founded at elevations lower than those cited above, through a site and project specific geotechnical evaluation.

Footings founded on approved engineered fill can be designed to a net Geotechnical Reaction of 150 kPa at SLS and Factored Geotechnical Resistance of 250 kPa at ULS.

These soil bearing pressures can be achieved provided that the founding subgrade is undisturbed during construction. The majority of the settlements will take place during construction and the first loading cycle of the building. In addition, the footings should be founded below any topsoil, fill, or other deleterious materials on competent undisturbed soils. Spacing between adjacent footing steps should not be steeper than 10H to 7V.

It should be noted that due to the relatively high groundwater table (elevations 420.20± to 423.60± m), unless engineered fill (see Section 5.1) is used to raise the grade, the majority of the footing excavations are anticipated to contact wet to saturated fine granular soils. To this end, it is recommended that a 50 to 75 mm thick protective concrete slab should be poured and allowed to set on the prepared subgrade to further protect it from disturbance by construction traffic and the elements. Basements should be suitably founded at least 0.6 m above the high groundwater table. A permanent groundwater management system (GWMS) could be utilized to control future groundwater levels and prevent future wet basement problems.

Exterior footings and footings in unheated portions of the building should be provided with a soil cover of not less than 1.2 m or equivalent synthetic thermal insulation for adequate frost protection. The founding subgrade soils must be protected from frost penetration during winter construction.

The footing excavations should be inspected by the geotechnical engineer to ensure adequate soil bearing and proper subgrade preparation.



5.4 Lateral Earth Pressure

House basement walls and other soil retaining structures should be designed to resist the lateral earth pressure acting against these walls. The following formula may be used for these calculations. The following formula may be used to calculate the unfactored earth pressure distribution. The factored resistance can be calculated by using a factor of 0.8.

$$P = K (\gamma H + q)$$

where:

P =	Lateral earth pressure	kPa
K =	earth pressure coefficient, 0.5 for non-yielding foundation wall earth pressure coefficient, 0.3 for yielding retaining wall	
γ =	unit weight of granular backfill, compacted to 95% SPMDD	21 kN/m ³
H =	unbalanced height of wall	m
q =	surcharge load at ground surface	kPa

The backfill for the foundation walls and retaining walls should be free-draining granular materials which should have less than 8% silt particles (OPSS Granular “B” Type I). The backfill should be placed in thin layers and compacted to 95% SPMDD. Over-compaction adjacent to the foundation/retaining walls should be avoided. Compaction should be carried out with hand operated equipment within 1 m of the foundation wall or retaining wall. Weeping tiles leading to a frost-free outlet or weep holes should be installed to effect drainage behind the retaining wall.

The sliding resistance of the retaining wall footings should be checked. The unfactored horizontal resistance against sliding between cast-in-place concrete and the various soils can be calculated using the following unit weight and friction coefficient:

Soil	Unit Weight (kN/m ³)	Friction Coefficient
Well-Compacted Granular Backfill	21	0.45
Fine to Medium Sand	20	0.35
Silt	19	0.30
Clayey Silt Till and Sand and Silt Till	20	0.40

It should be noted that the soils encountered during the investigation were variable in composition and are not all are considered to be free-draining materials (i.e., clayey silt till). A drainage core layer should be installed against basement walls in accordance with OBC requirements. The basement walls should be damp-proofed.



A perimeter drainage system is required to ensure hydrostatic pressure does not build up in the backfill against the foundation wall. The perimeter weeping tile system is to be installed at the base of the footing to direct the collected waters to sump pump installations or the storm sewer.

5.5 Earthquake Considerations

In accordance with The Ontario Building Code 2024 (OBC), the proposed structure should be designed to resist earthquake load and effects as per OBC Subsection 4.1.8.

Based on the condition of the underlying soil encountered at the boreholes, and the fact that any loose/soft soils will be removed, and our experience with the local soil conditions up to a depth of 30 m, the site can be overall be classified as **Site Class D** as per OBC Table 4.1.8.4B.

5.6 Pavement Design

The earth subgrade soil is generally expected to consist of fine granular deposits (sand, silt) and cohesive clayey silt till soils. Cognizant of the traffic volume and the subgrade soils, the following pavement component thicknesses (per Centre Wellington Development Manual, June 2024) are considered suitable for industrial roads:

Pavement Component	Local Road Component Thickness (mm)	Collector Road Component Thickness (mm)
HL3 Surface Asphaltic Concrete	40	50
HL4 Binder Asphaltic Concrete	50	60
Granular “A” Base Course	150	150
Granular “B” Type II Sub-base Course	450	600
Granular Base Equivalency (GBE)	630	770

Note: GBE denotes Granular Base Equivalency which is calculated using factors of 2 for asphaltic concrete, 1 for Granular “A” base and 0.67 for Granular “B” sub-base

The pavement design considers that road construction will be carried out during the drier time of the year and that the subgrade is stable, not heaving under construction equipment traffic. If the subgrade is wet or unstable, additional granular sub-base may be required.

The subgrade should be prepared in accordance with the recommendations provided in Sections 5.1 and 5.2 prior to placement of the granular base layers.

The base and sub-base materials should be produced in accordance with the current OPSS specifications and placed and uniformly compacted to at least 100% SPMD. The asphaltic concrete should be placed and compacted in accordance with OPSS Form 310 and to a minimum of 92% of the Marshall Density



(MRD). Frequent in-situ density testing by this office should be carried out to verify that the specified degree of compaction is being achieved and maintained.

SS-1 or SS-1HH tack coat should be applied to all binder course surfaces and vertical surfaces (i.e., curbs, pavement joints, etc.) prior to placement of asphalt. Refer to OPSS 310 and OPSS 1101 for additional details.

It should be noted that even well compacted trench backfill could settle for a period of time after construction. In this regard, the surface course of the asphaltic concrete should be placed at least one (1) year after trench backfill is completed so as to allow any minor settlements to occur within the trench backfill. The incomplete pavement structure may not be capable of supporting construction traffic. Consequently, minor repairs of the sub-base, base and asphaltic concrete may be required prior to paving with the base course and/or the surface course asphaltic concrete.

Due to the relatively high low depth of the wet to saturated soil conditions found throughout the site ($0.2\pm$ to $2.3\pm$ mbgs), longitudinal sub-drains with positive drainage outlets are recommended to be installed at the subgrade level along the edges of the roadway construction to enhance the performance of the pavement.

Positive drainage outlets should be provided at all low points of the prepared earth subgrade, such as stub drains extended from the catch-basins. Systematic drainage of the granular base materials will promote the longevity of the pavement structure. The prepared earth subgrade and final pavement surfaces should be graded to direct water runoff away from buildings, sidewalks, and other similar pertinent structures. The roadway subgrade should be free of depressions and should have a 2% slope from the crown to the edge of the pavement.

5.7 Infiltration Rates of On-Site Soils

It is understood that a stormwater management (SWM) facility is planned to be constructed in the southwestern corner of the site (Block 23). If an infiltration feature is to be included in the development of the property, it should be located below the footing drain/weeper and at least 5 m away from the proposed building footprints. Additionally, the infiltration features should have the base located at least 1.0 m above the groundwater table, and a minimum infiltration rate of 15 mm/hr is required.

Based on the results of grain size analyses and our experience, the hydraulic conductivity and infiltration rate of the native inorganic soil types encountered at the boreholes are estimated and provided in the following table and may be used for storm water management purposes:



Material	Hydraulic Conductivity (K) (cm/sec)	Infiltration Rate (mm/hr)
Fine to Medium Sand (Enclosures 24, 25, and 27)	3×10^{-3} to 9×10^{-3}	75 to 150
Sandy Silt to Sand and Silt (Enclosure 26)	3×10^{-5} to 1×10^{-4}	10 to 20
Silt (Enclosure 28)	1×10^{-5}	3 to 5
Clayey Silt Till	1×10^{-6}	<1

Due to the predominantly clayey silt till soils (Boreholes 7, 112, and 113), and the high water table in the area (depths of $0.2\pm$ to $1.6\pm$ mbgs, corresponding to elevation between $420.8\pm$ and $421.6\pm$ m across all seasons), the SWM facility might need to be either raised sufficiently above the water table or redesigned to be feasible.

5.8 Handling of Excess Soils

Excess soil may be generated and removed off-site during the construction activities associated with the proposed site works. The management of excess soil is now governed by O.Reg. 406/19, MECP document entitled “On-Site and Excess Soil Management Regulation”. In accordance with the regulation, the Project Leader is responsible for the handling, storage, reuse, transportation, and removal of all soil. To support off-site removal of excess soil, the following is required:

- Planning Documentation
 - Assessment of Past Use
 - Sampling and Analysis Plan
 - Excess Soil Characterization Report
 - Excess Soil Destination Report
- Tracking
- Registry
- Record Keeping

No testing was conducted during this geotechnical investigation; however, soil sampling and analysis may be required as per the above-noted MECP document and/or as per the requirement of the receiving site owner(s), depending on the volume of excess soil generated during construction. The analytical results and environmental assessment findings must be disclosed to the receiving site owner(s) and approval by the receiving site owner(s) be obtained prior to exporting/transferring the materials.

If any impacted soils are discovered during construction, CVD should be contacted for sampling and testing to determine the limit of the impacted soils.



6.0 CLOSURE

The Limitations of Report, as quoted in Appendix A, is an integral part of this report.

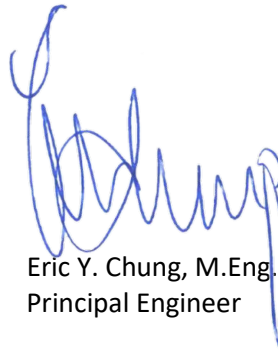
We trust that the information presented in this report is complete within our terms of reference. If there are any further questions concerning this report, please do not hesitate to contact our office.

Yours truly,

CHUNG & VANDER DOELEN ENGINEERING LTD.



Yaroslav Chudin, E.I.T.
Geotechnical Engineering Intern



Eric Y. Chung, M.Eng., P.Eng.
Principal Engineer



APPENDIX A

LIMITATIONS OF REPORT



APPENDIX “A”

LIMITATIONS OF REPORT

The conclusions and recommendations given in this report are based on information determined at the testhole locations. Subsurface and groundwater conditions between and beyond the testholes may differ from those encountered at the testhole locations, and conditions may become apparent during construction which could not be detected or anticipated at the time of the site investigation. It is recommended practice that the Soils Engineer be retained during construction to confirm that the subsurface conditions throughout the site do not deviate materially from those encountered in the testholes.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of testholes and their respective depths may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusion as to how the subsurface conditions may affect their work.

The benchmark and elevations mentioned in this report were obtained strictly for use in the geotechnical design of the project and by this office only, and should not be used by any other parties for any other purposes.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. CHUNG & VANDER DOELEN ENGINEERING LIMITED accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report. Since all details of the design may not be known, we recommend that we be retained during the final design stage to verify that the design is consistent with our recommendations, and that assumptions made in our analysis are valid.

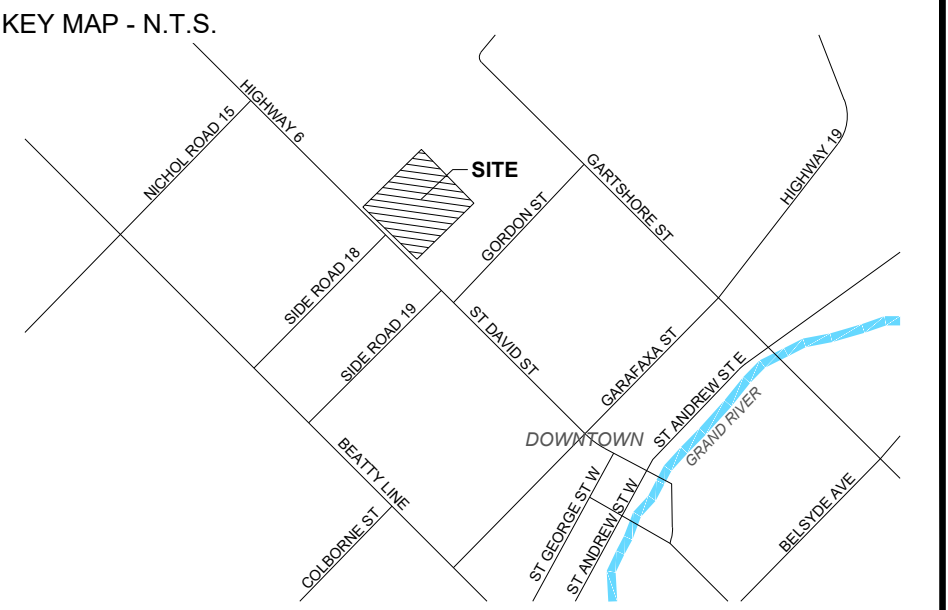
This report does not reflect the environmental issues or concerns unless otherwise stated in the report.



APPENDIX B

Draft Plan of Subdivision (Polocorp, December 10, 2024) & Drawing No. 1 – CVD Borehole Location Plan

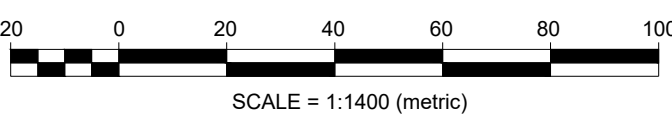




DRAFT PLAN OF SUBDIVISION

PT OF LOT 17, CONCESSION 16
IN THE FORMER GEOGRAPHIC TWP OF NICHOL
CENTRE WELLINGTON

POLOCORP INC.



LAND USE SCHEDULE

DESCRIPTION	LOTS/BLKS.	UNITS	AREA (ha.)
Single Detached	1-10	62-88	8.006
Street Townhouses	11-18	80-118	6.185
Medium Density	19, 20	71-102	1.617
Mixed Use	21	8-14	0.338
Existing House	22	-	0.330
Stormwater Management Facility	23	-	2.412
Trail	24	-	0.417
Parkland	25	-	0.806 (5.2%)
Pedestrian Walkway	26, 27	-	0.077
Environmental Feature & Buffer	28	-	3.340
MTO Allowance	29, 30	-	0.527
Roads	-	-	3.502
TOTAL	-	221-323	19.389

SALEABLE FRONTAGE	LENGTH	UNIT SMALL	UNIT LARGE
Single Detached	1,014.5m	36' (11.0m)	50' (15.2m)
Street Townhouses	530.0m	18' (5.5m)	27' (8.3m)
TOTAL	1,844.5m	-	-

DENSITY

Gross Area (ha)	19.389 ha (47.91 ac)
Developable Area (ha)	15.477 ha (38.25 ac)
Net Density (upha)	14.3 - 20.9 upha
Net People-Jobs (3.05 per unit)	43.6 - 63.8 PU pha

LEGEND

- Wetland Limit
- Wetland 30m Buffer

INFORMATION REQUIRED

UNDER SECTION 51 (17) OF THE PLANNING ACT, R.S.O. 1990, c.P.13 AS AMENDED
INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,g,j AND I ARE AS SHOWN ON THE DRAFT PLAN.
(h) Municipal Water Supply
(i) Sandy Loam
(k) Municipal Sanitary and Storm Sewers

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

O.L.S. XX XX, 2024
Surveying Inc. DATE

OWNER'S CERTIFICATE

I HEREBY CONSENT TO THE FILING OF THIS PLAN BY POLOCORP INC., IN DRAFT FORM

MIKE PUOPOLO DATE
Polocorp Inc.

APPROVALS

REGIONAL MUNICIPALITY OF
WATERLOO APPROVAL BLOCK

DRAFT
FOR DISCUSSION
PURPOSES ONLY

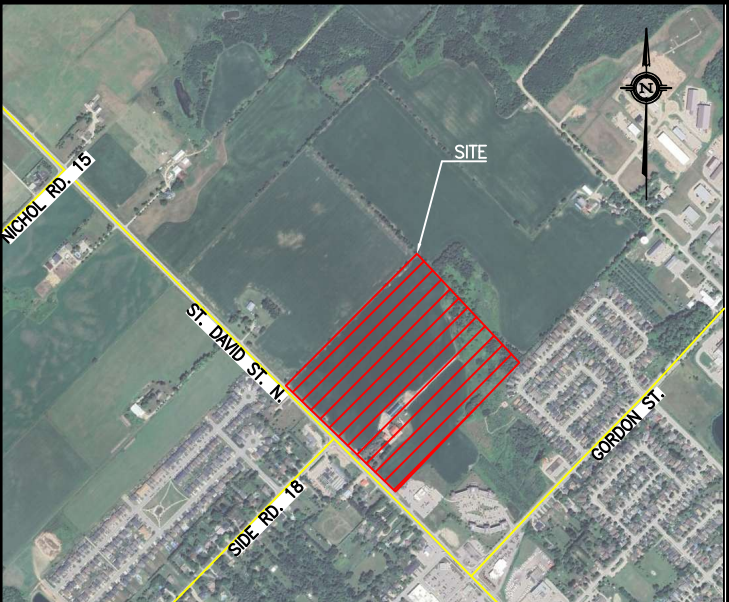
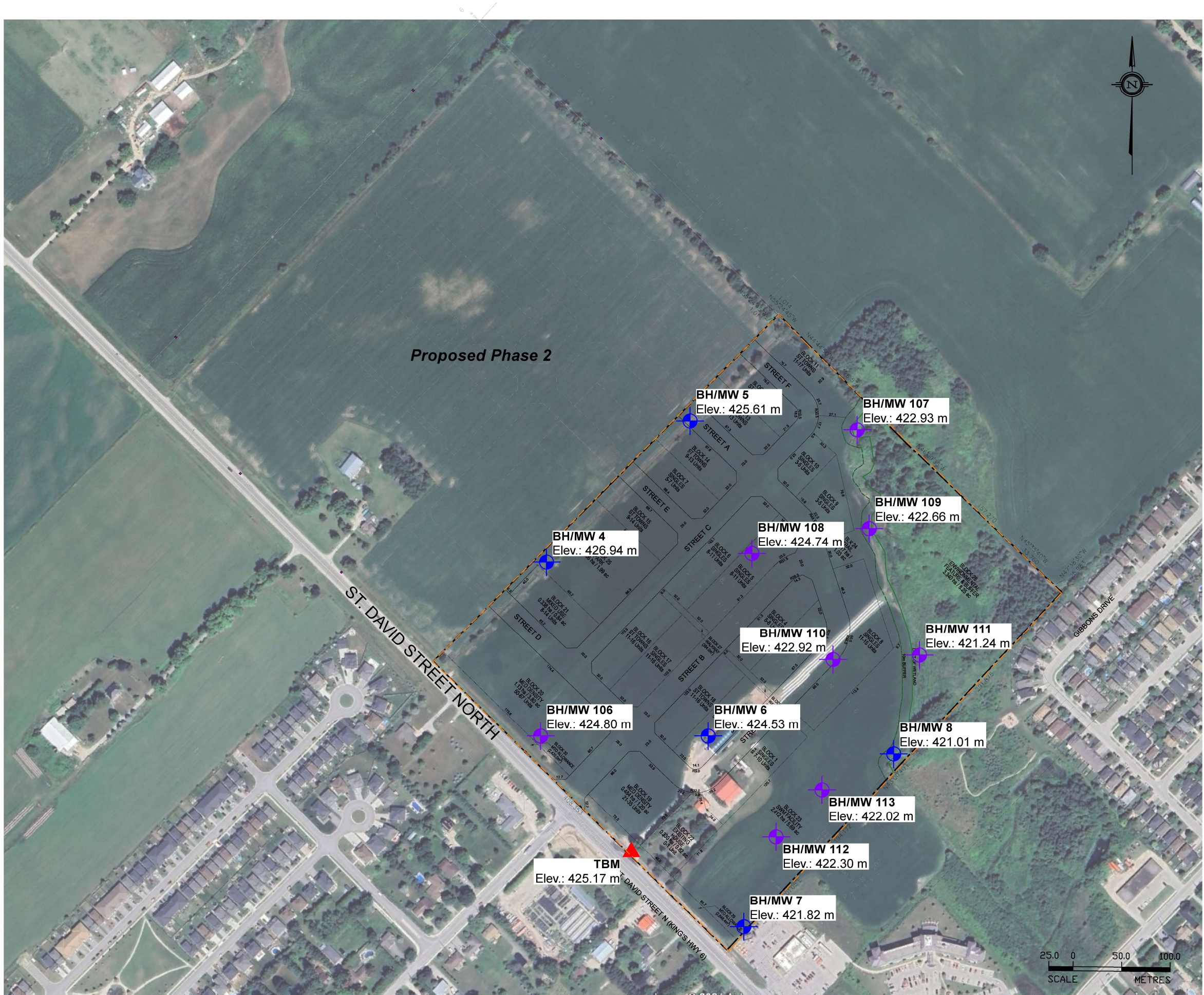
APPROVED: DATE:

DATE	BY	REVISIONS	DESCRIPTION

POLOCORP

379 Queen Street South, Kitchener | N2T 1W6 | 519-745-3249 | polocorpinc.com

DATE: December 10, 2024	SCALE 1:4000 (metric)
PROJECT: 1012 (Fergus)	DRAWN BY: GFE



KEY PLAN **SOURCE:** Google Earth

LEGEND

- TBM:** Top of fire hydrant nut, south of northern driveway entrance to 968 St. David Street North.
Elev.: 425.17 m (Geodetic)
- Borehole and Monitoring Well Location (January 2024)**
- Borehole and Monitoring Well Location (September 2024)**
- Site Boundary**

Image Ref.: Google Earth; Retrieved: May 1, 2024

Elev. Ref.: The borehole locations and associated ground surface elevations were surveyed using a Network RTK Global Navigation Satellite System (GNSS) Receiver. The survey data was collected using UTM Zone 17N Projection, NAD83(CSRS)v7-2010 datum and Canada Geoid Model HT2_2010v70 (CGVD28).

BOREHOLE LOCATION PLAN

Polocorp Fergus Subdivision - Phase 1

968 St. David Street North
Fergus, Ontario

 **CHUNG & VANDER DOELEN**
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1 / 519-742-8979

Drawn By: YC	Date: January 2025	File No.: 1495
Checked By: EYC	Scale: 1:4000	Drawing No.: 1

APPENDIX C

Single Well Response Test Analysis Charts





CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Response Test - Water Level Data and Analysis

Page 2 of 4

Project: Polocorp Fergus Subdivision

Number: 1495

Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON

Response Test: BH 5

Test Conducted by: Y.C.

Test Date: 2024-03-11

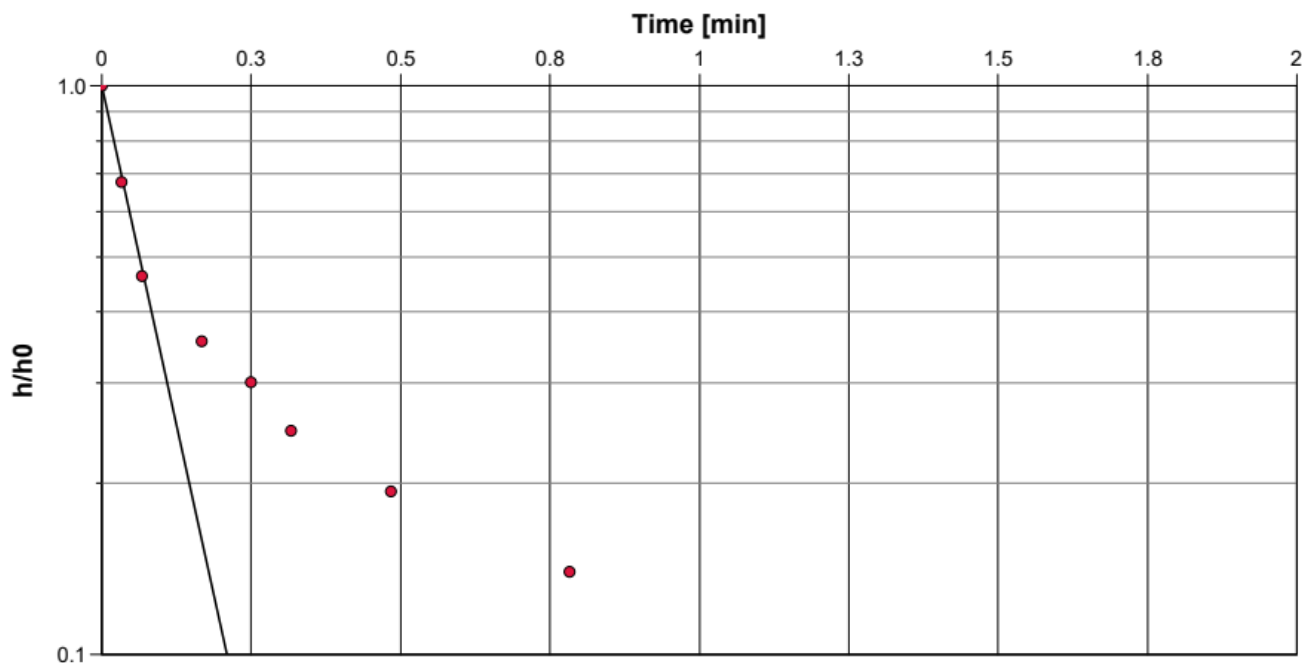
Aquifer Thickness: 6.20 m

Water level at t=0 [m]: 2.09

Static Water Level [m]: 1.99

Water level change at t=0 [m]: 0.09

	Time [min]	Water Level [m]	WL Change [m]
1	0	2.087	0.093
2	0.0333	2.057	0.063
3	0.0667	2.037	0.043
4	0.1667	2.027	0.033
5	0.25	2.022	0.028
6	0.3167	2.017	0.023
7	0.4833	2.012	0.018
8	0.7833	2.007	0.013
9	1.1167	2.002	0.008
10	1.55	2.00	0.006



Calculation using Bouwer & Rice

Observation Well

Hydraulic Conductivity
[m/s]

BH 5

8.69×10^{-5}



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Response Test - Water Level Data and Analysis

Page 3 of 4

Project: Polocorp Fergus Subdivision

Number: 1495

Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON

Response Test: BH 6

Test Conducted by: Y.C.

Test Date: 2024-03-11

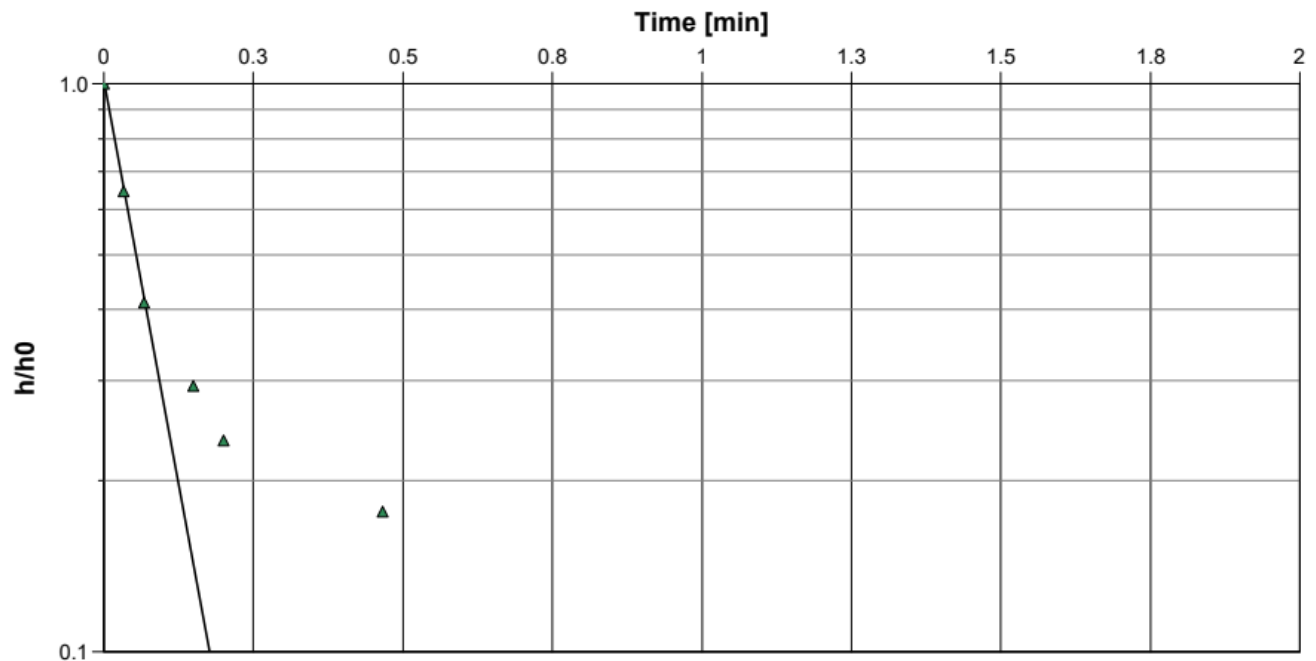
Aquifer Thickness: 3.10 m

Water level at t=0 [m]: 1.65

Static Water Level [m]: 1.56

Water level change at t=0 [m]: 0.08

	Time [min]	Water Level [m]	WL Change [m]
1	0	1.646	0.085
2	0.0333	1.616	0.055
3	0.0667	1.596	0.035
4	0.15	1.586	0.025
5	0.2	1.581	0.02
6	0.4667	1.576	0.015



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]
BH 6	8.91×10^{-5}



CHUNG & VANDER DOELEN ENGINEERING LTD.

311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Response Test - Water Level Data and Analysis

Page 4 of 4

Project: Polocorp Fergus Subdivision

Number: 1495

Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON

Response Test: BH 7

Test Conducted by: Y.C.

Test Date: 2024-03-11

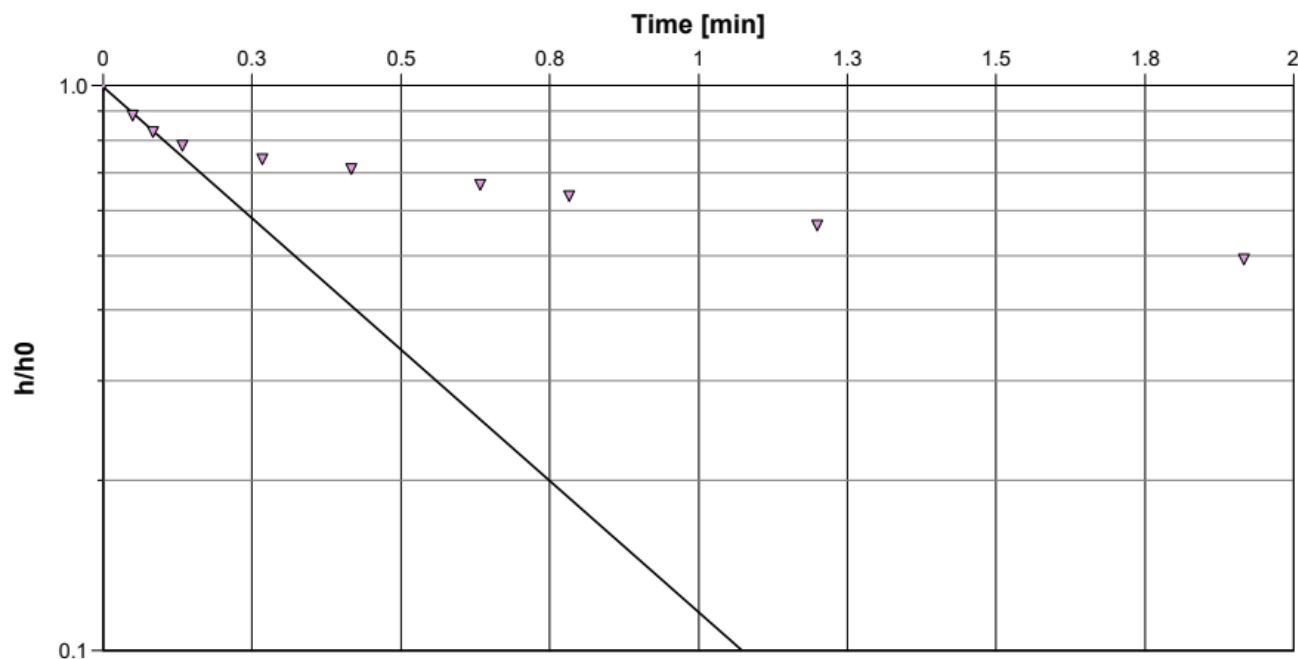
Aquifer Thickness: 1.50 m

Water level at t=0 [m]: 1.20

Static Water Level [m]: 0.51

Water level change at t=0 [m]: 0.69

	Time [min]	Water Level [m]	WL Change [m]
1	0	1.199	0.69
2	0.05	1.119	0.61
3	0.0833	1.079	0.57
4	0.1333	1.049	0.54
5	0.2667	1.019	0.51
6	0.4167	0.999	0.49
7	0.6333	0.969	0.46
8	0.7833	0.949	0.44
9	1.2	0.899	0.39
10	1.9167	0.849	0.34
11	2.6333	0.819	0.31
12	3.3833	0.799	0.29
13	3.9667	0.789	0.28
14	4.5167	0.779	0.27
15	5.1333	0.769	0.26



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]
BH 7	2.81×10^{-5}

APPENDIX D

**Table 1 – Summary of Groundwater Levels and Elevations &
Figure 5 – Water Table Contours Interpretation
(September 18, 2024)**



Table 1 - Summary of Water Levels, Elevations & Fluctuations

968 St. David Street North, Fergus
CVD Engineering Ltd.
Project: 1495

Well	Ground Elevation (mASL)	Top Pipe Elevation (mASL)	Pipe Length (m)	Hydraulic Conductivity (m/s)	Water Level (m Below Ground)							Water Elevation (m Above Sea Level)							Fluctuation Relative to February 6, 2024 (m)			
					10-Nov-23	12-Dec-23	06-Feb-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24	10-Nov-23	12-Dec-23	06-Feb-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24
BH 4	426.94	428.13	1.18	-			3.61	3.48	3.39		3.56			423.34	423.46	423.56		423.39	0.13	0.22		0.05
BH 5	425.61	426.87	1.26	9×10^{-5}			2.10	1.99	2.02		2.27			423.51	423.62	423.59		423.34	0.11	0.09		-0.17
BH 6	424.53	425.53	1.00	9×10^{-5}			1.62	1.56	1.66		1.90			422.91	422.97	422.87		422.63	0.06	-0.04		-0.27
BH 7	421.82	422.97	1.15	3×10^{-5}			0.41	0.51	0.71		1.14			421.41	421.31	421.12		420.68	-0.10	-0.30		-0.74
BH 8	421.01	422.12	1.11	-			0.44	0.25	0.52		0.73			420.58	420.76	420.50		420.28	0.18	-0.08		-0.29
BH 106	424.80	425.74	0.94	-						2.07	2.08						422.73	422.72				
BH 107	422.93	423.89	0.96	-						0.40	0.41						422.53	422.52				
BH 108	424.74	425.68	0.94	-						1.82	1.83						422.92	422.91				
BH 109	422.66	423.64	0.98	-						0.40	0.41						422.26	422.25				
BH 110	422.92	423.97	1.05	-						0.57	0.58						422.35	422.34				
BH 111	421.24	422.19	0.95	-						0.60	0.67						420.64	420.57				
BH 112	422.30	423.29	0.99	-						0.74	0.83						421.56	421.46				
BH 113	422.02	422.87	0.85	-						1.53	1.60						420.49	420.42				
DP 1 In	420.06	421.62	1.56	-	-0.33	-0.38	-0.34	-0.39	-0.36		-0.20	420.39	420.44	420.40	420.45	420.42		420.26				
DP 1 Out	420.06	421.62	1.56	-	-0.23	-0.20		-0.27	-0.23		-0.17	420.28	420.26		420.32	420.29		420.22				
DP 2 In	421.71	423.09	1.37	-	1.69	0.45	-0.01	-0.06	-0.06		0.10	420.02	421.26	421.73	421.77	421.78		421.61				
DP 2 Out	421.71	423.09	1.37	-	-0.08	-0.06		-0.08	-0.06			421.79	421.77		421.79	421.78						
DP 3S In	422.86	424.48	1.62	-					0.27		0.36					422.59		422.50				
DP 3S Out	422.86	424.48	1.62	-																		
DP 3D In	422.88	424.42	1.54	-	0.57	0.29	0.26	1.23	0.27		0.36	422.31	422.59	422.62		422.61		422.52				
DP 3D Out	422.88	424.42	1.54	-					-1.54							424.42						
DP 4S In	421.27	422.54	1.28	-						-0.15	-0.14						421.42	421.41				
DP 4S Out	421.27	422.54	1.28	-						-0.16	-0.16						421.43	421.43				
DP 4D In	421.29	422.71	1.42	-						1.28	1.05						420.01	420.24				
DP 4D Out	421.29	422.71	1.42	-						-0.11	-0.11						421.41	421.41				
DP 5S In	421.64	422.77	1.13	-						0.39							421.25					
DP 5S Out	421.64	422.77	1.13	-																		
DP 5D In	421.60	423.00	1.39	-						0.48	0.51						421.13	421.09				
DP 5D Out	421.60	423.00	1.39	-																		

- Notes:
- 1) All Elevations Referenced to Geodetic Survey by CVD.
 - 2) Bolded elevations represent the maximum water table aquifer elevation measured at each monitoring well throughout all seasons.
 - 3) Negative water level indicates that water level is above ground.
 - 4) : Monitoring well/piezometer dry
 - 5) Negative fluctuation indicates drop in water level relative to baseline.



LEGEND

- Property Boundary
- CVD Monitoring Well Location
- CVD Drive-Point Piezometer Location
- (424.19) Water Table Elevation (mASL) - September 18, 2024
- 424.50 Interpreted Groundwater Contour (mASL)
- Interpreted Shallow Groundwater Flow Direction

Scale 1:4000

Image Reference: Google Earth; Retrieved: May 1, 2024

Figure 5:
Water Table Interpretation (September 18, 2024)

Hydrogeological Assessment
 Polocorp Fergus Subdivision - Phase 1

968 St. David Street North & 6581 Highway 6
 Fergus, ON

CHUNG & VANDER DOELEN
 ENGINEERING LTD.

311 VICTORIA STREET NORTH
 KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979

ENCLOSURES



Soil Abbreviations and Terms Used on Record of Borehole Sheets

TERMINOLOGY DESCRIBING COMMON SOIL TYPES:

Topsoil	- mixture of soil and humus capable of supporting vegetation
Peat	- mixture of visible and invisible fragments of decayed organic matter
Till	- unstratified glacial deposit which may range from clay to boulders
Fill	- soil materials identified as being placed anthropologically

CLASSIFICATION (UNIFIED SYSTEM)

Clay	<0.002mm
Silt	0.002 to .075mm
Sand	0.075 to 4.75mm
	Fine 0.075 to 0.425 mm
	Medium 0.425 to 2.0 mm
	Coarse 2.0 to 4.75 mm
Gravel	4.75 to 75mm
	Fine 4.75 to 19 mm
	Coarse 19 to 75 mm
Cobbles	75 to 300mm
Boulders	>300mm

TERMINOLOGY

Soil Composition	% by Weight
"traces"	<10%
"some"(eg. some silt)	10-20%
Adjective (eg. sandy)	20-35%
"and"(eg. sand and gravel)	35-50%

Standard Penetration Resistance (SPT): Standard Penetration Resistance ('N' Values) refers to the number of blows required to advance a standard (ASTM D1586) 51 mm Ø (2 inch) split-spoon sampler by the use of a free falling, 63.5 Kg (140lbs) hammer. The number of blows from the drop weight is recorded for every 15 cm (6 inches). The hammer is dropped from a distance of 0.76m (30 inches) providing 474.5 Joules per blow. When the sampler is driven a total of 45 cm (18 inches) into the soil, the standard penetration index ('N' Value) is the total number of blows for the last 30 cm (12 inches).

Dynamic Cone Penetration Resistance (DCPT): Dynamic Cone Penetration Resistance is similar to a SPT with the 474.5 Joule/blow impulse provided by the free falling hammer where the split-spoon sampler is replaced by a 51 mm Ø, 60° conical point and the number of blows is recorded continuously for every 30 cm (12 inches).

COHESIVE SOILS CONSISTENCY

	(kPa)	(P.S.F.)	Nominal 'N' Value
Very Soft	<12	<250	0-2
Soft	12-25	250-500	2-4
Firm	25-50	500-1000	4-8
Stiff	50-100	1000-2000	8-15
Very Stiff	100-200	2000-4000	15-30
Hard	>200	>4000	>30

RELATIVE DENSITY OF COHESIONLESS SOIL

	'N' Value
Very Loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

MOISTURE CONDITIONS:

Cohesive Soil
DTPL- Drier than plastic limit
APL- About plastic limit
WTPL- Wetter than plastic limit
MWTPL- Much wetter than plastic limit

Cohesionless Soil
Damp
Moist
Wet
Saturated

SAMPLE TYPES AND ADDITIONAL FIELD TESTS

SS	Split Spoon Sample (obtained from SPT)	GS	Grab Sample	PP	Pocket Penetrometer
AS	Auger Sample	BS	Bulk Sample	VANE	Peak & Remolded shear
		TW	Thin Wall Sample or Shelby Tube	DMT	Flat Plate Dilatometer

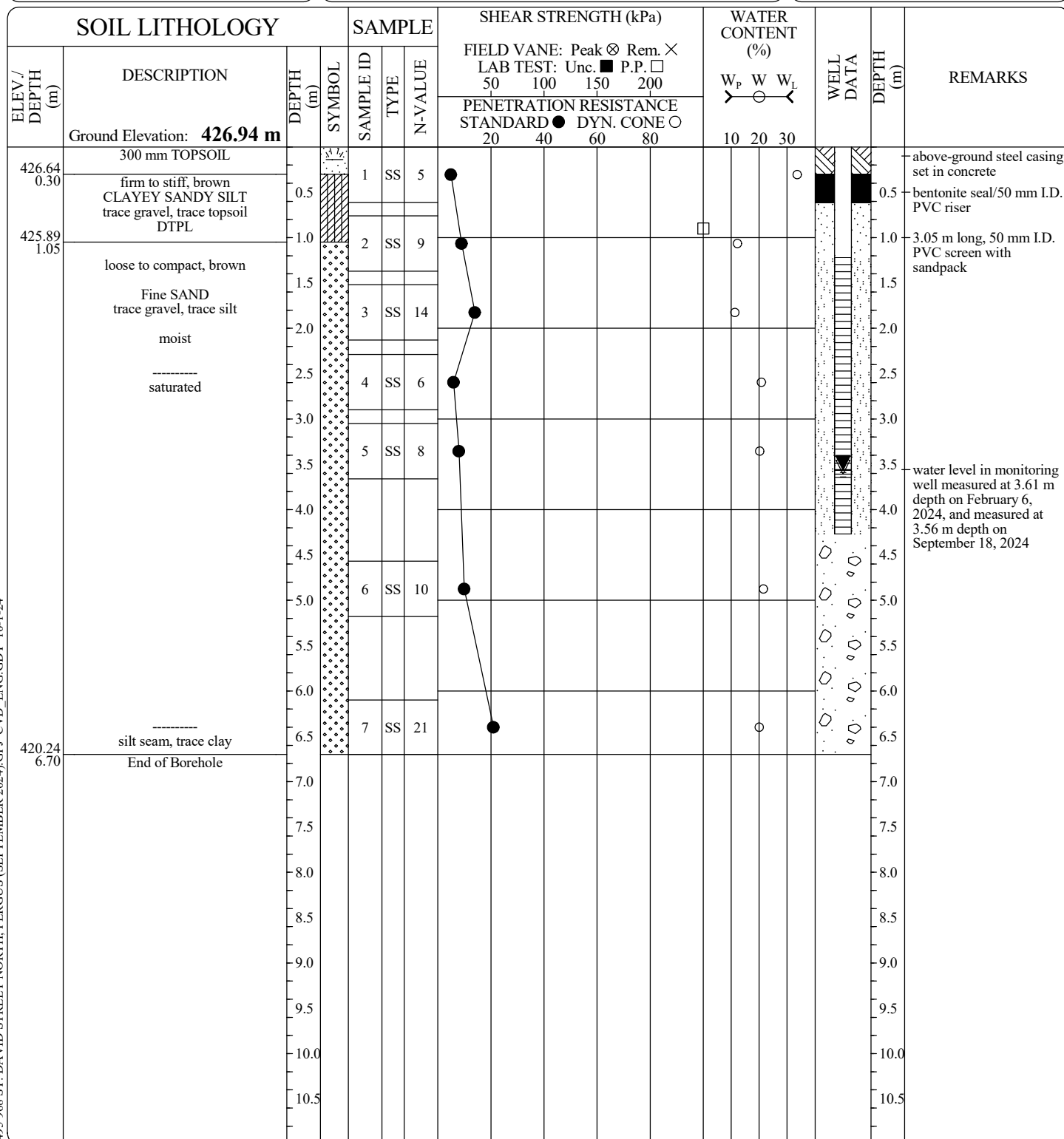
LABORATORY TESTS

SG	Specific Gravity	S	Sieve Analysis	W	Water Content
H	Hydrometer	P	Field Permeability	K	Lab Permeability
W_p	Plastic Limit	W_l	Liquid Limit	I_p	Plasticity Index
GSA	Grain Size Analysis	C	Consolidation	UNC	Unconfined compression



CHUNG & VANDER DOELEN
ENGINEERING LTD.

Enclosure A

FILE No: 1495**BOREHOLE No. 4**Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario****EQUIPMENT DATA**Machine: **CME-55 Track**Method: **Solid Stem Auger**Size: **152 mm O.D.**Date: **Jan 16 - 24 TO Jan 16 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 5

Enclosure No.: 5

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Jan 16 - 24 TO Jan 16 - 24**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. ×				LAB TEST: Unc. ■ P.P. □					
							50 100 150 200				PENETRATION RESISTANCE					
							STANDARD ● DYN. CONE ○				W _p W W _L					
							20 40 60 80				10 20 30					
425.43 0.18	180 mm TOPSOIL			1	SS	5	●						○			above-ground steel casing set in concrete
	loose, orangey brown	0.5														bentonite seal/50 mm I.D. PVC riser
	SANDY SILT	1.0		2	SS	4	●							○		3.05 m long, 50 mm I.D. PVC screen with sandpack
	trace topsoil	1.5														
	moist to wet	2.0		3	SS	5	●							○		
423.76 1.85	loose to compact, brown	2.5														
	Fine SAND	3.0		4	SS	7	●							○		
	trace silt	3.5														
	wet to saturated	4.0		5	SS	9	●							○		
		4.5														
		5.0		6	SS	9	●							○		
		5.5														
		6.0														
		6.5		7	SS	12	●							○		
		7.0														
		7.5														
		8.0		8	SS	13	●							○		
417.36 8.25	silt seam, trace clay	8.5														
	End of Borehole	9.0														
		9.5														
		10.0														
		10.5														

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 6



Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus,
Ontario**

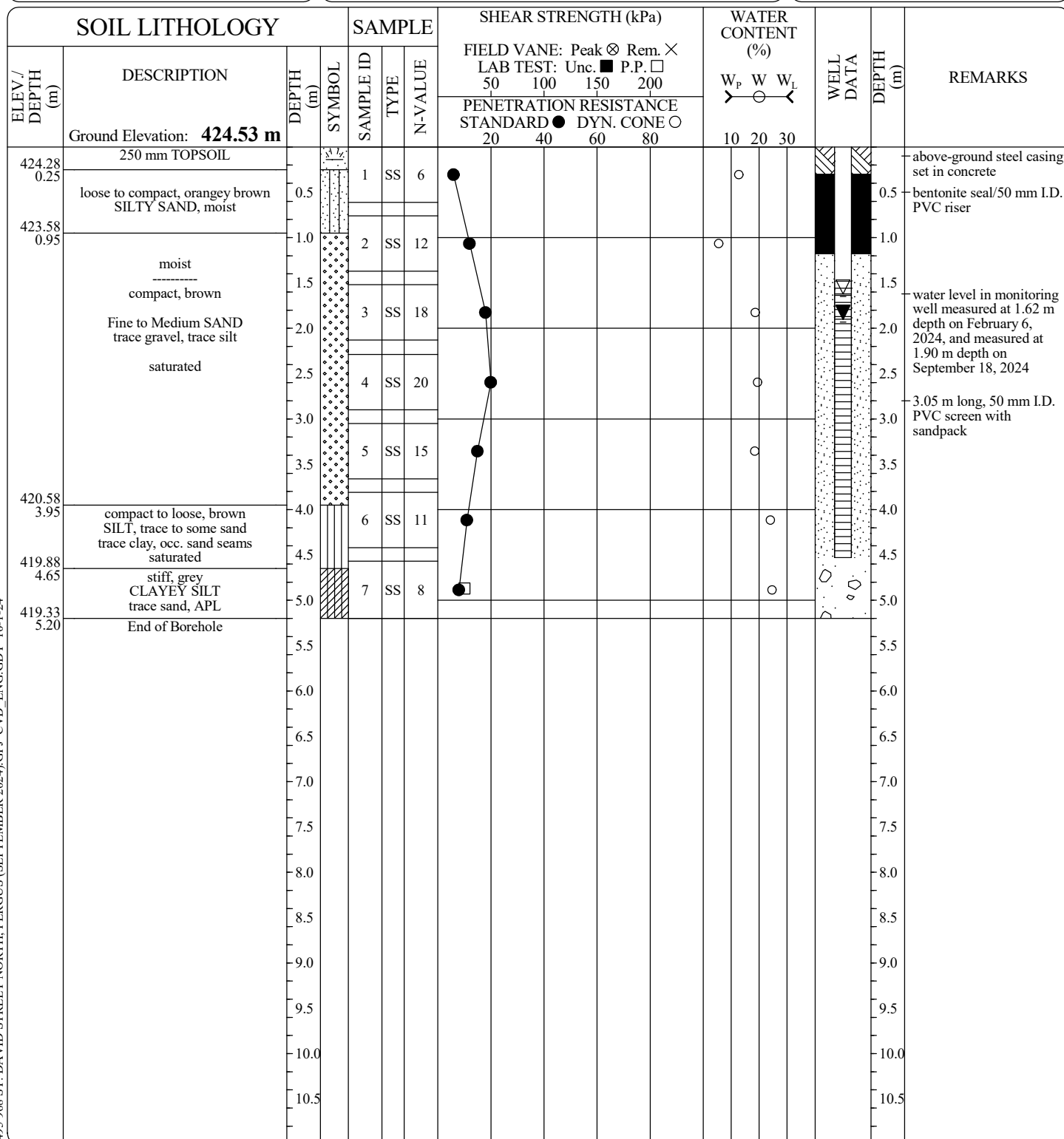
EQUIPMENT DATA

Machine: **CME-55 Track**

Method: **Hollow Stem Auger**

Size: **83 mm I.D.**

Date: **Jan 15 - 24 TO Jan 15 - 24**



PROJECT MANAGER: **EYC**

**CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

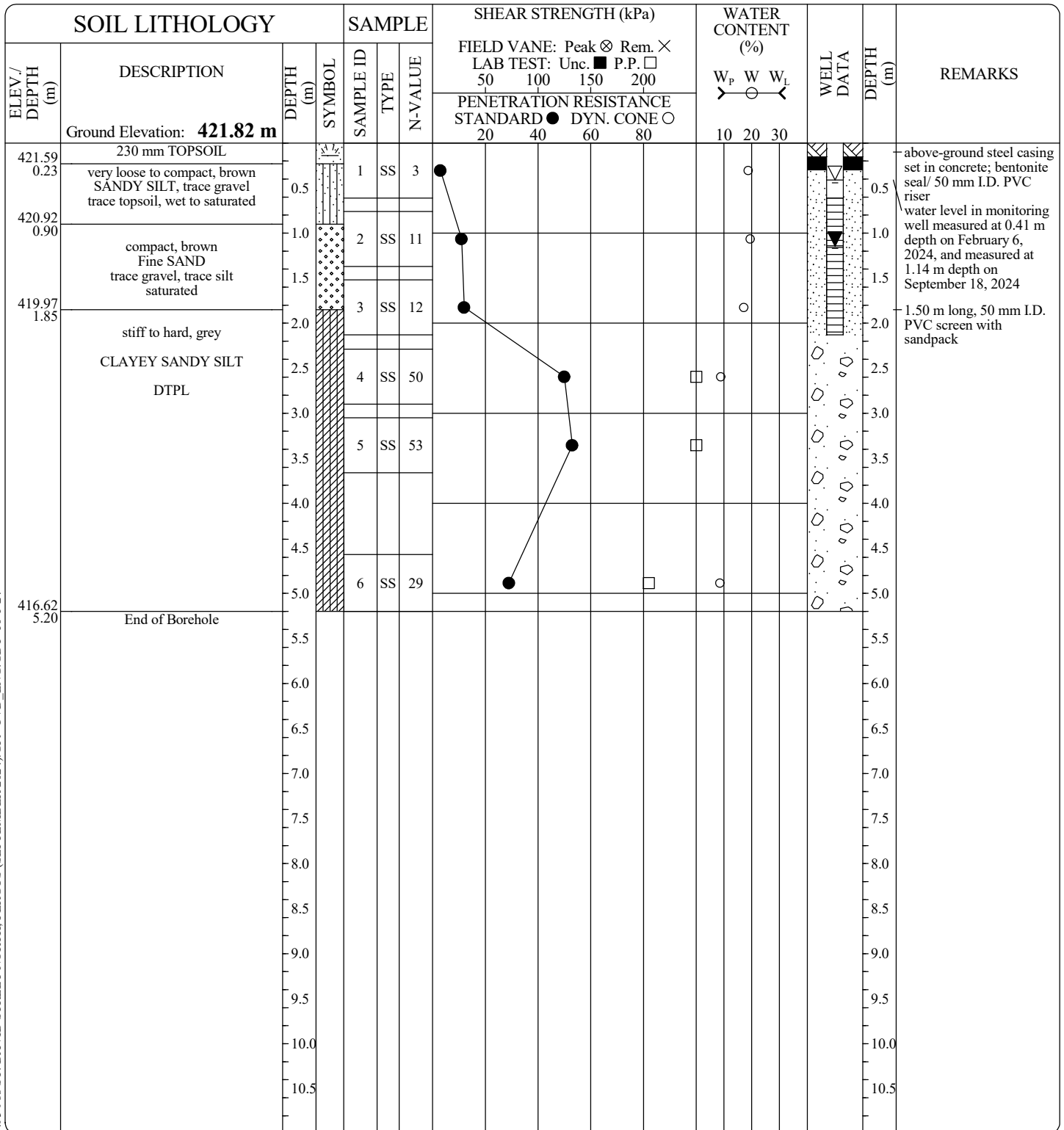
BOREHOLE No. 7

Enclosure No.: 7

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Jan 15 - 24 TO Jan 15 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495

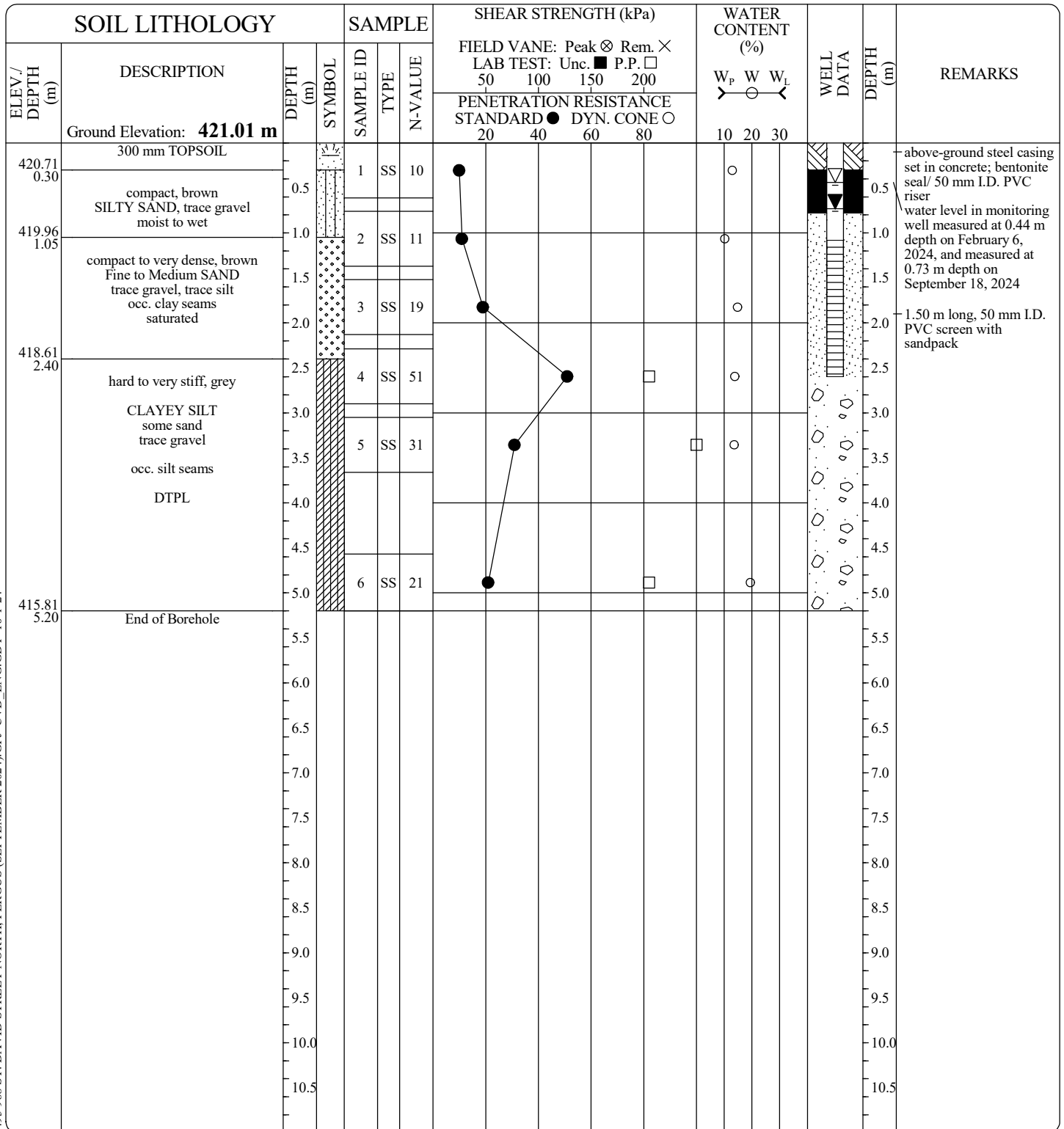
BOREHOLE No. 8

Enclosure No.: 8

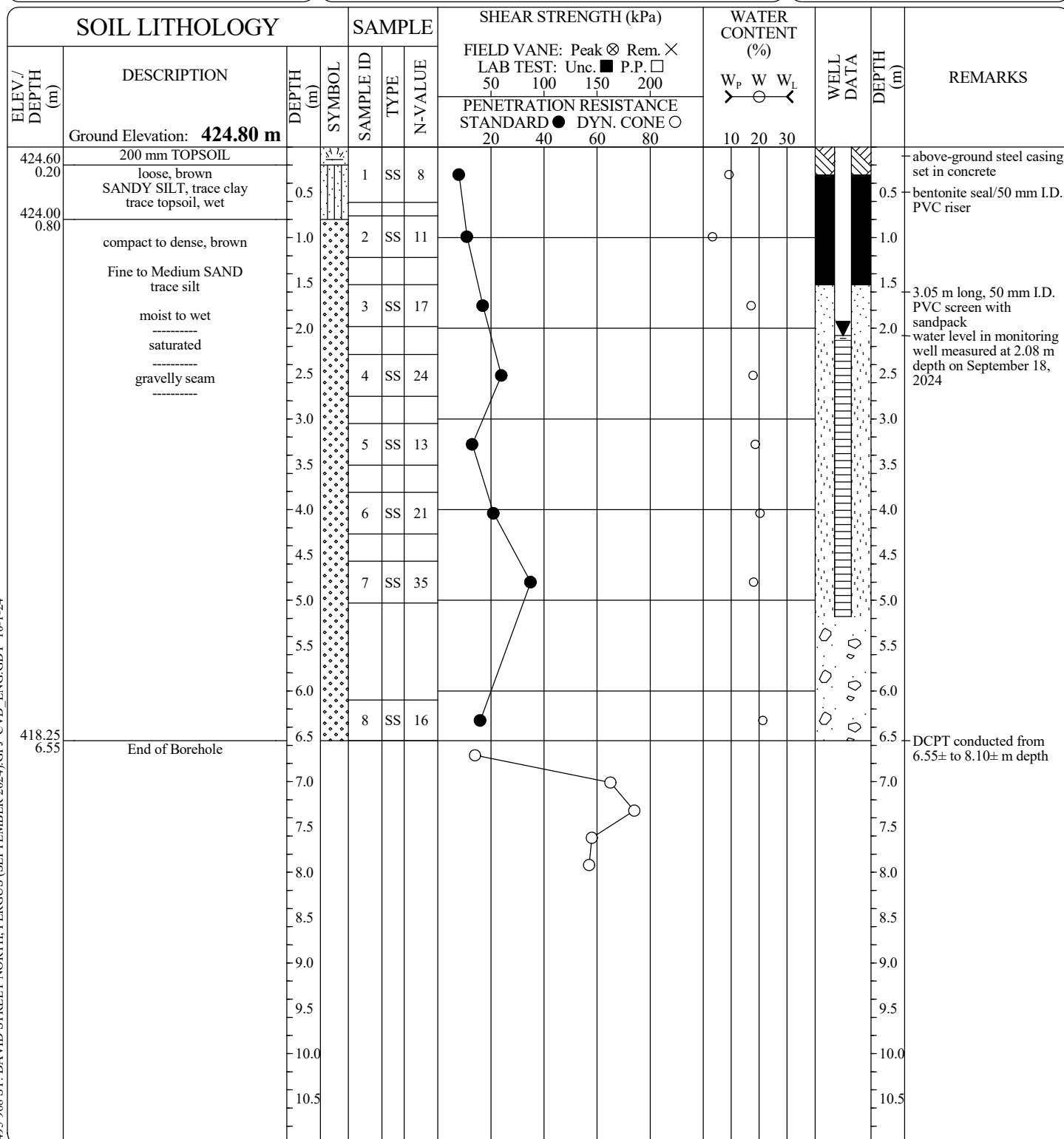
Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Jan 15 - 24 TO Jan 15 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495**BOREHOLE No. 106**Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus, Ontario****EQUIPMENT DATA**Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 09 - 24 TO Sep 09 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 107

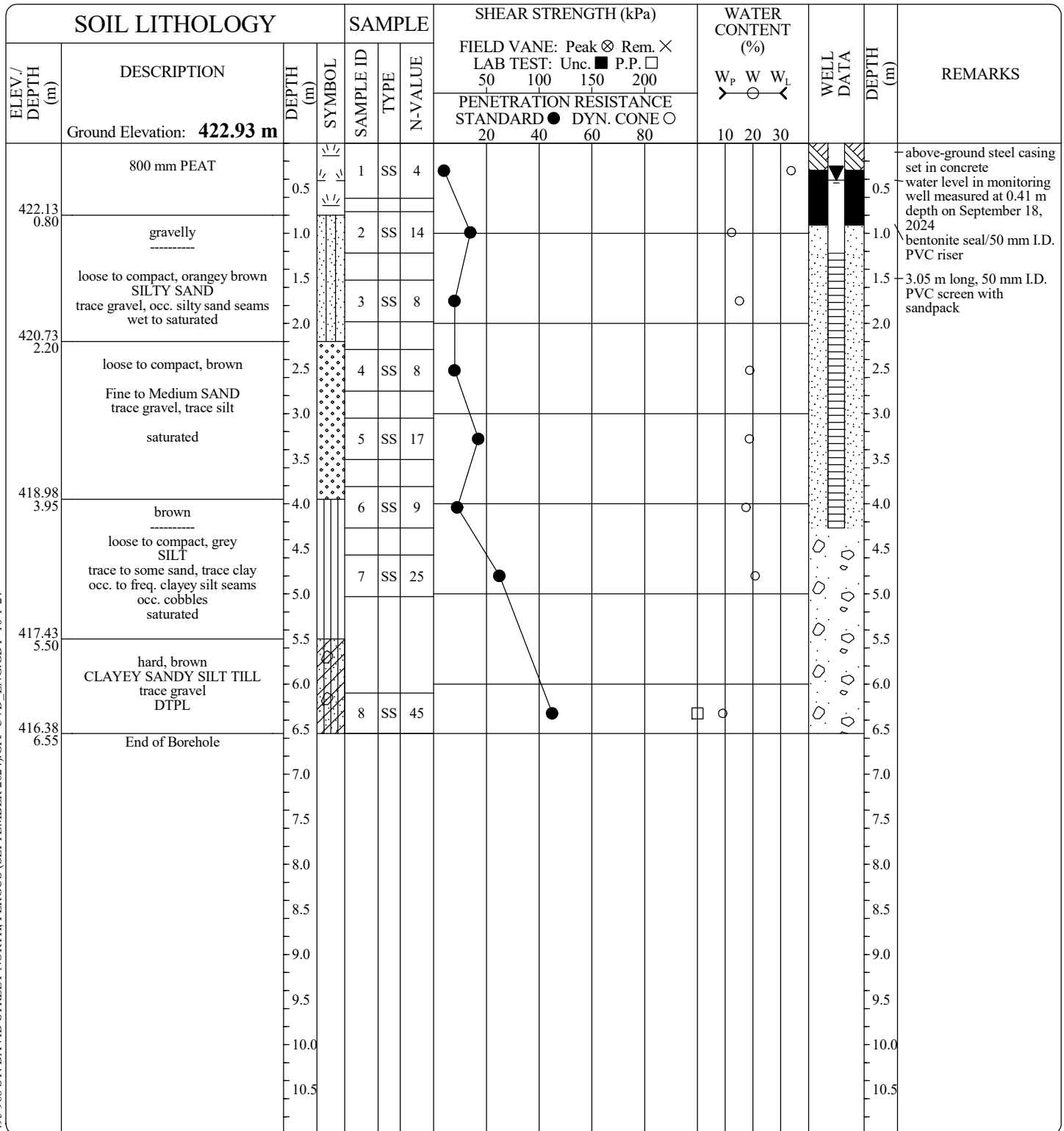
Enclosure No.: 15

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 09 - 24 TO Sep 09 - 24**

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024) GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 108

Enclosure No.: 16

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 09 - 24 TO Sep 09 - 24**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS		
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □				WATER CONTENT (%) W _p W W _L						
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○										
	Ground Elevation: 424.74 m						20	40	60	80	10	20	30				
424.49 0.25	250 mm TOPSOIL			1	SS	5	●					○				above-ground steel casing set in concrete	
423.39 1.35	loose to compact, brown SANDY SILT occ. clay silt seams moist	0.5													0.5	bentonite seal/50 mm I.D. PVC riser	
		1.0		2	SS	14	●					○			1.0		
		1.5													1.5		
		2.0		3	SS	14	●					○			2.0		water level in monitoring well measured at 1.83 m depth on September 18, 2024
		2.5		4	SS	12	●					○			2.5		
		3.0													3.0		
419.99 4.75	loose to compact, brown Fine to Medium SAND trace gravel, trace silt wet to saturated	3.5		5	SS	10	●					○			3.5		
		4.0		6	SS	9	●					○			4.0		
		4.5													4.5		
		5.0		7	SS	14	●					○			5.0		
		5.5													5.5		
		6.0													6.0		
418.19 6.55	End of Borehole	6.5		8	SS	8	●					○			6.5		
		7.0															
		7.5															
		8.0															
		8.5															
		9.0															
		9.5															
		10.0															
		10.5															

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ_CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 109

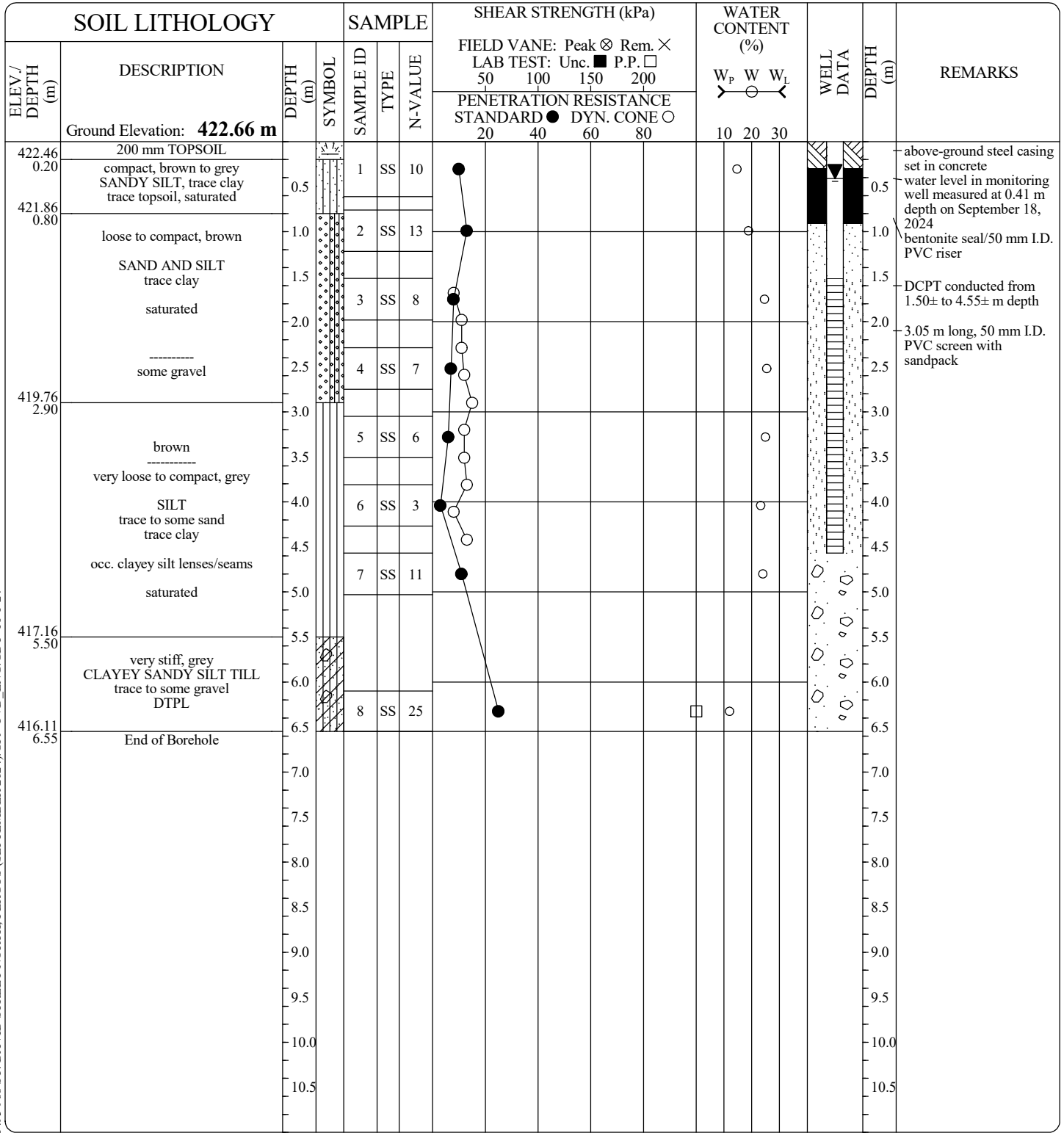
Enclosure No.: 17

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 09 - 24 TO Sep 09 - 24**

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024) GPJ_CVD_ENG.GDT 10-1-24

BOREHOLE No. 110



Location: **968 St. David Street North, Fergus,
Ontario**

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 10 - 24 TO Sep 10 - 24**

[illegible]

CVDBOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ CVD ENG.GDT 10-1-24

PROJECT MANAGER: EYC

CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 111

Enclosure No.: 19

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 10 - 24 TO Sep 10 - 24**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □				W _P W W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○				↔ ○ ↔					
Ground Elevation: 421.24 m											10 20 30					
420.94 0.30	300 mm TOPSOIL			1	SS	10	●						○			above-ground steel casing set in concrete; bentonite seal/50 mm I.D. PVC riser water level in monitoring well measured at 0.67 m depth on September 18, 2024 3.05 m long, 50 mm I.D. PVC screen with sandpack
	compact, orangey brown SANDY SILT trace gravel, trace clay moist	0.5					●						○			
419.89 1.35	stiff, brown CLAYEY SILT, trace gravel trace sand, occ. silt seams DTPL	1.5		2	SS	15		●					○			
		2.0						●			□		○			
419.09 2.15	compact, brown Fine to Medium SAND trace to some gravel trace silt saturated	2.5		3	SS	12			●					○		
		3.0							●							
417.89 3.35	brown silt seam stiff to hard, grey CLAYEY SANDY SILT TILL trace to some gravel trace sand	3.5		4	SS	14				●				○		
		4.0														
	occ. silt lenses DTPL	4.5		5	SS	12								○		
		5.0		6	SS	23						□		○		
		5.5														
		6.0		7	SS	25						□		○		
		6.5														
414.69 6.55	End of Borehole	6.5		8	SS	35							□	○		
		7.0														
		7.5														
		8.0														
		8.5														
		9.0														
		9.5														
		10.0														
		10.5														

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ_CVD_ENG.GDT 10-1-24

FILE No: 1495

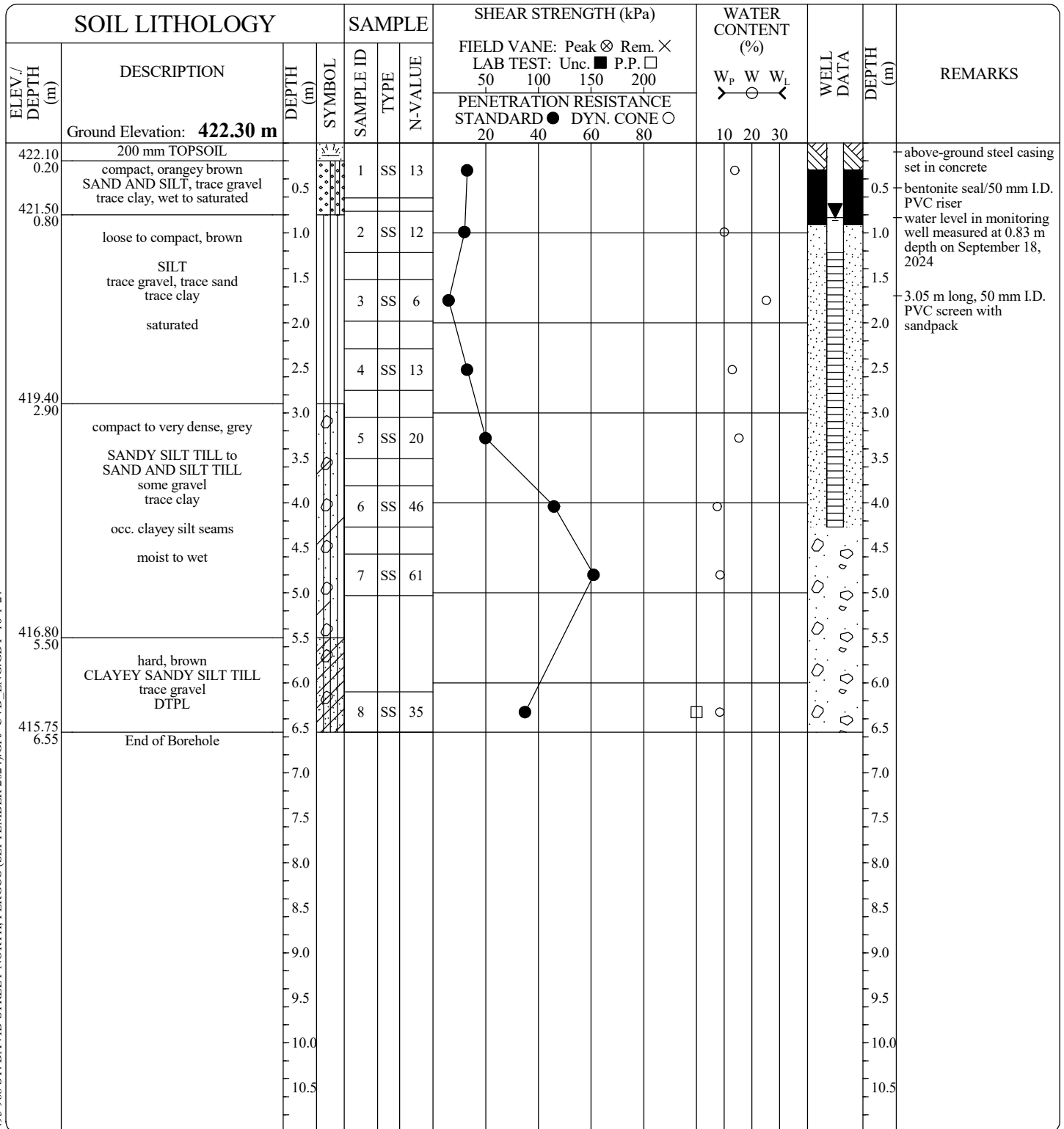
BOREHOLE No. 112

Enclosure No.: 20

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 10 - 24 TO Sep 10 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 113



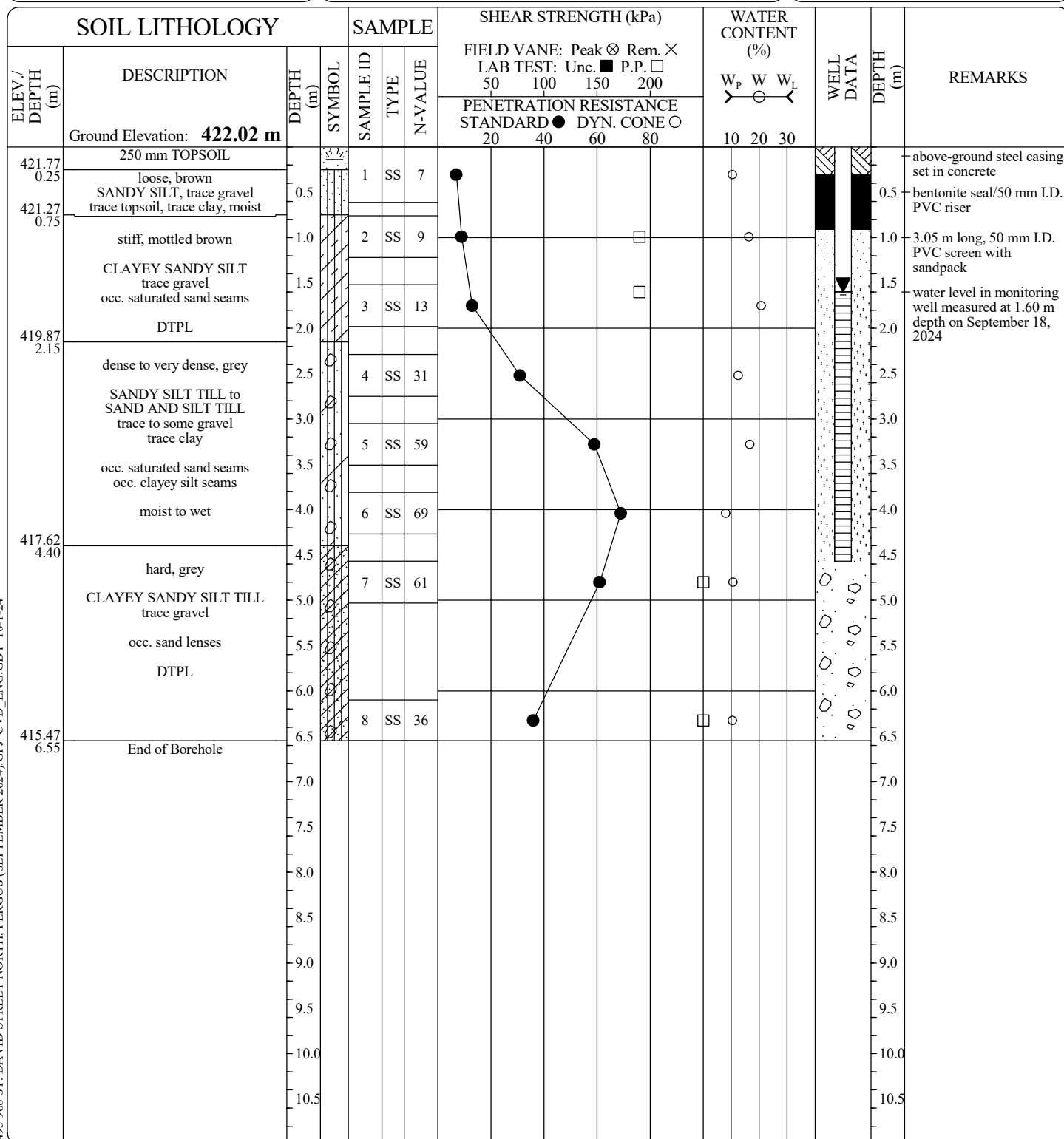
Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 10 - 24 TO Sep 10 - 24**

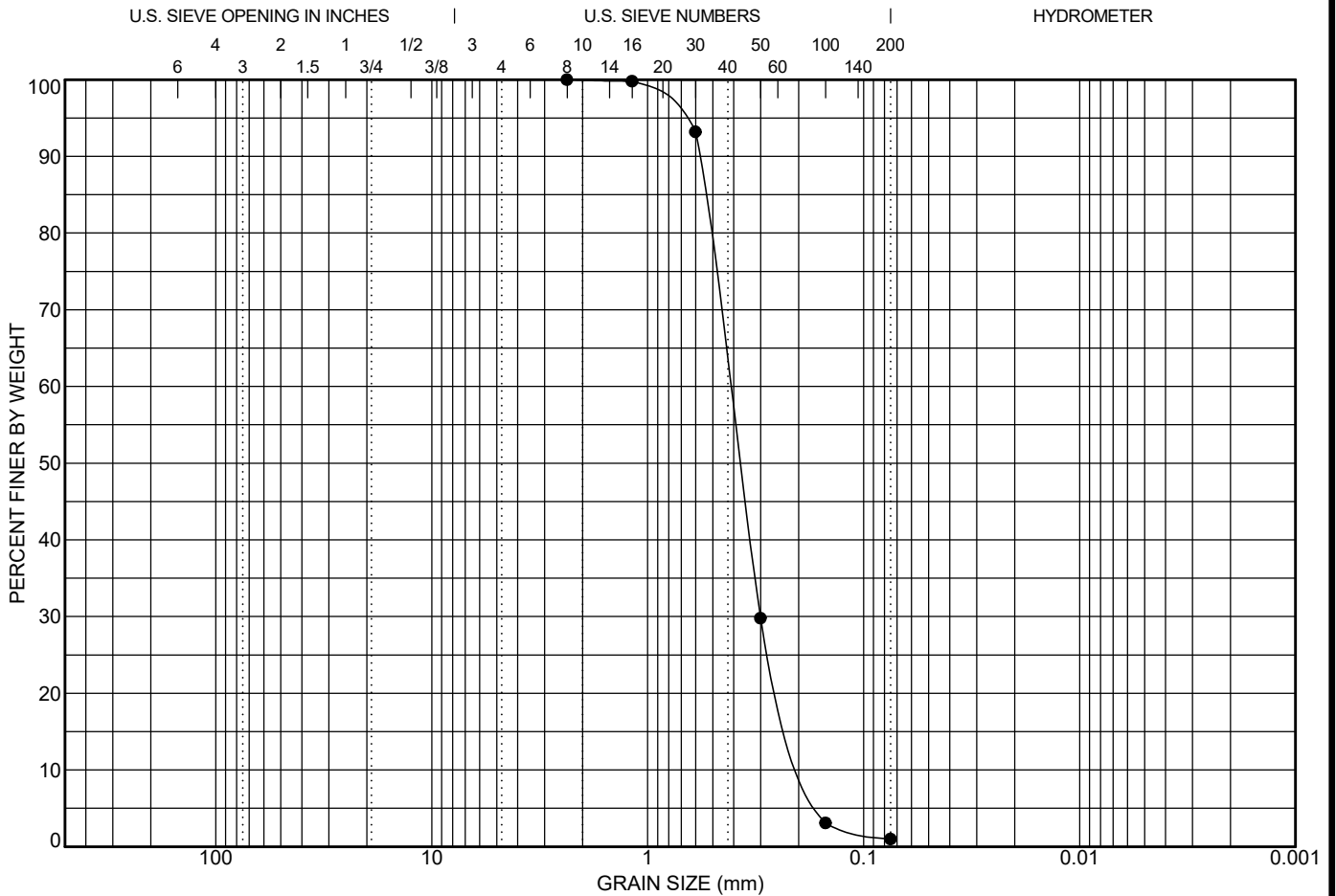


PROJECT MANAGER: **EYC**

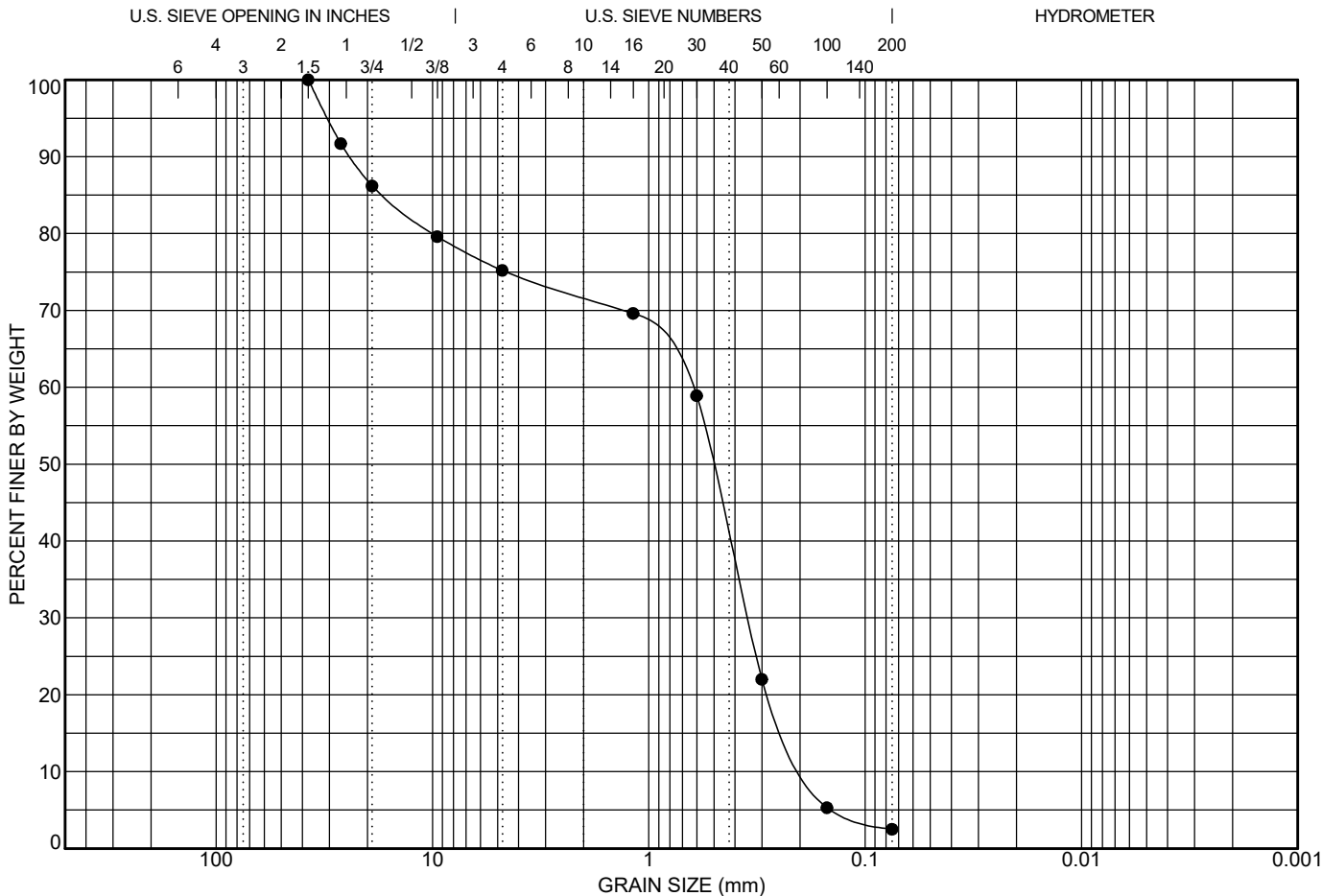
**CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.04	3.53	37.5	0.643	0.349	0.182	24.8	72.7	2.5	

Date: Sep. 25 - 2024		Sieve Size (mm)	Percent Passing	No Specifications
Client: PoloCorp Inc.				
Contractor:				
Source:				
Sampled From: BH 108 - SA 4, 2.30 to 2.75 m depth				
Sample No.: 108-4				
Date Sampled: Sep. 09 - 2024				
Sampled By: RS				
Lab No.: 1038				
Date Tested: Sep. 25 - 2024				
Type of Material: Gravelly Sand, trace silt				

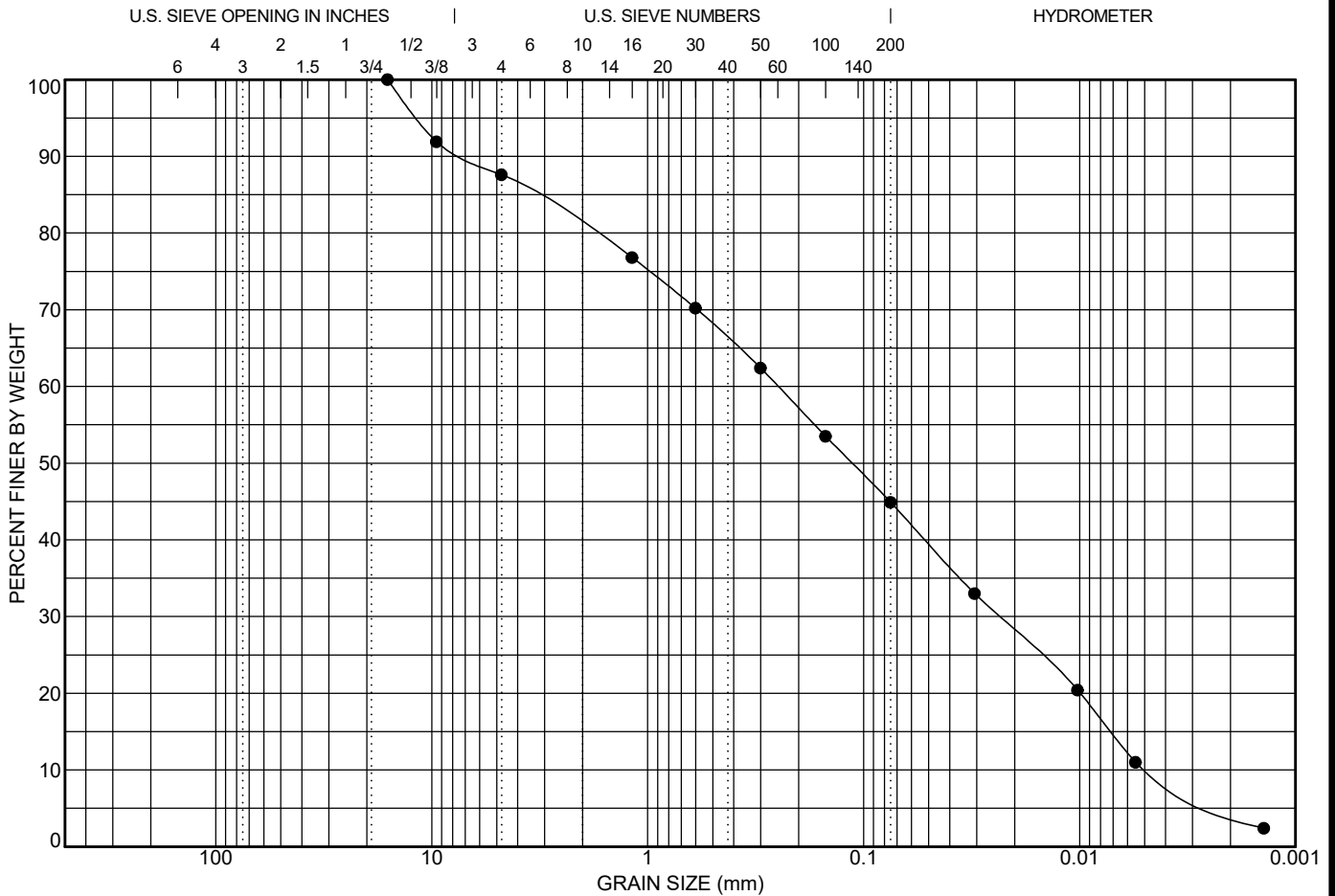


CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Residential Subdivision
Location: 968 St. David Street North, Fergus, Ontario
File No.: 1495
Enclosure No.: 25

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			0.48	53.05	16	0.249	0.024	0.005	12.4	42.7	44.9	

Date: Sep. 25 - 2024		Sieve Size (mm)	Percent Passing	No Specifications
Client: PoloCorp Inc.				
Contractor:				
Source:				
Sampled From: BH 109 - SA 4, 2.30 to 2.75 m depth				
Sample No.: 109-4				
Date Sampled: Sep. 09 - 2024				
Sampled By: RS				
Lab No.: 1037				
Date Tested: Sep. 25 - 2024				
Type of Material: Sand and Silt, some gravel, trace clay				

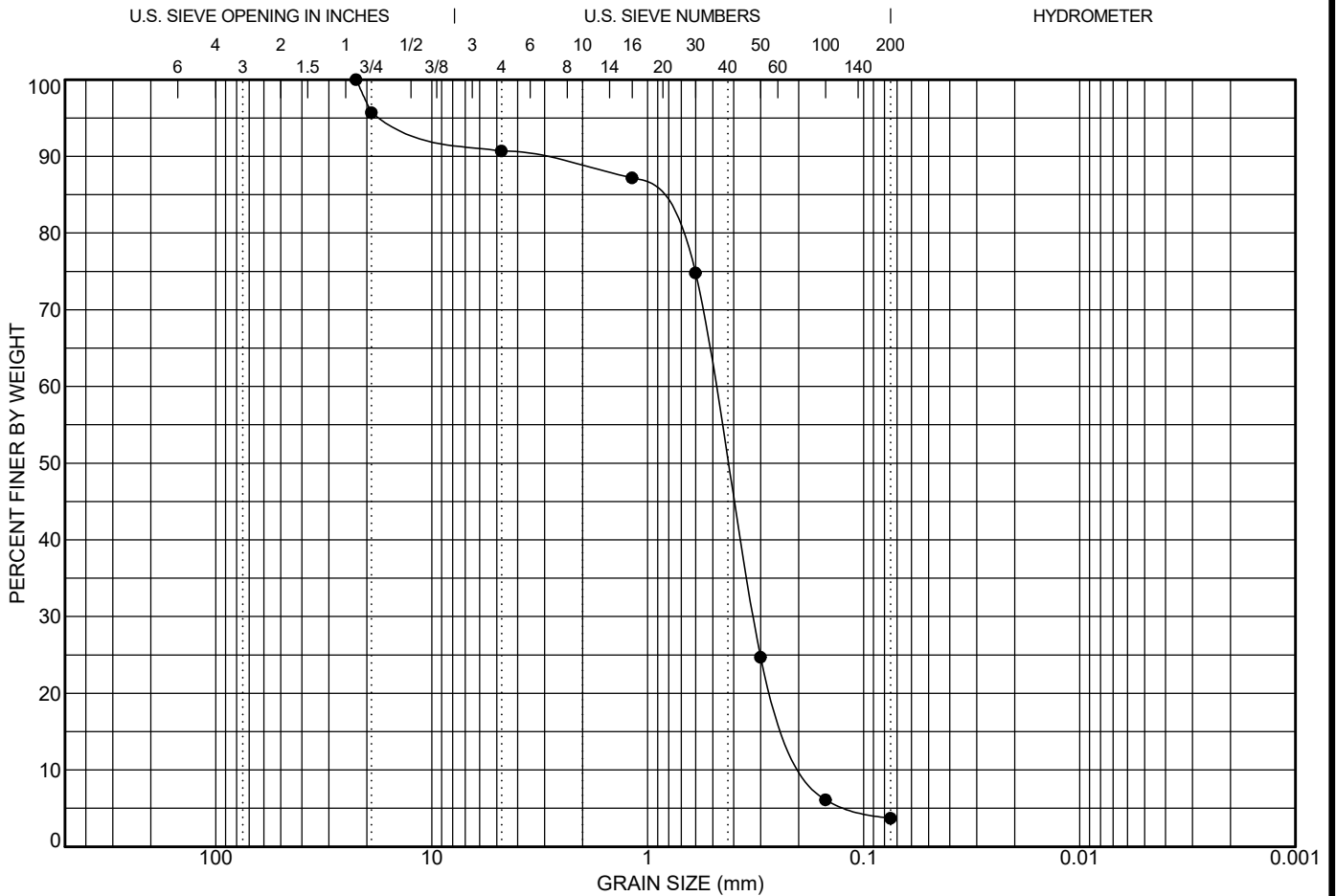


CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Residential Subdivision
Location: 968 St. David Street North, Fergus, Ontario
File No.: 1495
Enclosure No.: 26

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.23	2.82	22.4	0.489	0.323	0.173	9.3	87.0	3.7	

Date: Sep. 25 - 2024		Sieve Size (mm)	Percent Passing	No Specifications
Client: PoloCorp Inc.				
Contractor:				
Source:				
Sampled From: BH 111 - SA 4, 2.30 to 2.75 m depth				
Sample No.: 111-4				
Date Sampled: Sep. 10 - 2024				
Sampled By: RS				
Lab No.: 1036				
Date Tested: Sep. 25 - 2024				
Type of Material: Fine to Medium Sand, trace gravel, trace silt				

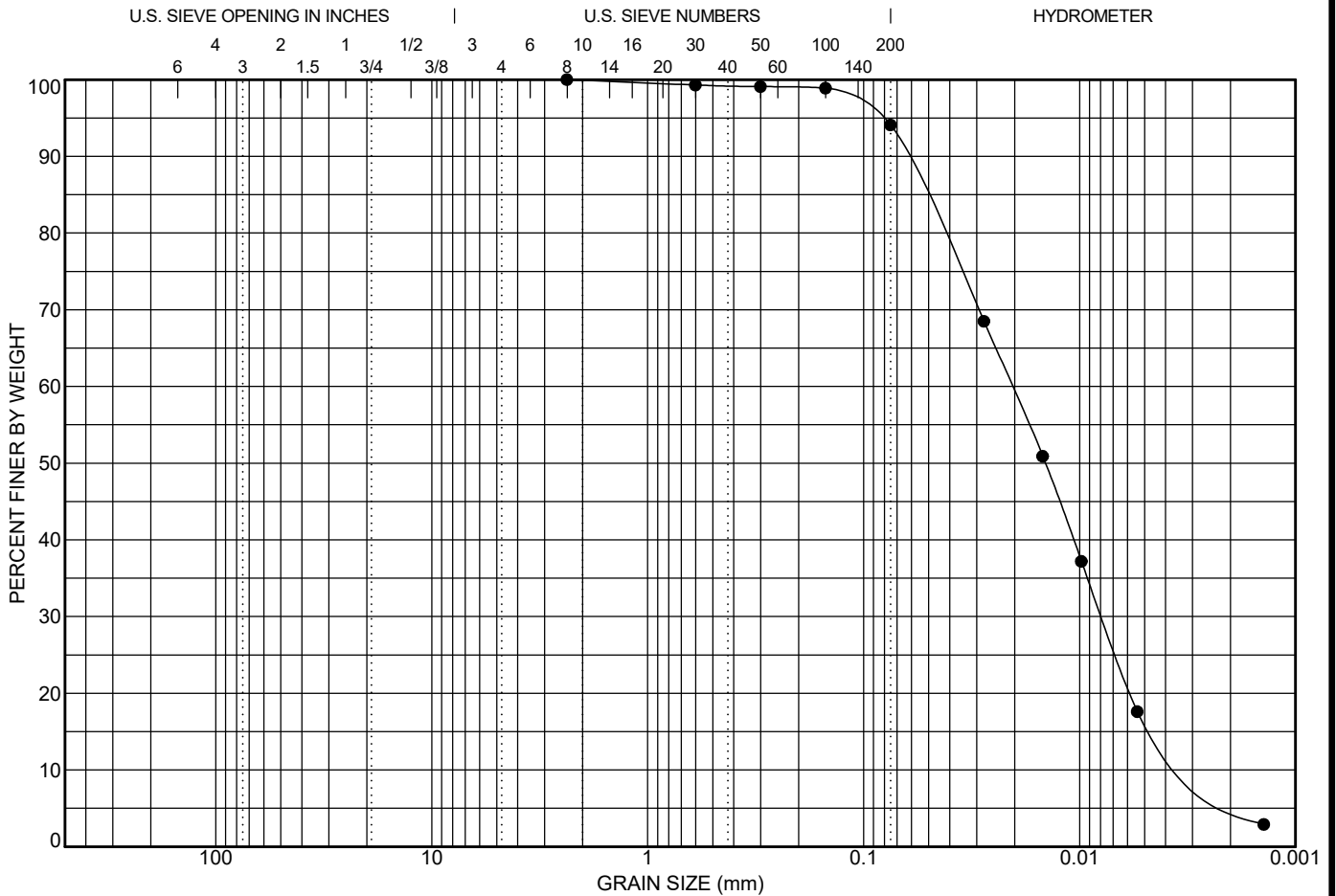


CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Residential Subdivision
Location: 968 St. David Street North, Fergus, Ontario
File No.: 1495
Enclosure No.: 27

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.13	7.62	2.36	0.02	0.008	0.003	0.0	5.9	94.1	

Date: Sep. 25 - 2024		Sieve Size (mm)	Percent Passing	No Specifications
Client: PoloCorp Inc.				
Contractor:				
Source:				
Sampled From: BH 112 - SA 4, 2.30 to 2.75 m depth				
Sample No.: 112-4				
Date Sampled: Sep. 10 - 2024				
Sampled By: RS				
Lab No.: 1039				
Date Tested: Sep. 25 - 2024				
Type of Material: Silt, trace sand, trace clay				



CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

Project: Proposed Residential Subdivision
Location: 968 St. David Street North, Fergus, Ontario
File No.: 1495
Enclosure No.: 28



CHUNG & VANDER DOELEN
ENGINEERING LTD.

**PRELIMINARY HYDROGEOLOGICAL INVESTIGATION
POLOCORP FERGUS SUBDIVISION – PHASE 1**

**968 St. David Street North
Fergus, Ontario**

SUBMITTED TO:

Mr. Mike Puopolo
Polocorp Inc.
379 Queen Street South
Kitchener, ON
N2G 1W6



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 5E1
519-742-8979

January 31, 2025
FILE NO.: 1495

Mr. Mike Puopolo
Polocorp Inc.
379 Queen Street South
Kitchener, ON
N2G 1W6

Dear Mr. Puopolo:

RE: Preliminary Hydrogeological Investigation
Polocorp Fergus Subdivision – Phase 1
968 St. David Street North, Fergus, Ontario

This report summarizes the preliminary results of a hydrogeological investigation completed in support of a proposed subdivision containing a combination of residential single units, stacked townhouses, mixed-use units, roadways, a stormwater management facility, parkland, and other environmental features located at 968 St. David Street North in Fergus, Ontario.

If you have any questions or concerns regarding the report, please contact the undersigned.

Yours truly,
CHUNG & VANDER DOELEN ENGINEERING LTD.

Peter Dao, M.Sc., P.Geo.
Manager, Environmental & Hydrogeology

TABLE OF CONTENTS

	Page
Letter of Transmittal	i
Table of Contents	ii
List of Appendices and Enclosures	iii
1.0 Introduction	1
2.0 Investigation Scope.....	2
2.1 Background Data Review.....	2
2.2 Borehole Drilling & Monitoring Well Installation	2
2.3 Drive-Point Piezometer Installation	3
2.3 Well Development, Water Level Monitoring, & Response Tests	3
3.0 Site Characterization.....	4
3.1 Topography, Drainage & Wetland Features	4
3.2 Geologic Setting.....	5
3.3 Hydrogeologic Setting	6
3.3.1 Water Table Depth and Configuration	6
3.3.2 Groundwater Infiltration and Recharge	6
3.3.3 Groundwater / Surface Water / Wetland Interaction	7
3.4 Source Water Protection And Groundwater Use	8
4.0 Water Budget Assessment.....	8
5.0 Site Servicing Requirements & Impact Assessment.....	10
5.1 Wastewater Systems & Potential Impact of Effluent.....	10
5.2 Water Supply & Potential Impact of Water Taking	10
5.3 Stormwater Management & Potential Impact to Groundwater Recharge.....	10
6.0 Conclusions & Recommendations	11
7.0 Closing.....	13
8.0 References	14



LIST OF APPENDICES AND ENCLOSURES

Appendix A	Draft Plan of Subdivision (Polocorp, December 10, 2024)
Appendix B	Figure 1 – Site Location Figure 2 – Quaternary Geology Figure 3 – Watershed Mapping (GRCA) Figure 4 – Monitoring Well and Piezometer Locations Figure 5 – Water Table Contours Interpretation (September 18, 2024)
Appendix C	Well Response Test Analysis Charts
Appendix D	Table 1 – Summary of Groundwater Levels and Elevations & Hydrograph
Appendix E	Water Balance Calculation
Appendix F	Water Chemistry Results (AGAT Laboratories of Mississauga, Ontario)
Appendix G	MECP Well Records
Appendix H	Limitations of Report
Enclosure A	Soil Abbreviations and Terms Used on Record of Borehole Log Sheets
Enclosures 4 to 8 & 14 to 21	Borehole Log Sheets
Enclosures 24 to 28	Grain Size Distribution Charts



1.0 INTRODUCTION

Chung & Vander Doelen Engineering Ltd. (CVD) has been retained by the 'Client', Polocorp Inc., to complete a hydrogeological investigation for the property located at 968 St. David Street North in Fergus, Ontario ("Site"), as part of the Phase 1 development of the Polocorp Fergus Subdivision. The currently planned development comprises of Lot 18, Concession 16 of the Subject Lands.

The purpose of the investigation is to evaluate existing hydrogeological conditions at the Site in support of a proposal for a residential subdivision and subsequent development, comprised of a combination of residential single units, stacked townhouses, mixed-use units, roadways, a stormwater management facility, and park.

This report presents the preliminary findings of the ongoing hydrogeological investigation, conducted between February and September 2024 for the proposed subdivision. At the time of the writing of this report, only a Draft Plan of Subdivision (Polocorp Inc., December 10, 2024), as provided in Appendix A, was available for our review.

The 19.39±-hectare (ha) Site is currently comprised of a cultivated agricultural field, a residential dwelling fronting St. David Street North and its related structures, and a small wetland in the southeast corner of the Site. The Site is bound by St. David Street North to the west and predominantly by agricultural lands to the north, east, and south. An existing residential subdivision is situated directly southeast of the southeastern corner of the Site. Figure 1 shows the location of the subject Site in the Town of Fergus.

It is understood that the Site is to be fully municipally serviced with the water and wastewater services and will include the construction of a 2.41± ha sized stormwater management (SWM) facility within the southwest corner of the Site, and a roadway network throughout the subdivision, connecting it to St. David Street North, within the west portion of the site. This investigation characterizes the hydrogeological setting and assesses potential impacts from future servicing. Other characteristics of the future development are to include a 0.81± ha sized park (Block 25) and a 3.34± ha sized environmental feature and buffer. The existing wetland will be maintained as part of this environmental feature post-development.

The overall objectives of the hydrogeological investigation are as follows:

1. To characterize the hydrogeologic setting, using data from the current and previous investigations, with primary emphasis on the near surface hydrogeologic setting.
2. To assess the roles (or functions) that groundwater and surface water have with respect to the wetland and other environmental features at or adjacent to the property.
3. To identify and evaluate potential impacts and opportunities to enhance groundwater and surface water contribution to receptors from the proposed development, and to make recommendations to safeguard these features from the potential impacts associated with the development.



As this is a preliminary report, early in the investigation process, the objectives above cannot be fully addressed at this time. An updated report will be provided after the completion of the investigative scope of work.

2.0 INVESTIGATION SCOPE

2.1 BACKGROUND DATA REVIEW

The following background information (Section 8.0 lists the specific information), which has been considered and reviewed as part of this investigation:

- CVD Engineering Ltd.; Preliminary Geotechnical Investigation (May 28, 2024)
- Golder; Hydrogeological Investigation, 8243 and 8282 Wellington Road 19, Ontario (February 2022)
- Grounded Engineering; Hydrogeological Assessment, 350 Wellington Road 7, Elora, Ontario (October 2022)
- Government of Canada Environment and Natural Resources; Historical Data; Fergus Shand Dam Weather Station; 2024 Daily Data Reports
- Grand River Conservation Authority; ESRI; ArcGIS; Map Your Property Tool (2024)
- Karrow, P.F.; Pleistocene Geology of the Guelph Area, Southern Ontario; Geological Report 61; Map 22153, scale 1:63,360 (1968) (Figure 2)
- Matrix Solutions Inc.; Centre Wellington Scoped Tier Three Water Budget Assessment (December 2017)
- Polocorp; Draft Plan of Subdivision (December 10, 2024) (Appendix A)
- MECP Water Well Records near Site (Appendix G)
- Toporama Topographical Map (Ministry of Natural Resources, Retrieved June 11, 2024) (Figure 1)
- WSP Canada Inc.; Hydrogeological Investigation - Updated, 8243 and 8282 Wellington Road 19, Ontario (April 2023)

2.2 BOREHOLE DRILLING & MONITORING WELL INSTALLATION

As part of both the initial hydrogeological and preliminary geotechnical investigations completed between January 15 and 17, 2024, five (5) boreholes were advanced to depths of between 5.20 and 8.25 m below existing grade, and monitoring wells were installed at each borehole location (labelled BH 4 to 8). A supplemental investigation was completed, between September 9 and 12, 2024, in which eight (8) additional boreholes/monitoring wells (labelled BH 106 to 113) were drilled and installed to a depth of 6.55 m below grade. These boreholes/wells were drilled/installed to investigate the shallow subsoil and shallow groundwater table conditions at the property.

The investigation was completed using a track-mounted CME-55 drill rig, equipped with standard 83 mm inner diameter hollow stem augers (HSA) operated by Davis Drilling Ltd. of Milton, Ontario. Soil samples collected during the borehole investigation program were examined in the field and subsequently



brought to CVD's laboratory for tactile and textural examination. Moisture content determinations were performed on all retrieved soil samples from the drilling program.

The ground surface elevation of the boreholes, monitoring wells, and geomorphological features of the site were surveyed by CVD for the purpose of this report using a Network RTK Global Navigation Satellite System (GNSS) Receiver. The survey data was collected using the UTM Zone 17N Projection, NAD83(CSRS)v7-2010 datum and Canada Geoid Model HT2_2010v70 (CGVD28).

2.3 DRIVE-POINT PIEZOMETER INSTALLATION

Shallow drive-point piezometers (DP) were installed at three (3) wetland/water course locations (DP1 to DP 3D, Figure 4) on November 10, 2023, and an additional (1) shallow piezometer (DP 3S) was installed on March 11, 2024, beside DP 3D. Furthermore, four (4) additional piezometers (DP 4S/4D and DP 5S/5D) were installed in other areas of the wetland as part of the September 2024 supplemental investigation. The piezometers were installed to investigate both groundwater and surface water levels (i.e., both inside and outside the piezometers) to characterize the groundwater-dependent features for the Grand River Conservation Authority (GRCA) regulated wetland, located within the southeast section of the Site. DP 1 was installed in the southern corner of the wetland at the edge of a pond connected to a stream travelling in a southern direction. DP 2 was installed roughly in the western central edge of the wetland, amongst cattails and other marsh-related vegetation, in what is likely an intermittent stream. DP 3S/3D were installed near the northwest edge of the wetland, in an area with no standing water. DP 4S/4D and DP 5S/5D were installed in the central area of the wetland – DP 4S/4D was installed in standing water (September) while the area surrounding DP 5S/D contained marsh-like vegetation but no standing water. According to the Grand River Conservation Authority (GRCA), the wetland in which DP 1, 2, 4S/D, and 5S/D are located is what is considered as a marsh, while the wetland beside DP 3S/3D is classified as a swamp. Figure 4 shows the locations of the drive-point piezometers within the wetlands and water courses.

The procedure for installing each drive-point piezometer was as follows: 1) auger a 0.85 m hole through the upper soil layers to observe the stratigraphy and groundwater conditions of the location 2) attach a 0.30-m long, 1.9-cm diameter stainless steel piezometer tip (or screen) to a length of 1.9-cm threaded steel riser pipe, 3) drive the assembled piezometer from ground surface to the depth desired using a post hammer, and 4) fill any annular space around the pipe with bentonite to prevent surface water from moving directly along the annulus to the piezometer screen.

2.3 WELL DEVELOPMENT, WATER LEVEL MONITORING, & RESPONSE TESTS

Each monitoring well was developed using Waterra™ polyethylene tubing and foot-valve hand pumps. As of the writing of this report, groundwater level monitoring was performed on five (5) occasions: on February 6, March 11, July 22, September 12, and September 18, 2024. Groundwater levels were obtained at all of the monitoring wells and piezometer locations during each occasion. Table 1 provides a summary of the groundwater levels and calculated elevations for the five monitoring events. Four (4) water level measurements were recorded from the drive point mini piezometers; DP 1 to DP 3D starting



in November 2023; however, the results have not yet been completed and will be included in future revisions of the report once more data is collected.

Well response tests (slug/bail tests) were completed at three (3) of the monitoring well locations (Boreholes 5 to 7) on March 11, 2024, to provide a more accurate estimate of the hydraulic conductivity (K) (or permeability) of the saturated aquifer subsoil strata, to assist in providing more accurate infiltration rates. The hydraulic conductivities were calculated through the Aquifer Test software utilizing the Bouwer and Rice method. The results of the tests are graphically presented in Appendix C, and a summary of the data is also included in Table 1.

Furthermore, five (5) grain size distribution analyses were carried out on representative subsoil samples to help identify and assist in providing estimates of hydraulic conductivities for the encountered groundwater-bearing subsoil deposits. The results of these tests are presented in Enclosures 22 and 28.

Additionally, to provide a more comprehensive summary of groundwater conditions at the Site, six (6) Van Essen DI801 10 m TD-Diver automated data loggers and one (1) Baro-Diver were installed in wells BH 5, 7, 101, 106, 111, and 113. Furthermore, two (2) DI601 10 m Micro-Divers were installed in DP 1 and DP 3D. The automated monitoring at these wells/piezometers using the dataloggers is currently ongoing.

3.0 SITE CHARACTERIZATION

3.1 TOPOGRAPHY, DRAINAGE & WETLAND FEATURES

The Site is within the Upper Grand River watershed and is fully encompassed within the West Montrose – Grand River subwatershed. Locally, the groundwater table and any surface water runoff traverses across the site in a generally north to south orientation, towards the southwestern corner of the property and towards the wetland, located within the southeastern corner/side of the Site.

According to the Grand River Conservation Authority (GRCA), the wetland within the southeastern corner of the Site is GRCA regulated and is split into two categories: marsh and swamp. Roughly the northern third of the wetland and a small section of the southeastern side of the area are designated as a swamp wetland, while the remainder of the wetland is designated as a marsh. The wetland extends past the southern confines of the Site and includes multiple ponds connected by perennial streams. Occasional intermittent streams can be observed travelling along the north-south axis across the wetland, towards the southern streams/ponds. Various trees, frequent cattails, and other marsh-related vegetation are present throughout most of the wetland. The GRCA mapping for the regulated lands abreast of the wetlands and water courses are shown on Figure 3.

Regionally, the surface topography decreases significantly towards Guelph and Kitchener/Waterloo, and generally increases north, towards The Grand Valley and Arthur. Elevations also decrease westward, towards Listowel, and significantly decrease eastward, towards Brampton. Currently, the topography in the area is formed from the most recent glacial activity (Wisconsin). The area around Fergus is full of



kames associated with the Orangeville Moraine (Karrow, 1968). Figure 1 shows the topographic contours across the site.

Local Site topography is considered 'rolling land', with ground elevations from north to south across the site ranging from 427± to 420± mASL. There is also generally a slight increase in surface elevation from east to west, across the Site. The current terrain on-Site is relatively even, with no major undulations, or topographical features. In general, runoff will mimic topography flowing to low elevations where water courses and wetlands are present. As a result, surface runoff from the farm fields is anticipated to be primarily controlled by topography and to drain towards the relatively lower lying south/wetland portion the property.

Excluding the wetland, most of the Site consists of a farm field with occasional minor residential/grassy areas fronting St. David Street North.

3.2 GEOLOGIC SETTING

Surface geological mapping for the area (by Karrow P.F., 1968) is presented in the Quaternary Geology map of Figure 2. According to Karrow (1968), the the Site is primarily underlain by lacustrine, kame deposits, comprising mainly outwash sands, with an underlying Wentworth till unit. Both deposits were laid down during the late Wisconsinan stage of the Pleistocene period. The local topography of the area has been largely influenced by the presence of The Wentworth Till. The entire area is underlain by dolostone bedrock of the Guelph Formation. This is confirmed through the MECP well record data for drinking water wells in the area surrounding the property, as included in Appendix G. According to the records, bedrock was encountered at depths between 24± and 32± m below existing grade (mbeg). Bedrock outcrops can be found in certain areas around Fergus and are notably present towards the southwest within the Elora Gorge.

The monitoring well-recorded data and borehole log data (Enclosures 4 to 8 and 14 to 21) collected during the Site investigation are generally consistent with Quaternary geological mapping. Based on the drilled boreholes, the surficial and subsoils encountered generally consisted of topsoil underlain by a 0.5 to 1.5 m thick layer of sandy silt to silty sand, in turn underlain by a major layer of fine sand with trace to some silt. North of the Site, fine sand deposits can extend deeper than 9.60 mbeg but only extend to 1.85 mbeg beneath the south portion (BH 7). Boreholes 109 to 113 contained only minor sand seams. The subsoil here is predominantly composed of sandy silt to silty sand and/or silt, underlain by a clayey silt till/sandy silt till deposit. Similarly, a clayey silt till with some sand content, ranging from trace sand to sandy was encountered in Boreholes 6 to 8, underlying the sand deposit. Based on the findings from the subsurface investigation, it appears that the contact depth of the clayey silt till/sandy silt till layer increases in elevation towards the south part of the property. This geological unit is probably the Wentworth Till deposit, referred to in Karrow (1968); however, it should be noted that the deposit was not encountered during this investigation anywhere in the north portion of the Site as was depicted in the geological maps. Occasional silt layers were also encountered interlayered with the clayey silt till.



3.3 HYDROGEOLOGIC SETTING

3.3.1 Water Table Depth and Configuration

The water table exists predominantly within the shallow fine to granular deposits (fine sand, sandy silt to silty sand, and silt subsoils) encountered beneath the entire Site. The encountered depth of the groundwater table greatly reduces from north to south across the property. Table 1 summarizes the groundwater level measurements collected thus far during this investigation from the period extending from February 2024 to September 2024 at all of monitoring well locations.

Figure 5 presents an interpretation of the water table configuration and shallow groundwater flow directions across the property using the groundwater elevation measurements gathered on September 18, 2024. As expected, the water table mimics the topography with shallow groundwater flowing southerly towards the southeastern portion of the Site in the direction of the wetland. Additionally, groundwater appears to also flow into the existing drainage feature located within the southwestern corner of the Site.

During the monitoring period, according to the gathered data, groundwater levels were encountered at depths ranging between 2.02 (BH 5) and 0.52 mbeg (BH 8), corresponding to elevations ranging between 423.59 and 420.50 masl according to the July 22, 2024, water levels measurements. It should be noted that these high-water levels documented during the summer season are likely caused by the abnormally high amount of precipitation experienced throughout the first half of 2024. Furthermore, groundwater level monitoring is required to understand the seasonal and yearly variability in groundwater elevations across the Site. Ongoing groundwater monitoring is being conducted on a seasonal basis to provide an evaluation of the seasonal variability of the groundwater table and its fluctuations. Appendix D includes a summary table of measured groundwater levels (Table 1) and interpreted hydrographs collected during the monitoring period. The hydrographs were plotted against monthly precipitation data sourced from the Government of Canada Environment and Natural Resources Daily Data Reports for the Fergus Shand Dam weather station, the nearest active weather station to the Site.

3.3.2 Groundwater Infiltration and Recharge

Groundwater infiltration rates are expected to vary across the Site; however, due to the general predominance of shallow fine grained sand deposits throughout the entire Site, infiltration rates are expected to be generally fast. Infiltration and recharge areas are also heavily influenced by the topographical features of the land, which in this case promotes shallow groundwater to flow towards the south.

Based on the single well response tests and physical examination of the soil deposits, the correlating estimated infiltration rates for the various surficial soils at the property range as follows:

- Fine to Medium Sand: 75 to 150 mm/hr
- Silty Sand: 15 to 30 mm/hr



- Sandy Silt to Sand and Silt: 10 to 20 mm/hr
- Silt: 3 to 5 mm/hr
- Clayey Silt Till: <1 mm/hr

According to data layers provided from the GRCA-Web GIS application, the property has a recharge rate of $320\pm$ to $370\pm$ mm/year. Recharge/infiltration should be high due to the ubiquitous presence of the fine sand deposit and its overall 'dry' condition, especially within the northern section of the Site where the water table during the peak groundwater elevation period (February to March 2024) was encountered at depths of between $2\pm$ to $3\pm$ mbeg.

During the period of higher groundwater elevations, expected during the spring and fall, infiltration is expected to be reduced in the wetland; however, considering the intermittent nature of the streams and surface water features in the marsh section of the wetland, infiltration will likely increase during the summer and fall seasons as the water table lowers. A large portion of the wetland is interpreted to promote groundwater recharge, as will be further discussed in the next section.

3.3.3 Groundwater / Surface Water / Wetland Interaction

The interactions occurring in the wetland area were examined based on both field observations and surface water/groundwater level data gathered at the five (5) mini-piezometer locations: DP1, DP2, DP3S/3D, DP 4S/4D, and DP 5S/5D (Figure 4). It is interpreted that a large portion of the wetland located on the estate is largely intermittent in nature, with more perennial surface water features located south of the property.

DP 1, which is located within a pond on the southwestern edge of the wetland, has continually exhibited a noticeable positive vertical hydraulic gradient (VHG) since installation, evidence that this is primarily a groundwater discharge area. Based on the current collected data and field observations, the surface water features in this area are some of the only perennial groundwater features found on the property and they are connected to the larger streams and ponds found south of the Site. Aside from groundwater discharge to maintain the wetland, surface water runoff also aids in maintaining these features since they are located in the relatively lowest section of the property in an area where there are fewer sand deposits, and higher amounts of clayey silt/sandy silt till deposits, and an overall higher groundwater table, all of which reduces potential infiltration of surface water and helps drive runoff towards the wetland.

The data collected at DP 2 shows a variable nature, switching from a clearly negative VHG from November to December 2023, indicating groundwater recharge, to a neutral VHG from February to July 2024. This is likely symptomatic of the conjectured intermittent nature of the marsh surface water features.

The preliminary groundwater data collected during September 2024 from both DP 4S/4D and DP 5S/5D show a clearly negative (recharging) VHG; however, it is predicted that the groundwater within these piezometers will also show intermittent behavior. More data is required to provide firm conclusions.



So far, not enough data has been collected at DP 3S/3D to provide an adequate evaluation of the conditions existing in that section of the eastern wetland. An initial comparison of the groundwater elevations (September 2024) with the mini piezometers to the groundwater elevations collected in the nearby well BH 107, potentially suggests a neutral VGH at the time of measurement. More data is required to provide firm conclusions.

3.4 SOURCE WATER PROTECTION AND GROUNDWATER USE

The entire Site is located within the Fergus Wellhead Protection Area (WHPA). Fergus currently has six (6) municipal supply wells (wells F1, F2, F4, F5, F6, F7), with the Site located in between three of these wells (F4, F6, F7). According to data provided on the GRCA-Web GIS application, most of the property is classified as WHPA-C, denoting an area in which travel time is between 2 to 5 years, and with a vulnerability score of 6. The entire eastern boundary of the Site falls within WHPA-B for the municipal well, F6, denoting an area in which the groundwater travel time to the well is 2 years or less, and having a vulnerability score of 8. Both sections are considered to have a medium vulnerability. It should also be noted that the Belwood Reservoir, where the lake levels are controlled by the Fergus Shand Dam, is located along the Grand River, upstream of Fergus.

All six (6) of the existing municipal supply wells pump groundwater from the dolostone bedrock aquifers of the Guelph, Gasport, and Goat Island Formations. They are both primarily cased and open in the Guelph Formation dolostone. One of these six wells (F2), which is now inactive, is a well with groundwater under the direct influence of surface water (GUDI). Transmissivity values of the Fergus wells range between 52 to 395 m²/day (Matrix Solutions Inc., 2017). The wells were drilled to depths of between 76.5 mbeg (F2) and 138.7 mbeg (F7).

Regarding the water quality at the Site, three (3) groundwater samples were submitted from monitoring wells at BH 5, 6, and 7 for analysis of general chemistry, nutrients, and metals. These samples were submitted to the AGAT Laboratories of Mississauga for testing/analysis, with results being provided in Appendix F. No major concerns were identified. Elevated levels of iron were present which exceed the aesthetic drinking water objectives; however, this is naturally occurring within the shallow groundwater of the area. Minor amounts of cadmium, cobalt, copper, vanadium, and zinc were also detected. Slightly elevated amounts of sulphate were also detected in the monitoring wells BH 5 and 7, and slightly higher amounts of nitrate were detected in BH 6, likely caused by on-going agricultural activity. Nitrate and nitrite levels measured at BH 7, in the proposed area for the SWM facility, met Ontario Drinking Water Standard criteria. No chemical threats to groundwater at the Site were detected.

4.0 WATER BUDGET ASSESSMENT

Pre-Development Water Balance

Precipitation ultimately becomes split into three 'water budget' components: evapotranspiration, runoff, and recharge, with the latter two often referred to together as 'the water balance' (i.e., the remainder after evapotranspiration is removed). Groundwater recharge rates will vary at a given site



based on the permeability of the surficial deposits but will also depend on topography and type of vegetative cover. Most of the subject property has been historically agricultural and has had different types of crops depending on the year, with no crop planted at all during certain portions of the year. During fall to summer 2024, winter wheat was being grown.

A pre-development water balance for the property has been estimated using the Water Balance Method (WBM) of Thornthwaite and Mather (1957), a method cited in the MECP document “Stormwater Management Planning and Design Manual” (March 2003) to estimate evapotranspiration. The calculations utilize the 1981-2010 ‘Climate Normals’ from the closest weather station located at the Fergus Shand Dam (gives an annual precipitation rate of 946 mm/yr) and considers a combination of cultivated land use with moderately deep-rooted crops (e.g. wheat), pasture & lawns, wetland, and impervious surfaces. Using these conditions, the subject site has an average evapotranspiration rate of about 56.5% (or 536 mm/yr) and remaining ‘water balance’ of about 43.5% (410 mm/yr) is estimated. The 2003 MECP document also provides a methodology for estimating the proportions of the water balance that ultimately become runoff vs. recharge, based on applicable infiltration factors for soil, vegetative cover, and topography.

The overall water balance and water budget calculations are included in Appendix E. In summary, the pre-development average annual water budget for the 19.39± ha property is as follows:

A) Pervious Cultivated Land of 14.35 ha

Precipitation	946 mm/yr	135,737 m ³ /yr
Evapotranspiration	536 mm/yr	76,876 m ³ /yr
Water Balance	410 mm/yr	58,861 m ³ /yr
Recharge	287 mm/yr	41,202 m³/yr
Runoff	123 mm/yr	17,658 m ³ /yr

B) Pervious Pasture & Lawns of 1.50 ha

Precipitation	946 mm/yr	14,189 m ³ /yr
Evapotranspiration	536 mm/yr	8,036 m ³ /yr
Water Balance	410 mm/yr	6,153 m ³ /yr
Recharge	308 mm/yr	4,615 m³/yr
Runoff	103 mm/yr	1,538 m ³ /yr

C) Pervious Woodland & Wetland of 3.34 ha

Precipitation	946 mm/yr	31,593 m ³ /yr
Evapotranspiration	536 mm/yr	17,893 m ³ /yr
Water Balance	410 mm/yr	13,700 m ³ /yr
Recharge	328 mm/yr	10,960 m³/yr
Runoff	82 mm/yr	2,740 m ³ /yr



D) Impervious Rooftops to Pervious Areas of 0.20 ha

Precipitation	946 mm/yr	1,892 m ³ /yr
Evapotranspiration	95 mm/yr	189 m ³ /yr
Water Balance	851 mm/yr	1,703 m ³ /yr
Recharge	213 mm/yr	426 m³/yr
Runoff	638 mm/yr	1,277 m ³ /yr

Assuming that the wetland area is to remain undeveloped, the target recharge quantity for matching in post-development is 46,243 m³/yr. Recharge can likely be met through a stormwater management design utilizing enhanced infiltration facilities as Low Impact Development (LID) infrastructure for the developed site.

5.0 SITE SERVICING REQUIREMENTS & IMPACT ASSESSMENT

5.1 WASTEWATER SYSTEMS & POTENTIAL IMPACT OF EFFLUENT

The proposed subdivision will be connected to municipal sanitary sewers. No private wastewater treatment system requirements are anticipated for the proposed subdivision.

5.2 WATER SUPPLY & POTENTIAL IMPACT OF WATER TAKING

The proposed subdivision will be serviced by municipal water services. No private water supply service requirements are anticipated.

5.3 STORMWATER MANAGEMENT & POTENTIAL IMPACT TO GROUNDWATER RECHARGE

The proposed subdivision will be serviced by municipal stormwater management works; however, at the time of the writing of this report, aside from an overall concept, no specific design drawings/plans were available. As the realization of the project proceeds, addendums addressing stormwater management and any theoretical impacts to groundwater recharge including proposed LID infrastructure at the Site may be provided during the detailed design stage.

It is understood that a 2.41± ha SWM facility is to be constructed in the southwestern area of the Site. The general shallow groundwater gradient travels towards the proposed location of the SWM facility. The fine sand deposits generally thin out while simultaneously, the clayey silt till deposits rise in elevation towards the south of the property. Groundwater levels in the area ranged from the depths of 0.2± to 0.5± mbeq (elevations 420.6± to 421.4± mASL) during the winter to spring 2023-2024, corresponding to the high-water table. Since it is recommended that the base of any infiltration facilities be situated no less than 1 m above the seasonally high-water table to ensure reliable infiltration functionality, the SWM facility will likely have to be raised or redesigned in a way to avoid the



near-surface shallow groundwater table.

Further groundwater monitoring is being performed to better understand the water table and its seasonal variations to support development design.

Due to the abundance of ‘dry’ and highly permeable sands throughout much of the Site, infiltration galleries, open ditches and/or swales, and or soak away pits can be constructed into the sandy soils to maintain pre-development recharge rates. Further recommendations may be provided once a more detailed plan is available.

It is important to ensure that the adjacent regulated wetland east of the proposed SWM facility is not negatively impacted following development. The current conceptual plan (July 2024) proposes a 10 m buffer zone between the wetland and the remainder of the Site. During the design of the stormwater facilities, it is critical that water balance and quality of water are maintained throughout the property, and any potential effects associated with erosion and sedimentation control to the topographical /environmental features are properly designed and controlled.

The Stormwater Management Planning and Design Manual (March 2003) provided by the Ministry of Environment may be used as a reference to the planning of the stormwater systems. Additionally, the Township of Centre Wellington Sewer Use By-Law No. 2022-66 should be consulted.

6.0 CONCLUSIONS & RECOMMENDATIONS

Based on the results of the hydrogeological investigation described in this report, the following conclusions and recommendations are provided.

1. The subject property is predominantly underlain by fine sand deposits of the late Wisconsin stage of the Pleistocene period, which reduces in thickness from north to south across the property. A clayey silt till/sandy silt till deposit, likely the Wentworth Till, underlies the fine granular deposits and generally increases in contact elevation to the south. During the spring to early summer 2024 period, the groundwater table depth depths ranged between 0.25 (BH 8) and 2.10 mbeg (BH 5) across the property, corresponding to elevations between 423.62 (BH 5) and 420.76 (BH 8) masl.
2. Topography decreases in elevation from north to south with ground surface elevations approximately ranging from between 427± to 420± mASL. Shallow groundwater generally mimics the topography of the Site and flows towards the southwestern corner of the property and towards the southeastern wetland.
3. Due to the predominance of the underlying fine sand deposits with a high infiltration rate (100 mm/hr), and the relatively deeper lying groundwater table beneath the north section of the site (2± to 3± mbeg, March 2024), infiltration/recharge opportunities throughout the Site should be abundant. Based on the calculated pre-development water balance, the Site has an average evapotranspiration rate of about 56.5% (or 536 mm/yr) and a remaining ‘water balance’ of about



43.5% (410 mm/yr) is estimated. Assuming that the wetland area is to remain undeveloped, the target recharge quantity for matching in post-development is 46,243 m³/yr.

4. The wetland area is split into two categories: swamp and marsh. Currently, the available data suggests that much of the wetland area is considered to have intermittent surface water features which are primary involved in groundwater recharge and infiltration. However, perennial swamps and streams do exist within the southern portion of the wetland at the southwestern edge of the Site, where an upward vertical hydraulic gradient and an overall groundwater discharge condition has been observed.
5. The property falls within the Fergus Wellhead Protection Area (WHPA) and is currently classified as WHPA-C and WHPA-B with an overall medium vulnerability rating between 6 and 8. The property is located between three (3) of the six (6) Fergus municipal supply wells. No chemical threats or concerns were identified within the property bounds.
6. Site servicing (wastewater, water supply, stormwater management) for the development is to be fully municipally supplied. At the time of the writing of this report, aside from a general concept plan showing the location of the proposed SWM facility, no specific design drawings / plans were available. It is also recommended that as design plans are updated and information becomes available, addendums be added to address the specific site servicing issues. Furthermore, groundwater monitoring should be completed to aid in the design and location of the proposed SWM facility and any proposed LID, infiltration infrastructure.
7. Seasonal groundwater monitoring is incomplete and is ongoing at the Site to better characterize the hydrogeological setting and groundwater/surface water interactions.
8. It is recommended that once finished floor elevations and a site grading plan are available, that CVD be retained to review the final design and provide updates to the recommendations and conclusions provided in this report. Based on the final design, additional boreholes/monitoring wells might be required to delineate the extent of the water table and provide additional information.



7.0 CLOSING

This hydrogeological investigation report has been prepared for the exclusive use of the Client and their assigns for specific application to this project property.

The assessment was conducted in accordance with the verbal and written requests from the Client, and generally accepted assessment practices. Performance of this assessment is intended to reduce, but not eliminate, uncertainty regarding the hydrogeological conditions encountered at the project site, given reasonable limits of time and cost. No other warranty, expressed or implied, is made.

We trust this report is sufficient for your immediate requirements. If you have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
CHUNG & VANDER DOELEN ENGINEERING LTD.



Yaroslav Chudin, EIT
Geotechnical Engineering Intern



Gavin R. O'Brien M.Sc., P.Geo.
Senior Hydrogeologist



Peter Dao, M.Sc., P.Geo.
Manager, Environmental & Hydrogeology



8.0 REFERENCES

The following documents, maps, or other publications have been used in the preparation of this report.

- “Centre Wellington Scoped Tier Three Water Budget Assessment”, Matrix Solutions Inc. (December 2017).
- “Draft Plan of Subdivision”, Polocorp (December 10, 2024).
- “Historical Data; Fergus Shand Dam Weather Station; 2024 Daily Data Reports” Government of Canada Environment and Natural Resources; Retrieved October 1, 202
- “Preliminary Geotechnical Investigation: Proposed Residential Subdivision”, Project No.: 1495, CVD Engineering Ltd. (May 28, 2024)
- “Hydrogeological Assessment, 350 Wellington Road 7, Elora, Ontario”, Grounded Engineering (October 2022)
- “Hydrogeological Investigation, 8243 and 8282 Wellington Road 19, Ontario”, Golder (February 2022)
- “Hydrogeological Investigation - Updated, 8243 and 8282 Wellington Road 19, Ontario”, WSP Canada Inc. (April 2023)
- “Map Your Property Tool”, Grand River Conservation Authority; ESRI; ArcGIS (2024)
- “Pleistocene Geology of the Guelph Area, Southern Ontario; Geological Report 61”, Map 22153, scale 1:63,360, Karrow, P. F. (1968).
- Toporama Topographical Map, Ministry of Natural Resources (Retrieved June 11, 2024)



APPENDIX A

Conceptual Subdivision Plan (Polocorp, December 10, 2024)





KEY MAP - N.T.S.

DRAFT PLAN OF SUBDIVISION

PT OF LOT 17, CONCESSION 16
IN THE FORMER GEOGRAPHIC TWP OF NICHOL
CENTRE WELLINGTON

POLOCORP INC.

SCALE = 1:1400 (metric)

DESCRIPTION	LOTS/BLKS.	UNITS	AREA (ha.)
Single Detached	1-10	62-88	8.006
Street Townhouses	11-18	80-118	6.185
Medium Density	19, 20	71-102	1.617
Mixed Use	21	8-14	0.338
Existing House	22	-	0.330
Stormwater Management Facility	23	-	2.412
Trail	24	-	0.417
Parkland	25	-	0.806 (5.2%)
Pedestrian Walkway	26, 27	-	0.077
Environmental Feature & Buffer	28	-	3.340
MTO Allowance	29, 30	-	0.527
Roads	-	-	3.502
TOTAL	-	221-323	19.389

SALEABLE FRONTAGE	LENGTH	UNIT SMALL	UNIT LARGE
Single Detached	1,014.5m	36' (11.0m)	50' (15.2m)
Street Townhouses	530.0m	18' (5.5m)	27' (8.3m)
TOTAL	1,844.5m	-	-

DENSITY

Gross Area (ha)	19.389 ha (47.91 ac)
Developable Area (ha)	15.477 ha (38.25 ac)
Net Density (upha)	14.3 - 20.9 upha
Net People-Jobs (3.05 per unit)	43.6 - 63.8 PU pha

LEGEND

- Wetland Limit
- Wetland 30m Buffer

INFORMATION REQUIRED

UNDER SECTION 51 (17) OF THE PLANNING ACT, R.S.O. 1990, c.P.13 AS AMENDED

INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,g,j AND I ARE AS SHOWN ON THE DRAFT PLAN.

(h) Municipal Water Supply

(i) Sandy Loam

(k) Municipal Sanitary and Storm Sewers

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LANDS TO BE SUBDIVIDED ON THIS PLAN AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE ACCURATELY AND CORRECTLY SHOWN.

O.L.S. Surveying Inc. XX XX, 2024 DATE

OWNER'S CERTIFICATE

I HEREBY CONSENT TO THE FILING OF THIS PLAN BY POLOCORP INC., IN DRAFT FORM

MIKE PUOPOLO Polocorp Inc. DATE

APPROVALS

REGIONAL MUNICIPALITY OF WATERLOO APPROVAL BLOCK

DRAFT

FOR DISCUSSION PURPOSES ONLY

APPROVED: DATE:

REVISIONS		
DATE	BY	DESCRIPTION

POLOCORP

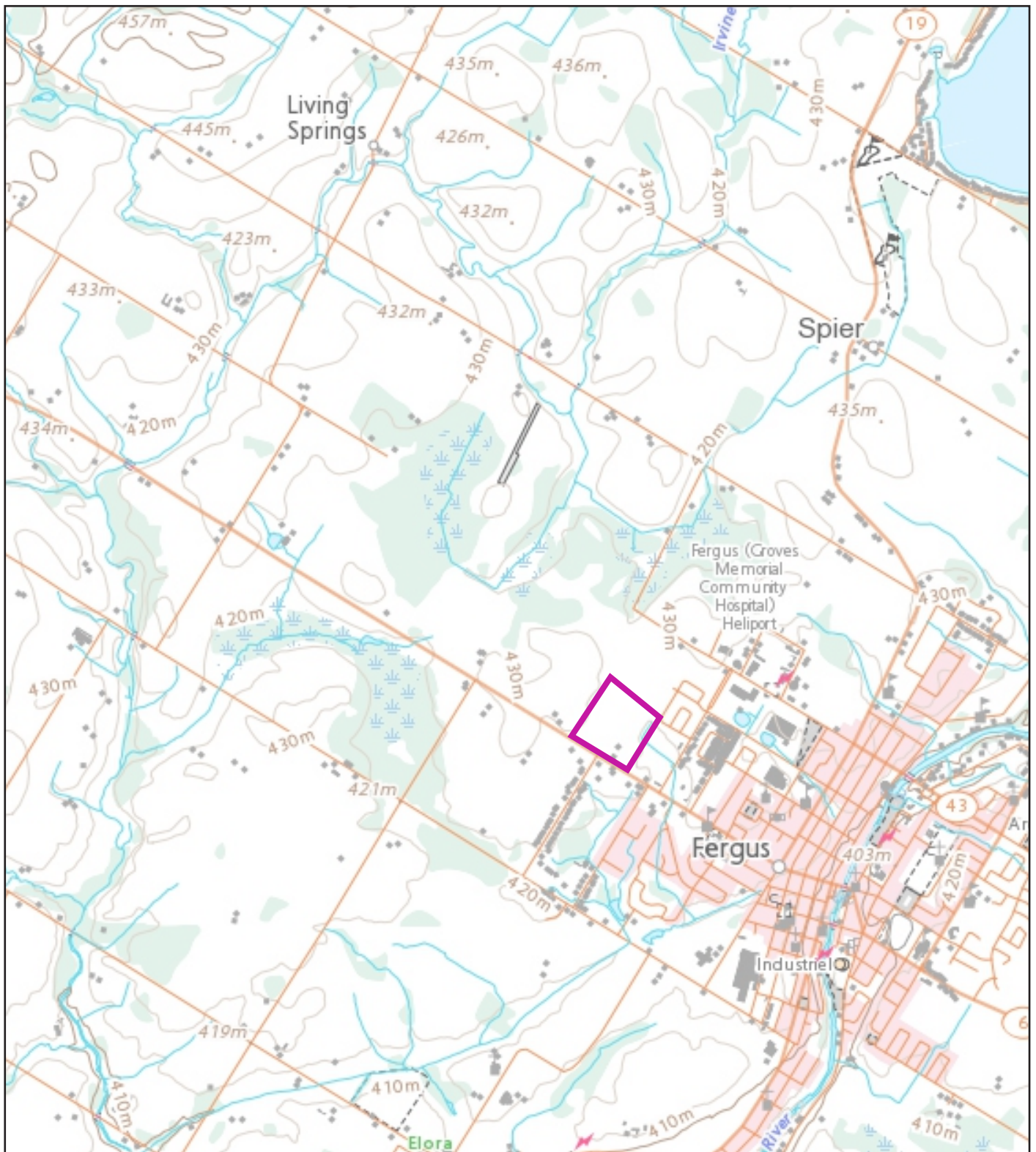
379 Queen Street South, Kitchener | N2T 1W6 | 519-745-3249 | polocorpinc.com

DATE: December 10, 2024	SCALE 1:4000 (metric)
PROJECT: 1012 (Fergus)	DRAWN BY: GFE

APPENDIX B

Figures 1 to 5





LEGEND



Subject Development Property



0 m 500 1000

Scale 1:40,000

Map Ref.: Toporama; Natural Resources Canada; GeoGratis;
Retrieved June 6, 2024

Figure 1 - Site Location

Hydrogeological Assessment

968 St. David Street North
Fergus, ON

Drawn By: YC

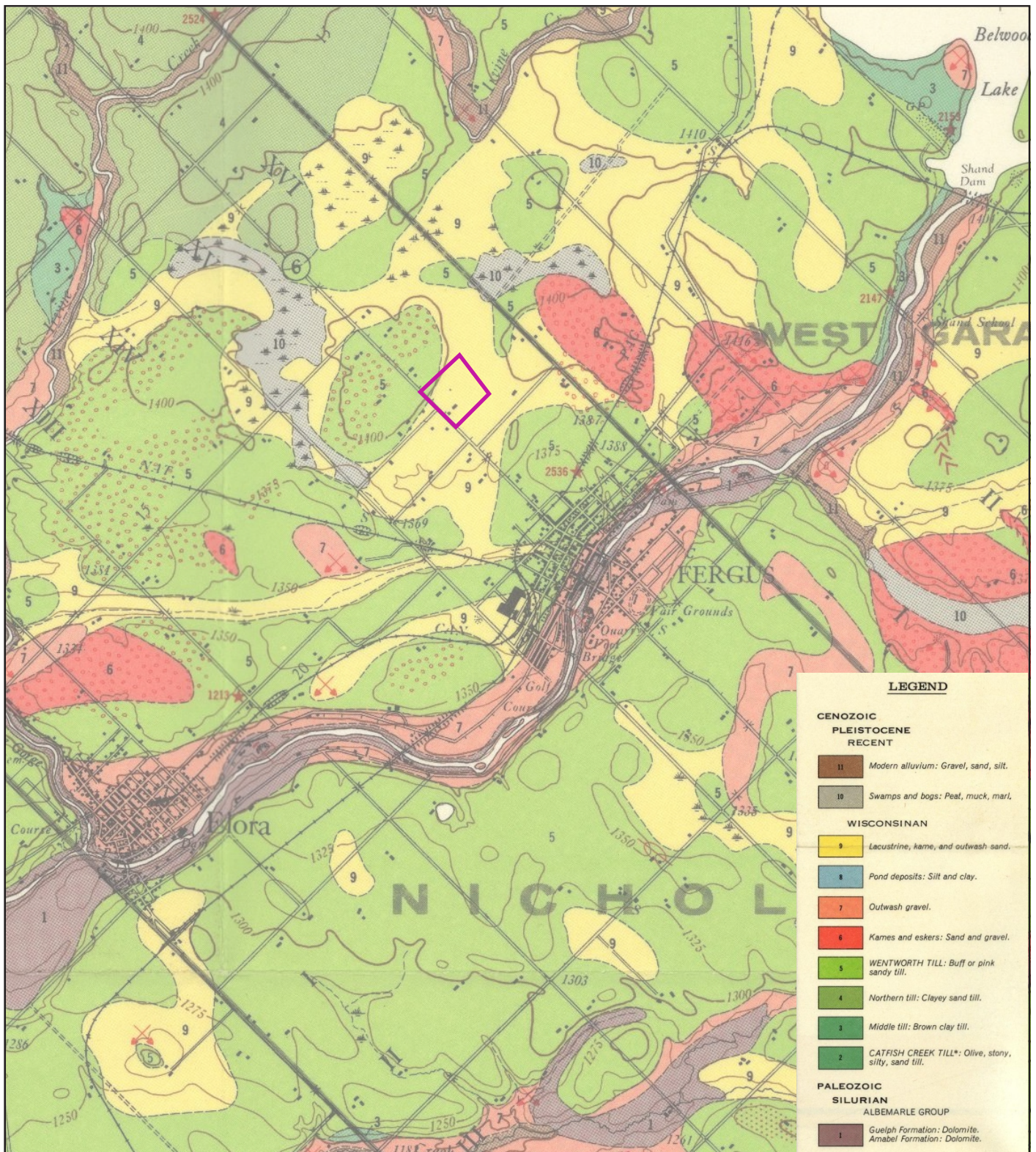
Date: Jan. 30/24

File No. 1495



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979



LEGEND



Subject Development Property



0 m 1000 2000
Scale 1:50,000

Map Ref.: Karrow, P.F.; Pleistocene Geology of the Guelph Area, Southern Ontario (Map 2153); 1968.

Figure 2 - Quaternary Geology

Hydrogeological Assessment

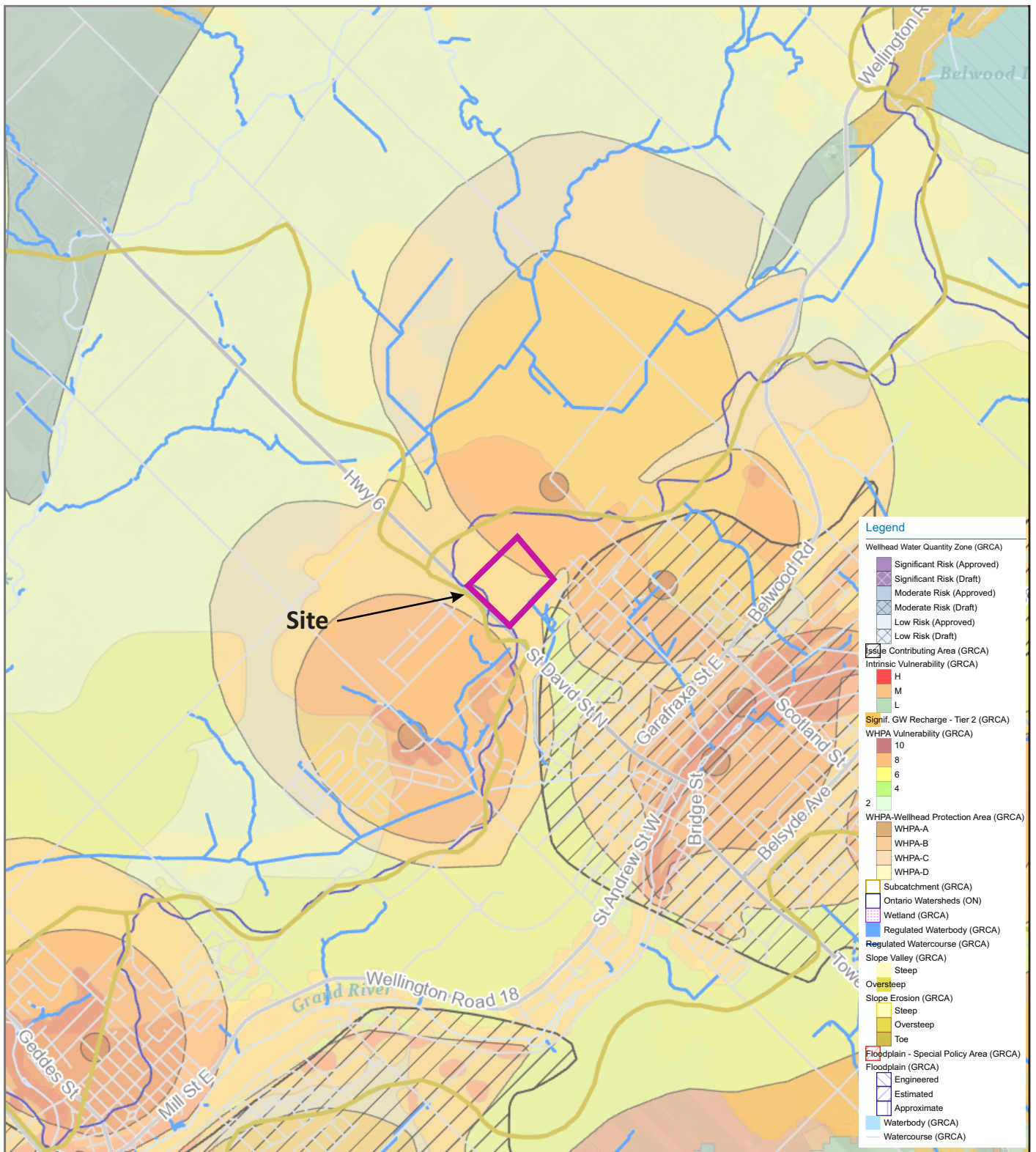
968 St. David Street North
Fergus, ON

Drawn By: YC Date: Sept. 30/24 File No. 1495



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979



LEGEND



Subject Development Property



0 m 500 1000

Scale 1:40,000

Map Ref.: Grand River Conservation Authority; GRCA Web-GIS; Retrieved September 30, 2024

Figure 3 - Watershed Mapping

Hydrogeological Assessment

968 St. David Street North
Fergus, ON

Drawn By: YC

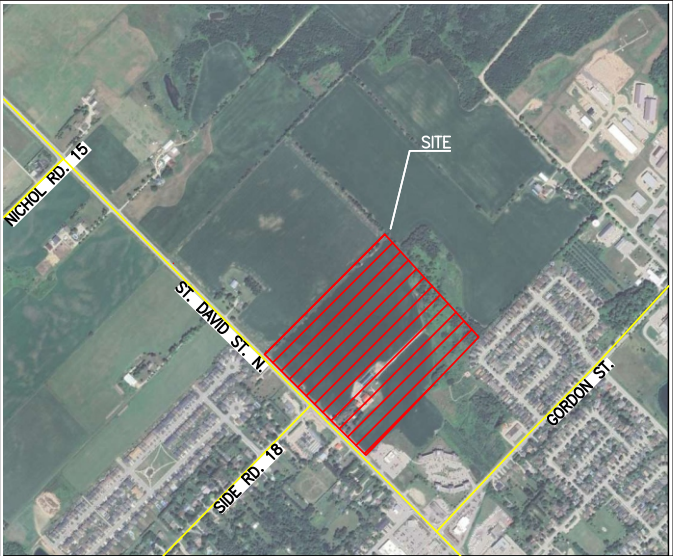
Date: January 30/24

File No. 1495



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979



LEGEND

- Property Boundary
- CVD Monitoring Well Location
- CVD Drive-Point Piezometer Location
- (422.93, 423.89) Ground Surface, Top of Well/Piezometer Pipe Elevation (m)

Scale 1:4000

Image Reference: Google Earth; Retrieved: May 1, 2024

Figure 4:
Monitoring Well and Piezometer Locations

Hydrogeological Assessment
Polocorp Fergus Subdivision - Phase 1

968 St. David Street North & 6581 Highway 6
Fergus, ON



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979



LEGEND

- Property Boundary
- CVD Monitoring Well Location
- CVD Drive-Point Piezometer Location
- Water Table Elevation (mASL) - September 18, 2024
- Interpreted Groundwater Contour (mASL)
- Interpreted Shallow Groundwater Flow Direction

0 50 100 m
Scale 1:4000

Image Reference: Google Earth; Retrieved: May 1, 2024

Figure 5:
Water Table Interpretation (September 18, 2024)

Hydrogeological Assessment
Polocorp Fergus Subdivision - Phase 1

968 St. David Street North & 6581 Highway 6
Fergus, ON

CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 VICTORIA STREET NORTH
KITCHENER / ONTARIO / N2H 2E1 / 519-742-8979

APPENDIX C

Well Response Test Analysis Charts





CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Response Test - Water Level Data and Analysis

Page 2 of 4

Project: Polocorp Fergus Subdivision

Number: 1495

Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON

Response Test: BH 5

Test Conducted by: Y.C.

Test Date: 2024-03-11

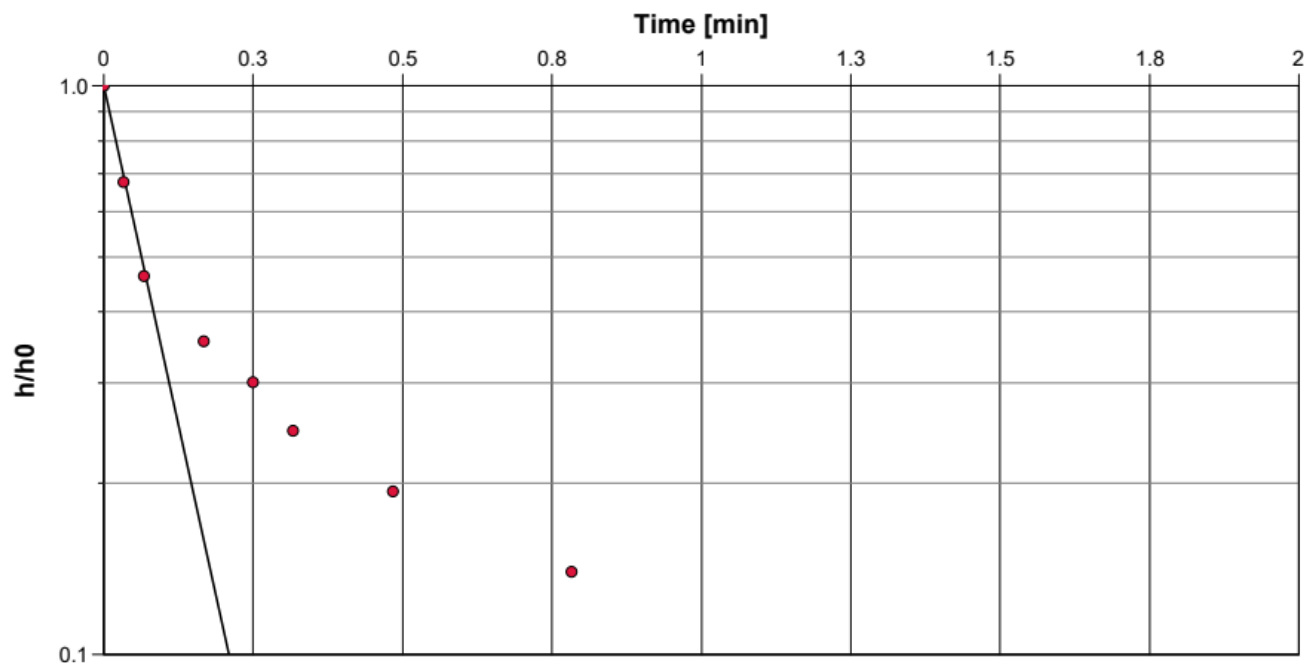
Aquifer Thickness: 6.20 m

Water level at t=0 [m]: 2.09

Static Water Level [m]: 1.99

Water level change at t=0 [m]: 0.09

	Time [min]	Water Level [m]	WL Change [m]
1	0	2.087	0.093
2	0.0333	2.057	0.063
3	0.0667	2.037	0.043
4	0.1667	2.027	0.033
5	0.25	2.022	0.028
6	0.3167	2.017	0.023
7	0.4833	2.012	0.018
8	0.7833	2.007	0.013
9	1.1167	2.002	0.008
10	1.55	2.00	0.006



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]
BH 5	8.69×10^{-5}



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Response Test - Water Level Data and Analysis

Page 3 of 4

Project: Polocorp Fergus Subdivision

Number: 1495

Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON

Response Test: BH 6

Test Conducted by: Y.C.

Test Date: 2024-03-11

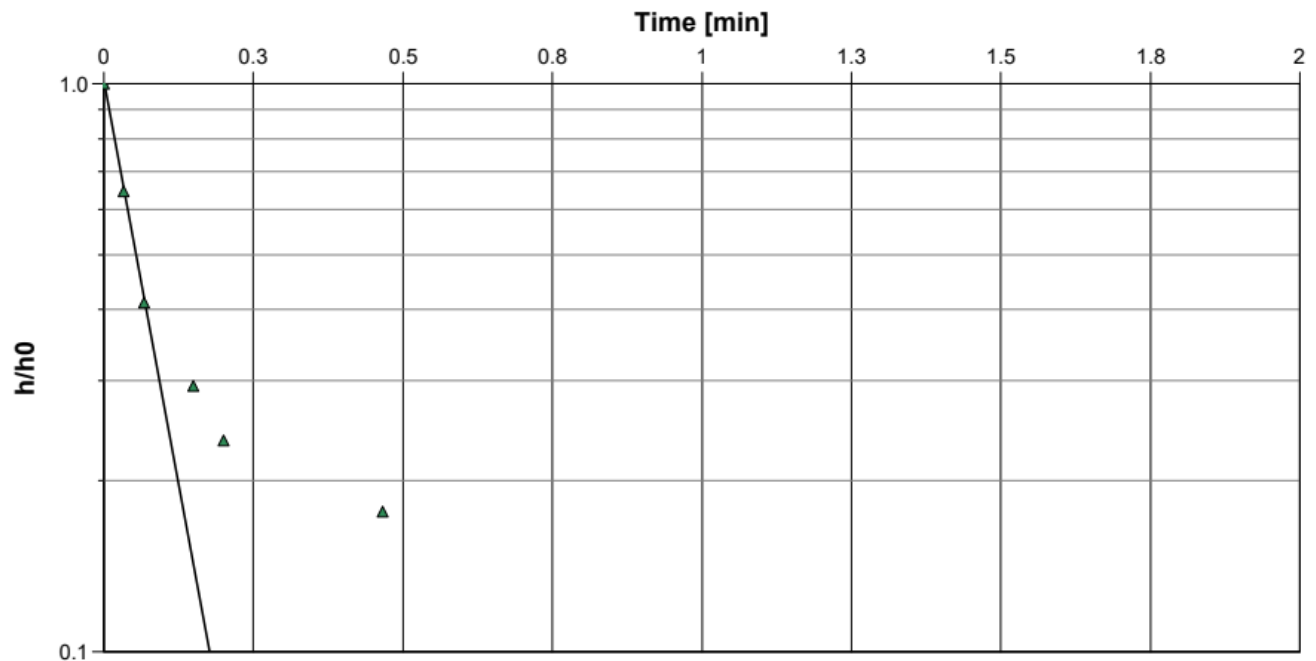
Aquifer Thickness: 3.10 m

Water level at t=0 [m]: 1.65

Static Water Level [m]: 1.56

Water level change at t=0 [m]: 0.08

	Time [min]	Water Level [m]	WL Change [m]
1	0	1.646	0.085
2	0.0333	1.616	0.055
3	0.0667	1.596	0.035
4	0.15	1.586	0.025
5	0.2	1.581	0.02
6	0.4667	1.576	0.015



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]
BH 6	8.91×10^{-5}



CHUNG & VANDER DOELEN
ENGINEERING LTD.

311 Victoria Street North
Kitchener / Ontario / N2H 5E1
519-742-8979

Response Test - Water Level Data and Analysis

Page 4 of 4

Project: Polocorp Fergus Subdivision

Number: 1495

Client: Polocorp Inc.

Location: 968 St. David Street North & 6581 Highway 6, Fergus, ON

Response Test: BH 7

Test Conducted by: Y.C.

Test Date: 2024-03-11

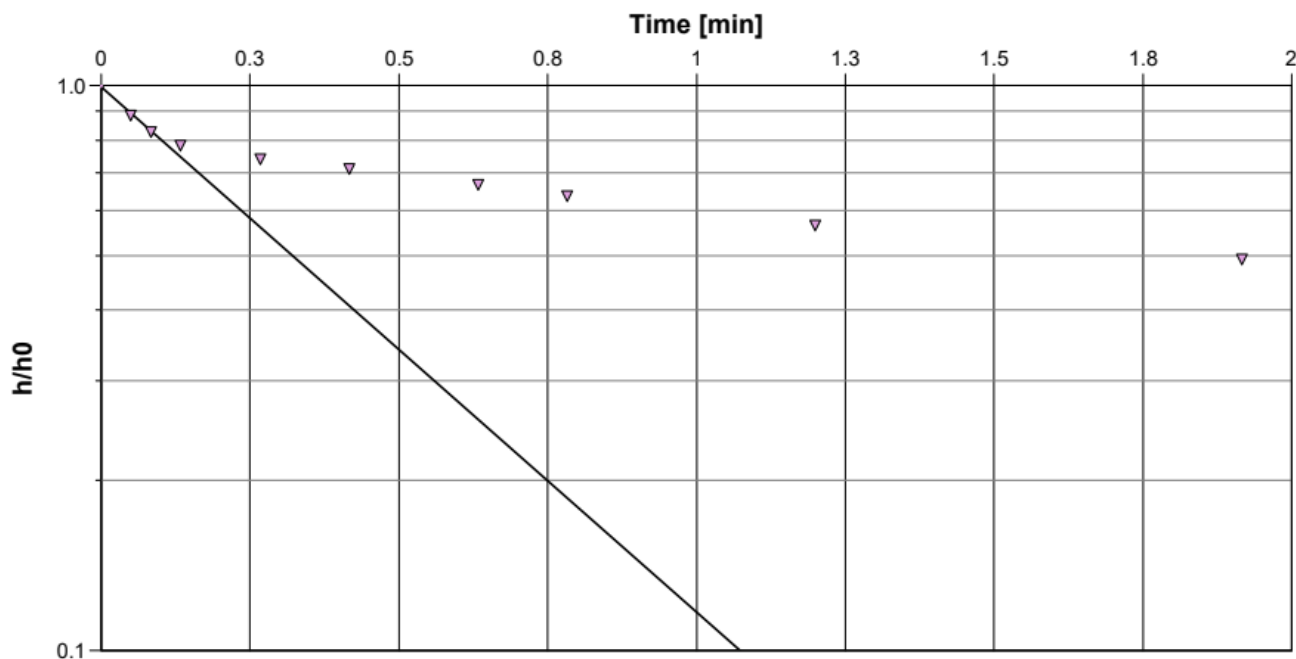
Aquifer Thickness: 1.50 m

Water level at t=0 [m]: 1.20

Static Water Level [m]: 0.51

Water level change at t=0 [m]: 0.69

	Time [min]	Water Level [m]	WL Change [m]
1	0	1.199	0.69
2	0.05	1.119	0.61
3	0.0833	1.079	0.57
4	0.1333	1.049	0.54
5	0.2667	1.019	0.51
6	0.4167	0.999	0.49
7	0.6333	0.969	0.46
8	0.7833	0.949	0.44
9	1.2	0.899	0.39
10	1.9167	0.849	0.34
11	2.6333	0.819	0.31
12	3.3833	0.799	0.29
13	3.9667	0.789	0.28
14	4.5167	0.779	0.27
15	5.1333	0.769	0.26



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [m/s]	
BH 7	2.81×10^{-5}	

APPENDIX D

Table 1 – Water Level Measurements & Hydrograph (February 2024 to September 2024)



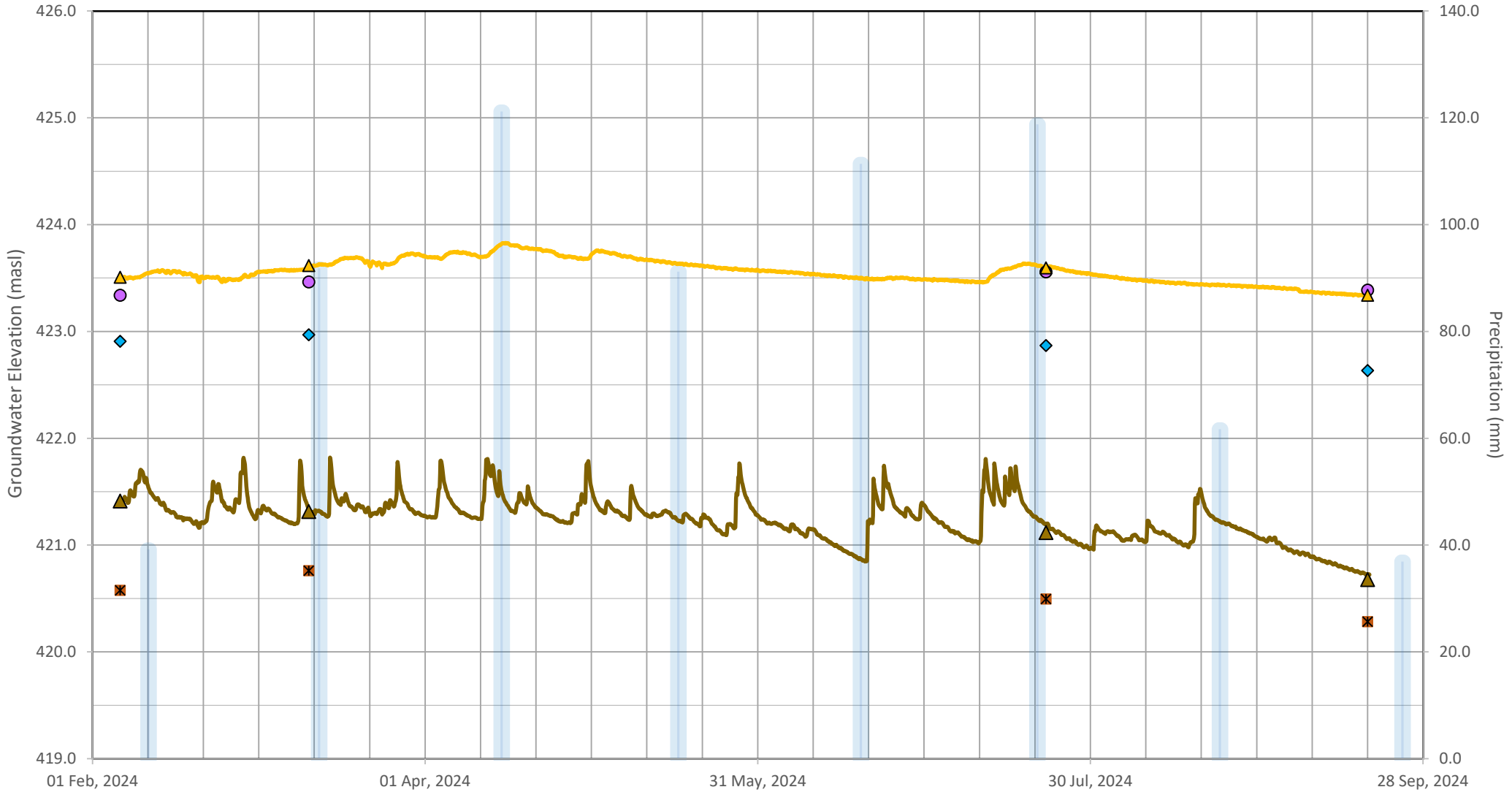
Table 1 - Summary of Water Levels, Elevations & Fluctuations

968 St. David Street North, Fergus
CVD Engineering Ltd.
Project: 1495

Well	Ground Elevation (mASL)	Top Pipe Elevation (mASL)	Pipe Length (m)	Hydraulic Conductivity (m/s)	Water Level (m Below Ground)							Water Elevation (m Above Sea Level)							Fluctuation Relative to February 6, 2024 (m)			
					10-Nov-23	12-Dec-23	06-Feb-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24	10-Nov-23	12-Dec-23	06-Feb-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24	11-Mar-24	22-Jul-24	12-Sep-24	18-Sep-24
BH 4	426.94	428.13	1.18	-			3.61	3.48	3.39		3.56			423.34	423.46	423.56		423.39	0.13	0.22		0.05
BH 5	425.61	426.87	1.26	9×10^{-5}			2.10	1.99	2.02		2.27			423.51	423.62	423.59		423.34	0.11	0.09		-0.17
BH 6	424.53	425.53	1.00	9×10^{-5}			1.62	1.56	1.66		1.90			422.91	422.97	422.87		422.63	0.06	-0.04		-0.27
BH 7	421.82	422.97	1.15	3×10^{-5}			0.41	0.51	0.71		1.14			421.41	421.31	421.12		420.68	-0.10	-0.30		-0.74
BH 8	421.01	422.12	1.11	-			0.44	0.25	0.52		0.73			420.58	420.76	420.50		420.28	0.18	-0.08		-0.29
BH 106	424.80	425.74	0.94	-						2.07	2.08						422.73	422.72				
BH 107	422.93	423.89	0.96	-						0.40	0.41						422.53	422.52				
BH 108	424.74	425.68	0.94	-						1.82	1.83						422.92	422.91				
BH 109	422.66	423.64	0.98	-						0.40	0.41						422.26	422.25				
BH 110	422.92	423.97	1.05	-						0.57	0.58						422.35	422.34				
BH 111	421.24	422.19	0.95	-						0.60	0.67						420.64	420.57				
BH 112	422.30	423.29	0.99	-						0.74	0.83						421.56	421.46				
BH 113	422.02	422.87	0.85	-						1.53	1.60						420.49	420.42				
DP 1 In	420.06	421.62	1.56	-	-0.33	-0.38	-0.34	-0.39	-0.36		-0.20	420.39	420.44	420.40	420.45	420.42		420.26				
DP 1 Out	420.06	421.62	1.56	-	-0.23	-0.20		-0.27	-0.23		-0.17	420.28	420.26		420.32	420.29		420.22				
DP 2 In	421.71	423.09	1.37	-	1.69	0.45	-0.01	-0.06	-0.06		0.10	420.02	421.26	421.73	421.77	421.78		421.61				
DP 2 Out	421.71	423.09	1.37	-	-0.08	-0.06		-0.08	-0.06			421.79	421.77		421.79	421.78						
DP 3S In	422.86	424.48	1.62	-					0.27		0.36					422.59		422.50				
DP 3S Out	422.86	424.48	1.62	-																		
DP 3D In	422.88	424.42	1.54	-	0.57	0.29	0.26	1.23	0.27		0.36	422.31	422.59	422.62		422.61		422.52				
DP 3D Out	422.88	424.42	1.54	-					-1.54							424.42						
DP 4S In	421.27	422.54	1.28	-						-0.15	-0.14						421.42	421.41				
DP 4S Out	421.27	422.54	1.28	-						-0.16	-0.16						421.43	421.43				
DP 4D In	421.29	422.71	1.42	-						1.28	1.05						420.01	420.24				
DP 4D Out	421.29	422.71	1.42	-						-0.11	-0.11						421.41	421.41				
DP 5S In	421.64	422.77	1.13	-						0.39							421.25					
DP 5S Out	421.64	422.77	1.13	-																		
DP 5D In	421.60	423.00	1.39	-						0.48	0.51						421.13	421.09				
DP 5D Out	421.60	423.00	1.39	-																		

- Notes:
- 1) All Elevations Referenced to Geodetic Survey by CVD.
 - 2) Bolded elevations represent the maximum water table aquifer elevation measured at each monitoring well throughout all seasons.
 - 3) Negative water level indicates that water level is above ground.
 - 4) : Monitoring well/piezometer dry
 - 5) Negative fluctuation indicates drop in water level relative to baseline.

1495 Hydrograph - 968 St. David Street North, Fergus (Phase 1) (February 2024 to September 2024)



Precipitation BH 4 BH 5 BH 6 BH 7 BH 8 BH 7 (Logger) BH 5 (Logger)

APPENDIX E

Water Balance Calculation



Pre-Development Water Budget Calculations - 968 St. David Street North, Fergus
Pervious Areas (Cultivated Land and Grassed Pasture, with Trees and Shubs)

January 2025

Determination of Evapotranspiration and Water Balance Components - by Water Balance Method (Thornthwaite & Mather, 1957)															
Precipitation: Fergus Shand Dam (1981-2010), Vegetation: Moderately-Deep Crops, Mature Grasses with Trees/Shubs, Soil: Fine Sand and Clay															
	Units	Annual	% Total	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Temperature	deg C	6.68		-7.4	-6.3	-1.9	5.7	12.2	17.5	20.0	19.0	14.9	8.3	2.1	-3.9
Heat Index (i)	-	35.09		0.00	0.00	0.00	1.22	3.86	6.66	8.16	7.55	5.22	2.15	0.27	0.00
Unadjusted PET (UPET)	mm/day	1.038		0.00	0.00	0.00	0.87	1.91	2.78	3.20	3.03	2.35	1.28	0.31	0.00
latitude correction (r)	-			24.3	24.5	30.6	33.6	37.9	38.5	38.8	36	31.2	28.5	24.2	23
Potential Evapotranspiration (PET)	mm	559.3		0.0	0.0	0.0	29.2	72.5	107.1	124.0	109.1	73.5	36.5	7.4	0.0
Precipitation (P)	mm	945.9	100.0	67.9	55.9	59.6	74.1	86.9	83.8	89.2	96.6	93.1	77.2	93	68.6
P - PET	mm			67.9	55.9	59.6	44.9	14.4	-23.3	-34.8	-12.5	19.6	40.7	85.6	68.6
Accum. Water Loss	mm							0.0	-23.3	-58.1	-70.6				
Soil Moisture Retention (Storage - ST)	mm			75.0	75.0	75.0	75.0	75.0	54.0	34.0	28.0	47.6	75.0	75.0	75.0
Storage Change (ΔST)	mm			75.0	0.0	0.0	0.0	0.0	-21.0	-20.0	-6.0	19.6	27.4	0.0	0.0
Actual Evapotranspiration (AE)	mm	535.7	56.6	0.0	0.0	0.0	29.2	72.5	104.8	109.2	102.6	73.5	36.5	7.4	0.0
Water Balance as Surplus/Deficit	mm	410.2	43.4	67.9	55.9	59.6	44.9	14.4	-21.0	-20.0	-6.0	19.6	40.7	85.6	68.6
Determination of Water Balance as 'Combined-Runoff' (Recharge + Direct Runoff) - (using WBM Assumptions)															
Soil Moisture Surplus (SMS)	mm	158.2		0.0	0.0	0.0	44.9	14.4	0.0	0.0	0.0	0.0	13.3	85.6	0.0
Water Balance from SMS (Assumption 1)	mm	144.8		10.8	5.4	2.7	23.8	19.1	9.6	4.8	2.4	1.2	0.6	43.1	21.5
				0.03	0.01	0.00	0.00	7.20	3.60	1.80	0.90	0.45	0.22	0.11	0.06
				0.04	0.02	0.01	22.47	11.23	5.62	2.81	1.40	0.70	0.35	0.18	0.09
				10.69	5.35	2.67	1.34	0.67	0.33	0.17	0.08	0.04	0.02	42.78	21.39
Accumulated Snow (Assumption 2)	mm	252.0		0.0	0.0	0.0	252.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Balance from Snow (Assumption 3)	mm	252.0		0.5	0.3	0.1	25.2	113.4	56.7	28.4	14.2	7.1	3.5	1.8	0.9
Water Balance as 'Combined-Runoff'	mm	396.8	42.0	11.3	5.7	2.8	49.0	132.5	66.3	33.1	16.6	8.3	4.1	44.8	22.4

Assumptions for Monthly 'Combined-Runoff' Estimations (from WBM):

- 1 - Combined 'Runoff' from the Soil Moisture Surplus is assumed to be 50% in the first month and then 50% of the remaining soil surplus each following month.
- 2 - All Snow is Accumulated and Stored throughout Winter Sub-Zero Months (i.e. No melt until first above-zero month)
- 3 - Combined 'Runoff' from Snowmelt is assumed to be 10% of the Accumulated Snow in the first month and then 50% of the remaining snowmelt in each following month.

Determination of Recharge + Direct Runoff Components - using MOE Infiltration Factor Method (MOE 1995, 2003)															
Catchment Area (m ²)	MOE Infiltration Factors (0 to 1.00)					Annual Rates				Annual Rates					
	Topography		Soil		Cover	Sum	EvapoT (mm)	Balance (mm)	Recharge (mm)	Runoff (mm)	EvapoT (m ³ /yr)	Balance (m ³ /yr)	Recharge (m ³ /yr)	Runoff (m ³ /yr)	
Pervious, Cultivated Land 143,500 m2	Rolling	0.2	Sand	0.4	Cultivated	0.1	0.7	535.7	410.2	287.1	123.1	76,876	58,861	41,202	17,658
								56.6%	43.4%	30.4%	13.0%	56.6%	43.4%	30.4%	13.0%
Pervious, Pasture & Lawns 15,000 m2	Rolling	0.2	Sand	0.4	Pasture & Lawns	0.15	0.75	535.7	410.2	307.6	102.5	8,036	6,153	4,615	1,538
								56.6%	43.4%	32.5%	10.8%	56.6%	43.4%	32.5%	10.8%
Pervious, Woodland/Wetland 33,400 m2	Rolling	0.2	Sand	0.4	Woodland & Wetland	0.2	0.8	535.7	410.2	328.1	82.0	17,893	13,700	10,960	2,740
								56.6%	43.4%	34.7%	8.7%	56.6%	43.4%	34.7%	8.7%
Impervious Rooftops to Pervious Areas 2,000 m2							0.25	94.6	851.3	212.8	638.5	189	1,703	426	1,277
								10.0%	90.0%	22.5%	67.5%	10.0%	90.0%	22.5%	67.5%
Total Site 193,900 m2												102,994	80,416	57,203	23,213
												56.2%	43.8%	31.2%	12.7%

Assumptions for Evapotranspiration/Recharge/Runoff Proportioning

- 1 - Pervious Areas - by MOE Infiltration Factor Method (MOE 1995, 2003)
- 2 - Impervious Areas Shed to Pervious Areas - Assume 10% Lost to Evapotranspiration and Balance Split 25/75% to Recharge/Runoff

APPENDIX F

Water Chemistry Results (AGAT Laboratories of Mississauga, Ontario)



CLIENT NAME: CHUNG AND VANDER DOELEN
311 VICTORIA STREET NORTH
KITCHENER, ON N2H5E1
(519) 742-8979

ATTENTION TO: Yaroslav Chudin

PROJECT: 1495

AGAT WORK ORDER: 24T129206

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Inorganic Team Lead

DATE REPORTED: Mar 22, 2024

PAGES (INCLUDING COVER): 10

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***Notes**

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.



Certificate of Analysis

AGAT WORK ORDER: 24T129206

PROJECT: 1495

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: CHUNG AND VANDER DOELEN

ATTENTION TO: Yaroslav Chudin

SAMPLING SITE: 968 ST. DAVID ST. N. FERGUS

SAMPLED BY: Y.C.

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-03-13

DATE REPORTED: 2024-03-22

SAMPLE DESCRIPTION:				BH1	BH5	BH6	BH7	
SAMPLE TYPE:				Water	Water	Water	Water	
DATE SAMPLED:				2024-03-11 11:30	2024-03-11 11:30	2024-03-11 11:30	2024-03-11 11:30	
Parameter	Unit	G / S	RDL	5722603	5722663	5722665	RDL	5722666
Electrical Conductivity	µS/cm		2	480	497	596	2	1620
pH	pH Units	6.5-8.5	NA	7.43	7.64	7.62	NA	7.41
Saturation pH (Calculated)				6.53	6.62	6.72		6.36
Langelier Index (Calculated)				0.896	1.02	0.896		1.05
Hardness (as CaCO ₃) (Calculated)	mg/L		0.5	679	688	664	0.5	1260
Total Dissolved Solids	mg/L		10	224	338	412	10	706
Alkalinity (as CaCO ₃)	mg/L		5	291	255	206	5	271
Bicarbonate (as CaCO ₃)	mg/L		5	291	255	206	5	271
Carbonate (as CaCO ₃)	mg/L		5	<5	<5	<5	5	<5
Hydroxide (as CaCO ₃)	mg/L		5	<5	<5	<5	5	<5
Fluoride	mg/L		0.05	<0.05	<0.05	<0.05	0.05	<0.05
Chloride	mg/L		0.10	9.18	2.04	27.3	0.12	269
Nitrate as N	mg/L		0.05	1.48	12.8	24.9	0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	0.05	<0.05
Bromide	mg/L		0.05	<0.05	<0.05	<0.05	0.05	<0.05
Sulphate	mg/L		0.10	1.62	30.1	6.71	0.10	31.5
Ortho Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10	0.10	<0.10
Ammonia as N	mg/L		0.02	0.05	0.06	<0.02	0.02	0.03
Ammonia-Un-ionized (Calculated)	mg/L	0.02	0.000002	0.000774	0.00151	<0.000002	0.000002	0.000453
Total Phosphorus	mg/L	*	0.02	0.73	0.74	1.22	0.06	2.03
Total Organic Carbon	mg/L		0.5	7.6	9.2	8.4	0.5	14.4
True Colour	TCU		2.50	<2.50	<2.50	<2.50	2.50	4.55
Turbidity	NTU		0.5	92.5	192	60.3	0.5	97.6
Total Calcium	mg/L		0.20	204	209	192	0.20	394
Total Magnesium	mg/L		0.10	41.1	40.4	44.9	0.10	65.9
Total Potassium	mg/L		0.50	3.04	3.57	3.32	0.50	6.64
Total Sodium	mg/L		0.10	3.94	4.32	3.03	0.10	98.5
Aluminum-dissolved	mg/L	*	0.004	0.004	0.008	<0.004	0.004	<0.004
Total Antimony	mg/L	0.020	0.003	<0.003	<0.003	<0.003	0.003	<0.003

Certified By:

Yris Veraistegui



Certificate of Analysis

AGAT WORK ORDER: 24T129206

PROJECT: 1495

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: CHUNG AND VANDER DOELEN

SAMPLING SITE: 968 ST. DAVID ST. N. FERGUS

ATTENTION TO: Yaroslav Chudin

SAMPLED BY: Y.C.

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-03-13

DATE REPORTED: 2024-03-22

SAMPLE DESCRIPTION:				BH1	BH5	BH6	BH7	
SAMPLE TYPE:				Water	Water	Water	Water	
DATE SAMPLED:				2024-03-11 11:30	2024-03-11 11:30	2024-03-11 11:30	2024-03-11 11:30	
Parameter	Unit	G / S	RDL	5722603	5722663	5722665	RDL	5722666
Total Arsenic	mg/L	0.1	0.003	0.006	0.008	0.007	0.003	0.007
Total Barium	mg/L		0.002	0.043	0.059	0.050	0.002	0.203
Total Beryllium	mg/L	*	0.001	<0.001	<0.001	<0.001	0.001	<0.001
Total Boron	mg/L	0.2	0.010	0.026	0.031	0.017	0.010	0.031
Total Cadmium	mg/L	0.0002	0.0001	0.0003	0.0003	0.0003	0.0001	0.0004
Total Chromium	mg/L		0.003	0.011	0.018	0.011	0.003	0.042
Total Cobalt	mg/L	0.0009	0.0005	0.0066	0.0096	0.0084	0.0005	0.0137
Total Copper	mg/L	0.005	0.002	0.021	0.029	0.030	0.002	0.037
Total Iron	mg/L	0.3	0.050	12.2	18.0	15.2	0.050	31.5
Total Lead	mg/L	*	0.0005	0.0224	0.0322	0.0318	0.0005	0.0249
Total Manganese	mg/L		0.002	0.651	0.860	0.991	0.002	1.03
Total Mercury	mg/L		0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Total Molybdenum	mg/L	0.040	0.002	<0.002	<0.002	<0.002	0.002	<0.002
Total Nickel	mg/L	0.025	0.003	0.012	0.019	0.018	0.003	0.032
Total Selenium	mg/L	0.1	0.002	<0.002	0.004	<0.002	0.002	0.004
Total Silver	mg/L	0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001
Total Strontium	mg/L		0.005	0.298	0.281	0.304	0.005	0.670
Total Thallium	mg/L	0.0003	0.0003	<0.0003	<0.0003	<0.0003	0.0003	<0.0003
Total Tin	mg/L		0.002	0.002	0.002	0.002	0.002	<0.002
Total Titanium	mg/L		0.010	0.199	0.325	0.302	0.010	0.832
Total Tungsten	mg/L	0.030	0.010	<0.010	<0.010	<0.010	0.010	<0.010
Total Uranium	mg/L	0.005	0.0005	<0.0005	0.0006	<0.0005	0.0005	0.0023
Total Vanadium	mg/L	0.006	0.002	0.017	0.022	0.017	0.002	0.052
Total Zinc	mg/L	0.030	0.020	0.153	0.185	0.136	0.020	0.498
Total Zirconium	mg/L	0.004	0.004	<0.004	<0.004	<0.004	0.004	0.004
Lab Filtration Aluminum Dissolved				Y	Y	Y		Y

Certified By:

Yris Veraestegui



AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 24T129206

PROJECT: 1495

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: CHUNG AND VANDER DOELEN

SAMPLING SITE: 968 ST. DAVID ST. N. FERGUS

ATTENTION TO: Yaroslav Chudin

SAMPLED BY: Y.C.

Water Quality Assessment - PWQO (mg/L)

DATE RECEIVED: 2024-03-13

DATE REPORTED: 2024-03-22

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to PWQO * Variable - refer to guideline reference document
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
5722603-5722666 Dilution required, RDL has been increased accordingly.
Un-ionized Ammonia detection limit is a calculated RDL. The calculation of Un-ionized Ammonia is based on lab measured parameters (ammonia as N, pH and temperature). Values are reported as calculated.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

Iris Veraástegui



Exceedance Summary

AGAT WORK ORDER: 24T129206

PROJECT: 1495

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: CHUNG AND VANDER DOELEN

ATTENTION TO: Yaroslav Chudin

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cadmium	mg/L	0.0002	0.0003
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0066
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.021
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	12.2
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.017
5722603	BH1	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.153
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cadmium	mg/L	0.0002	0.0003
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0096
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.029
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	18.0
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.022
5722663	BH5	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.185
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cadmium	mg/L	0.0002	0.0003
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0084
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.030
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	15.2
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.017
5722665	BH6	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.136
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cadmium	mg/L	0.0002	0.0004
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Cobalt	mg/L	0.0009	0.0137
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Copper	mg/L	0.005	0.037
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Iron	mg/L	0.3	31.5
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Nickel	mg/L	0.025	0.032
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Vanadium	mg/L	0.006	0.052
5722666	BH7	ON PWQO	Water Quality Assessment - PWQO (mg/L)	Total Zinc	mg/L	0.030	0.498

Quality Assurance

CLIENT NAME: CHUNG AND VANDER DOELEN

PROJECT: 1495

SAMPLING SITE: 968 ST. DAVID ST. N. FERGUS

AGAT WORK ORDER: 24T129206

ATTENTION TO: Yaroslav Chudin

SAMPLED BY: Y.C.

Water Analysis															
RPT Date: Mar 22, 2024			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Water Quality Assessment - PWQO (mg/L)

Electrical Conductivity	5722603	5722603	480	477	0.6%	< 2	104%	90%	110%						
pH	5722603	5722603	7.43	7.55	1.6%	NA	99%	90%	110%						
Total Dissolved Solids	5720157		190	168	12.3%	< 10	92%	80%	120%						
Alkalinity (as CaCO ₃)	5722603	5722603	291	306	5.0%	< 5	95%	80%	120%						
Bicarbonate (as CaCO ₃)	5722603	5722603	291	306	5.0%	< 5	NA								
Carbonate (as CaCO ₃)	5722603	5722603	<5	<5	NA	< 5	NA								
Hydroxide (as CaCO ₃)	5722603	5722603	<5	<5	NA	< 5	NA								
Fluoride	5718363		<0.05	<0.05	NA	< 0.05	105%	70%	130%	91%	80%	120%	98%	70%	130%
Chloride	5718363		153	152	0.7%	< 0.10	96%	70%	130%	91%	80%	120%	NA	70%	130%
Nitrate as N	5718363		<0.05	<0.05	NA	< 0.05	100%	70%	130%	98%	80%	120%	100%	70%	130%
Nitrite as N	5718363		<0.05	<0.05	NA	< 0.05	101%	70%	130%	101%	80%	120%	109%	70%	130%
Bromide	5718363		<0.05	<0.05	NA	< 0.05	105%	70%	130%	96%	80%	120%	95%	70%	130%
Sulphate	5718363		<0.10	<0.10	NA	< 0.10	94%	70%	130%	94%	80%	120%	94%	70%	130%
Ortho Phosphate as P	5718363		<0.10	<0.10	NA	< 0.10	101%	70%	130%	104%	80%	120%	105%	70%	130%
Ammonia as N	5724966		<0.02	<0.02	NA	< 0.02	108%	70%	130%	105%	80%	120%	103%	70%	130%
Total Phosphorus	5737950		0.05	0.05	NA	< 0.02	99%	70%	130%	99%	80%	120%	105%	70%	130%
Total Organic Carbon	5720157		1.8	1.7	NA	< 0.5	98%	90%	110%	98%	90%	110%	99%	80%	120%
True Colour	5720157		<2.50	<2.50	NA	< 2.5	100%	90%	110%						
Turbidity	5722603	5722603	92.5	144	43.6%	< 0.5	90%	80%	120%						
Total Calcium	5724836		80.1	80.4	0.4%	< 0.20	113%	70%	130%	107%	80%	120%	108%	70%	130%
Total Magnesium	5724836		6.75	6.85	1.5%	< 0.10	118%	70%	130%	111%	80%	120%	94%	70%	130%
Total Potassium	5724836		5.43	5.50	1.3%	< 0.50	113%	70%	130%	106%	80%	120%	97%	70%	130%
Total Sodium	5724836		858	817	4.9%	< 0.10	114%	70%	130%	108%	80%	120%	NA	70%	130%
Aluminum-dissolved	5722603	5722603	0.004	0.005	NA	< 0.004	104%	70%	130%	110%	80%	120%	104%	70%	130%
Total Antimony	5724836		<0.003	<0.003	NA	< 0.003	105%	70%	130%	105%	80%	120%	100%	70%	130%
Total Arsenic	5724836		<0.003	<0.003	NA	< 0.003	99%	70%	130%	105%	80%	120%	102%	70%	130%
Total Barium	5724836		0.009	0.010	NA	< 0.002	100%	70%	130%	105%	80%	120%	97%	70%	130%
Total Beryllium	5724836		<0.001	<0.001	NA	< 0.001	104%	70%	130%	115%	80%	120%	94%	70%	130%
Total Boron	5724836		0.072	0.076	5.4%	< 0.010	101%	70%	130%	112%	80%	120%	93%	70%	130%
Total Cadmium	5724836		0.0002	0.0002	NA	< 0.0001	102%	70%	130%	106%	80%	120%	98%	70%	130%
Total Chromium	5724836		0.005	0.005	NA	< 0.003	100%	70%	130%	106%	80%	120%	105%	70%	130%
Total Cobalt	5724836		0.0013	0.0015	NA	< 0.0005	101%	70%	130%	104%	80%	120%	103%	70%	130%
Total Copper	5724836		0.026	0.026	0.0%	< 0.002	99%	70%	130%	106%	80%	120%	98%	70%	130%
Total Iron	5724836		1.68	1.67	0.6%	< 0.050	102%	70%	130%	112%	80%	120%	108%	70%	130%
Total Lead	5724836		0.0079	0.0081	2.5%	< 0.0005	101%	70%	130%	98%	80%	120%	89%	70%	130%
Total Manganese	5724836		0.383	0.389	1.6%	< 0.002	103%	70%	130%	109%	80%	120%	105%	70%	130%
Total Mercury	5722014		<0.0001	<0.0001	NA	< 0.0001	100%	70%	130%	97%	80%	120%	98%	70%	130%
Total Molybdenum	5724836		0.009	0.010	NA	< 0.002	106%	70%	130%	91%	80%	120%	116%	70%	130%
Total Nickel	5724836		0.030	0.028	6.9%	< 0.003	102%	70%	130%	105%	80%	120%	101%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)

Page 6 of 10

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation. RPDs calculated using raw data. The RPD may not be reflective of duplicate values shown, due to rounding of final results.

Results relate only to the items tested. Results apply to samples as received.



Quality Assurance

CLIENT NAME: CHUNG AND VANDER DOELEN

PROJECT: 1495

SAMPLING SITE: 968 ST. DAVID ST. N. FERGUS

AGAT WORK ORDER: 24T129206

ATTENTION TO: Yaroslav Chudin

SAMPLED BY: Y.C.

Water Analysis (Continued)

RPT Date: Mar 22, 2024			DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Selenium	5724836		0.004	0.006	NA	< 0.002	101%	70%	130%	108%	80%	120%	101%	70%	130%
Total Silver	5724836		0.0001	<0.0001	NA	< 0.0001	103%	70%	130%	110%	80%	120%	96%	70%	130%
Total Strontium	5724836		1.15	1.14	0.9%	< 0.005	104%	70%	130%	109%	80%	120%	99%	70%	130%
Total Thallium	5724836		<0.0003	<0.0003	NA	< 0.0003	92%	70%	130%	105%	80%	120%	94%	70%	130%
Total Tin	5724836		<0.002	<0.002	NA	< 0.002	100%	70%	130%	109%	80%	120%	105%	70%	130%
Total Titanium	5724836		<0.010	<0.010	NA	< 0.010	102%	70%	130%	110%	80%	120%	106%	70%	130%
Total Tungsten	5724836		<0.010	<0.010	NA	< 0.010	94%	70%	130%	100%	80%	120%	97%	70%	130%
Total Uranium	5724836		<0.0005	<0.0005	NA	< 0.0005	92%	70%	130%	109%	80%	120%	106%	70%	130%
Total Vanadium	5724836		0.003	0.002	NA	< 0.002	103%	70%	130%	110%	80%	120%	111%	70%	130%
Total Zinc	5724836		0.119	0.125	4.9%	< 0.020	100%	70%	130%	105%	80%	120%	93%	70%	130%
Total Zirconium	5724836		<0.004	<0.004	NA	< 0.004	101%	70%	130%	106%	80%	120%	109%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

Certified By:

Yris Veraestegui

Method Summary

CLIENT NAME: CHUNG AND VANDER DOELEN
PROJECT: 1495
SAMPLING SITE: 968 ST. DAVID ST. N. FERGUS
AGAT WORK ORDER: 24T129206
ATTENTION TO: Yaroslav Chudin
SAMPLED BY: Y.C.

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	modified from SM 2510 B	PC TITRATE
pH	INOR-93-6000	modified from SM 4500-H+ B	PC TITRATE
Saturation pH (Calculated)		SM 2320 B	CALCULATION
Langelier Index (Calculated)		SM 2330B	CALCULATION
Hardness (as CaCO ₃) (Calculated)	MET-93-6105	modified from EPA SW-846 6010C & 200.7 & SM 2340 B	CALCULATION
Total Dissolved Solids	INOR-93-6028	modified from EPA 1684, ON MOECC E3139, SM 2540C, D	BALANCE
Alkalinity (as CaCO ₃)	INOR-93-6000	Modified from SM 2320 B	PC TITRATE
Bicarbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Carbonate (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Hydroxide (as CaCO ₃)	INOR-93-6000	modified from SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	modified from SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-93-6059	modified from SM 4500-NH ₃ H	LACHAT FIA
Ammonia-Un-ionized (Calculated)		MOE REFERENCE, PWQOs Tab 2	CALCULATION
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Total Organic Carbon	INOR-93-6049	modified from SM 5310 B	SHIMADZU CARBON ANALYZER
True Colour	INOR-93-6074	modified from SM 2120 B	LACHAT FIA
Turbidity	INOR-93-6000	modified from SM 2130 B	PC TITRATE
Total Calcium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Magnesium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Potassium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Total Sodium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP/MS
Aluminum-dissolved	MET-93-6103	modified from EPA 200.8 and EPA 3005A	ICP-MS
Total Antimony	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Arsenic	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Barium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Beryllium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Boron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cadmium	MET -93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Chromium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Cobalt	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS



Method Summary

CLIENT NAME: CHUNG AND VANDER DOELEN

PROJECT: 1495

SAMPLING SITE: 968 ST. DAVID ST. N. FERGUS

AGAT WORK ORDER: 24T129206

ATTENTION TO: Yaroslav Chudin

SAMPLED BY: Y.C.

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Copper	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Iron	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Lead	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Manganese	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Mercury	MET-93-6100	modified from EPA 245.2 and SM 3112 B	CVAAS
Total Molybdenum	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Nickel	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Selenium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Silver	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Strontium	INOR-93-6003	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Thallium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tin	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Titanium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Tungsten	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Uranium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Vanadium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zinc	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Total Zirconium	MET-93-6103	modified from EPA 200.8, 3005A, 3010A & 6020B	ICP-MS
Lab Filtration Aluminum Dissolved	SR-78-9001		FILTRATION



Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: CVD Engineering Ltd.
Contact: Yaroslav Chudlin
Address: 311 Victoria St. W., Etobicoke, ON M9H 5E1
Phone: _____ Fax: _____
Reports to be sent to:
1. Email: yaroslav.chudlin@cvdengineering.com
2. Email: _____

Project Information:

Project: 1495
Site Location: 968 St. David St. N., Fergus, ON
Sampled By: P.C.
AGAT Quote #: _____ PO: _____
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Company: _____ Bill To Same: Yes ☒ No ☐
Contact: _____
Address: _____
Email: ap@cvdengineering.com

Regulatory Requirements:

(Please check all applicable boxes)

- ☐ Regulation 153/04 ☐ Regulation 406 ☐ Sewer Use
☐ Sanitary ☐ Storm
Table Indicate One Table Indicate One
☐ Ind/Com ☐ Ind/Com
☐ Res/Park ☐ Res/Park
☐ Agriculture ☐ Agriculture
Soil Texture (Check One) ☐ Regulation 558
☐ Coarse ☐ CCME
☐ Fine
☒ Prov. Water Quality Objectives (PWQO)
☐ Other
Indicate One

Is this submission for a Record of Site Condition (RSC)?

☐ Yes ☒ No

Report Guideline on Certificate of Analysis

☒ Yes ☐ No

Legal Sample ☐

Sample Matrix Legend

GW Ground Water SD Sediment
O Oil SW Surface Water
P Paint R Rock/Shale
S Soil

Laboratory Use Only

Work Order #: 24T129206
Cooler Quantity: 1 med.
Arrival Temperatures: 3.7 3.9 4.3
Depot Temperatures: _____
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: Loss seal

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply): _____

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CSR

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N	Field Filtered - Metals, Hg, CrVI, DOC	O. Reg 153	O. Reg 406	O. Reg 558	Potentially Hazardous or High Concentration (Y/N)
1. <u>BH1</u>	<u>March 11/24</u>	<u>11:30 AM</u>	<u>8</u>	<u>GW</u>		<u>2</u>					
2. <u>BH5</u>	<u>"</u>	<u>12:30 PM</u>	<u>8</u>	<u>"</u>		<u>2</u>					
3. <u>BH6</u>	<u>"</u>	<u>1:45 PM</u>	<u>8</u>	<u>"</u>		<u>2</u>					
4. <u>BH7</u>	<u>"</u>	<u>3:45 PM</u>	<u>8</u>	<u>"</u>		<u>2</u>					
5.		AM PM									
6.		AM PM									
7.		AM PM									
8.		AM PM									
9.		AM PM									
10.		AM PM									
11.		AM PM									

Samples Relinquished By (Print Name and Sign): <u>Yaroslav Chudlin</u>	Date: <u>March 13/24</u>	Time: <u>12:00 PM</u>	Samples Received By (Print Name and Sign): <u>T. Khan</u>	Date: <u>March 13</u>	Time: <u>1:46 PM</u>
Samples Relinquished By (Print Name and Sign): _____	Date: _____	Time: _____	Samples Received By (Print Name and Sign): _____	Date: _____	Time: _____
Samples Relinquished By (Print Name and Sign): _____	Date: _____	Time: _____	Samples Received By (Print Name and Sign): _____	Date: _____	Time: _____

Page 1 of 1

Nº: T-153484

APPENDIX G

MECP Well Records





Ministry
of the
Environment
Ontario

The Ontario Water Resources Act

WATER WELL RECORD

1. PRINT ONLY IN SPACES PROVIDED
2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

6709834

67009

CON

16

COUNTY OR DISTRICT Wellington	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE Nichol	CON. BLOCK, TRACT, SURVEY ETC. XVI	LOT 17
OWNER (SURNAME FIRST) Fergus PUC	ADDRESS P.O. Box 10, Fergus, Ont. N1M 2W7	DATE COMPLETED DAY 15 MO 5 YR 89	

ZONE 21	EASTING	NORTHING	RC	ELEVATION	RC	BASIN CODE	II	III	IV
-------------------	---------	----------	----	-----------	----	------------	----	-----	----

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)					DEPTH - FEET	
GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION		FROM	TO
Brown	Clay	Fill, Gravel Silt			0	18
Brown	Clay	Gravel			18	24
Grey	Clay	Gravel			24	84
Grey	Limestone				84	165
Brown	Limestone				165	213
Grey	Limestone				213	225
Brown	Limestone				225	232
Lt. Grey	Limestone				232	315
Brown	Limestone				315	378
Grey	Limestone				378	400
White	Limestone				400	402

31	32
----	----

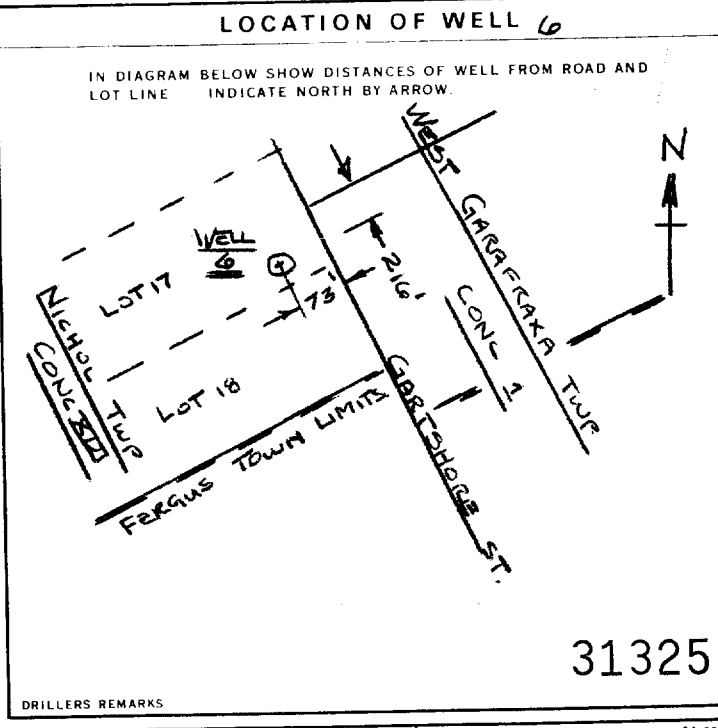
WATER RECORD	
WATER FOUND AT - FEET 128' - 402'	KIND OF WATER 1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS

CASING & OPEN HOLE RECORD			
INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
12	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	.375	109.5
11	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	109.5	402

PLUGGING & SEALING RECORD		
DEPTH SET AT - FEET	MATERIAL AND TYPE	(CEMENT GROUT LEAD PACKER ETC.)
0	109.5	12" casing cemented in 18" dia. open hole

PUMPING TEST	
PUMPING TEST METHOD 1 ☒ PUMP 2 ☐ BAILER	PUMPING RATE GPM 350
STATIC LEVEL 19-21 57.51	WATER LEVEL END OF PUMPING 22-24 153.29
15 MINUTES 20-28 109.52	30 MINUTES 29-31 112.41
45 MINUTES 32-34 -	60 MINUTES 35-37 115.75
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT GPM
RECOMMENDED PUMP TYPE ☐ SHALLOW ☒ DEEP	RECOMMENDED PUMP SETTING 250
	RECOMMENDED PUMPING RATE 300

FINAL STATUS OF WELL	
1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED 9 ☐ DEWATERING
WATER USE	
1 ☐ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ OTHER	6 ☐ COMMERCIAL 7 ☒ MUNICIPAL 8 ☐ PUBLIC SUPPLY 9 ☐ COOLING OR AIR CONDITIONING 10 ☐ NOT USED
METHOD OF CONSTRUCTION	
1 ☐ CABLE TOOL 2 ☒ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☒ ROTARY (AIR) 5 ☐ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING 10 ☐ DIGGING ☐ OTHER



NAME OF WELL CONTRACTOR International Water Supply, Ltd.	WELL CONTRACTOR'S LICENCE NUMBER 2801
ADDRESS 342 Bayview Dr., Barrie, Ont. L4M 4T5	WELL TECHNICIAN'S LICENCE NUMBER T0117
NAME OF WELL TECHNICIAN R.C. Magee	SUBMISSION DATE DAY 14 MO 07 YR 89

DATA SOURCE 2801	DATE RECEIVED JUL 20 1989
DATE OF INSPECTION	INSPECTOR
REMARKS	

CSS.ES

WATER WELL RECORD

6710068

MUNICIPALITY 67009

CON. 15

1. PRINT ONLY IN SPACES PROVIDED

2. CHECK ☒ CORRECT BOX WHERE APPLICABLE

11

COUNTY OR DISTRICT Wellington	TOWNSHIP, BOROUGH, CITY, TOWN, VILLAGE Nichol	CON. BLOCK, TRACT, SURVEY, ETC. XV	LOT 20
OWNER (SURNAME FIRST) W. Dixon & Sons Ltd.	ADDRESS 745 St. David St. N., FERGUS, ONT. N1M 2L1	DATE COMPLETED DAY 29 MO 03 YR 89	
21	2	3	4

LOG OF OVERBURDEN AND BEDROCK MATERIALS (SEE INSTRUCTIONS)

GENERAL COLOUR	MOST COMMON MATERIAL	OTHER MATERIALS	GENERAL DESCRIPTION	DEPTH - FEET	
				FROM	TO
	Gravel	Fill		0	3
Br.	Clay	Stones		3	20
Gr.	Clay			20	30
Gr.	Clay	Stones		30	77
Br./Gr.	Limestone			77	96
Gr.	Limestone			96	125
Br.	Limestone			125	265

31

32

41

WATER RECORD

WATER FOUND AT - FEET	KIND OF WATER
235-265	1 ☒ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS
15-18	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS
20-23	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS
25-28	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS
30-33	1 ☐ FRESH 3 ☐ SULPHUR 2 ☐ SALTY 4 ☐ MINERALS 6 ☐ GAS

CASING & OPEN HOLE RECORD

INSIDE DIAM. INCHES	MATERIAL	WALL THICKNESS INCHES	DEPTH - FEET
10-11	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC	1.188	0 85
17-18	1 ☒ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC		85 265
24-25	1 ☐ STEEL 2 ☐ GALVANIZED 3 ☐ CONCRETE 4 ☐ OPEN HOLE 5 ☐ PLASTIC		

SCREEN	SIZE(S) OF OPENING (SLOT NO.)	DIAMETER 34-38 INCHES	LENGTH 39-40 FEET
	MATERIAL AND TYPE	DEPTH TO TOP OF SCREEN 41-44 FEET	

PLUGGING & SEALING RECORD

DEPTH SET AT - FEET	MATERIAL AND TYPE (CEMENT GROUT, LEAD PACKER, ETC.)
10-13	14-17
18-21	22-25
26-29	30-33

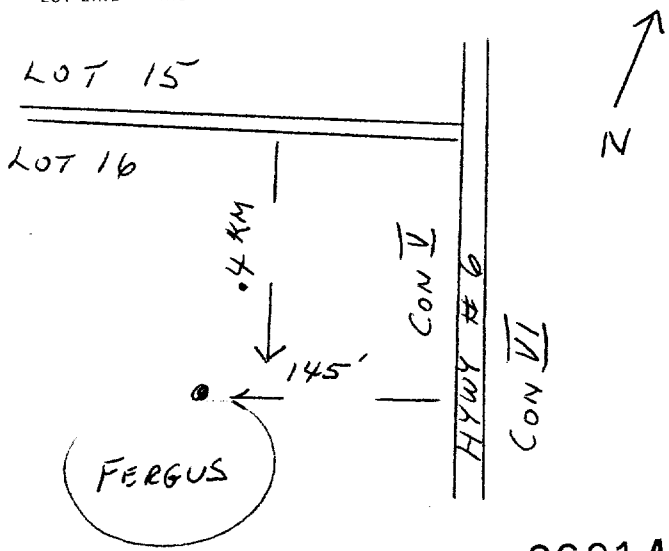
71

PUMPING TEST

PUMPING TEST METHOD 1 ☐ PUMP 2 ☒ BAILEY	PUMPING RATE 20 GPM	DURATION OF PUMPING 15-16 HOURS 15 MINS
STATIC LEVEL 97 FEET	WATER LEVEL END OF PUMPING 140 FEET	WATER LEVELS DURING 15 MINUTES 140 FEET 30 MINUTES 140 FEET 45 MINUTES 140 FEET 60 MINUTES 140 FEET
IF FLOWING, GIVE RATE	PUMP INTAKE SET AT 160 FEET	WATER AT END OF TEST 18 FEET
RECOMMENDED PUMP TYPE ☐ SHALLOW ☒ DEEP	RECOMMENDED PUMP SETTING 160 FEET	RECOMMENDED PUMPING RATE 18 GPM

LOCATION OF WELL

IN DIAGRAM BELOW SHOW DISTANCES OF WELL FROM ROAD AND LOT LINE. INDICATE NORTH BY ARROW.



36914

DRILLERS REMARKS

FINAL STATUS OF WELL 1 ☒ WATER SUPPLY 2 ☐ OBSERVATION WELL 3 ☐ TEST HOLE 4 ☐ RECHARGE WELL	5 ☐ ABANDONED, INSUFFICIENT SUPPLY 6 ☐ ABANDONED, POOR QUALITY 7 ☐ UNFINISHED 9 ☐ DEWATERING
WATER USE 1 ☐ DOMESTIC 2 ☐ STOCK 3 ☐ IRRIGATION 4 ☐ INDUSTRIAL 5 ☐ OTHER	5 ☐ COMMERCIAL 6 ☐ MUNICIPAL 7 ☐ PUBLIC SUPPLY 8 ☒ COOLING OR AIR CONDITIONING 9 ☐ NOT USED
METHOD OF CONSTRUCTION 1 ☐ CABLE TOOL 2 ☒ ROTARY (CONVENTIONAL) 3 ☐ ROTARY (REVERSE) 4 ☐ ROTARY (AIR) 5 ☐ AIR PERCUSSION	6 ☐ BORING 7 ☐ DIAMOND 8 ☐ JETTING 9 ☐ DRIVING 10 ☐ DIGGING 11 ☐ OTHER

NAME OF WELL CONTRACTOR Loughlin Drilling Ltd.	WELL CONTRACTOR'S LICENCE NUMBER 3317
ADDRESS R.R. 1, Hillsburgh Ont.	
NAME OF WELL TECHNICIAN ROY LANG	WELL TECHNICIAN'S LICENCE NUMBER T-0158
SIGNATURE OF TECHNICIAN/CONTRACTOR R. Lang	SUBMISSION DATE DAY 31 MO 10 YR 89

DATA SOURCE 3317	DATE RECEIVED NOV 15 1989
DATE OF INSPECTION	INSPECTOR
REMARKS	

CSS.ES

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11

6712246

Municipality
67009

Con.
CON

15

25-97

County or District

Township/Borough/City/Town/Village

Con block tract survey, etc.

Lot

Address

Date completed

21 05 97

P.O. Box FERGUS, ONT N1M-2W7

Northings

PC

Elevation

RC

Basin Code

ii

iii

iv

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
BROWN	SAND			0	30
GREY	CLAY	SAND		30	50
GREY	CLAY	GRAVEL		50	94
BROWN	ROCK			94	115
GREY	ROCK			115	140
TOTAL DEPTH				140'	
6" DRIVE SHOE.					

31
32

WATER RECORD			
Water found at - feet	Kind of water		
10-13	1 ☐ Fresh	3 ☐ Sulphur	14
	2 ☐ Salty	4 ☐ Minerals	
		6 ☐ Gas	
15-18	1 ☐ Fresh	3 ☐ Sulphur	19
	2 ☐ Salty	4 ☐ Minerals	
		6 ☐ Gas	
20-23	1 ☐ Fresh	3 ☐ Sulphur	24
	2 ☐ Salty	4 ☐ Minerals	
		6 ☐ Gas	
25-28	1 ☐ Fresh	3 ☐ Sulphur	29
	2 ☐ Salty	4 ☐ Minerals	
		6 ☐ Gas	
30-33	1 ☐ Fresh	3 ☐ Sulphur	34
	2 ☐ Salty	4 ☐ Minerals	
		6 ☐ Gas	

CASING & OPEN HOLE RECORD			
Inside diam inches	Material	Wall thickness inches	Depth - feet
10-11	1 ☒ Steel	12	
	2 ☐ Galvanized		
	3 ☐ Concrete		
	4 ☐ Open hole		
	5 ☐ Plastic		
17-18	1 ☐ Steel	19	
	2 ☐ Galvanized		
	3 ☐ Concrete		
	4 ☒ Open hole		
	5 ☐ Plastic		
24-25	1 ☐ Steel	26	
	2 ☐ Galvanized		
	3 ☐ Concrete		
	4 ☐ Open hole		
	5 ☐ Plastic		

Sizes of opening (Slot No.)	Diameter	Length
	Inches	feet
Material and type		Depth at top of screen
		feet

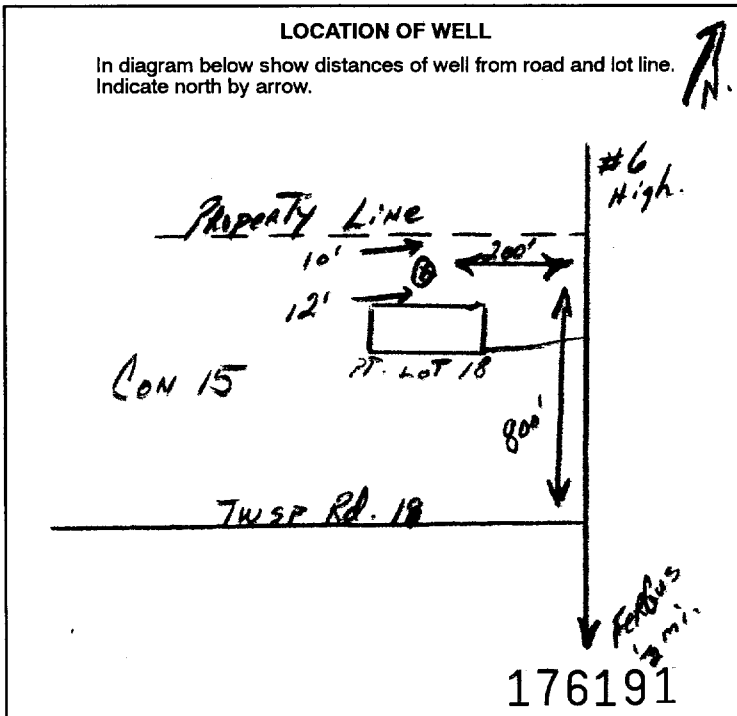
61				PLUGGING & SEALING RECORD			
☒ Annular space				☐ Abandonment			
Depth set at - feet				Material and type (Cement grout, bentonite, etc.)			
From		To					
10-13		25 ¹⁷		BENTONITE			
18-21		22-25					
26-29		30-33		80			

PUMPING TEST METHOD		Pumping rate	Duration of pumping
1 ☒ Pump	2 ☐ Bailer	3 GPM	1 Hours 0 Mins
Static level	Water level end of pumping	Water levels during	
		1 ☒ Pumping	2 ☐ Recovery
19-21	22-24	15 minutes	30 minutes
44 feet	125 feet	105 feet	125 feet
25-28	29-32	45 minutes	60 minutes
		125 feet	125 feet
If flowing give rate		Pump intake set at	
GPM		feet	
Recommended pump type		Water at end of test	
☐ Shallow ☒ Deep		☒ Clear ☐ Cloudy	
Recommended pump setting		Recommended pump rate	
135 feet		3 GPM	

FINAL STATUS OF WELL			
1 ☒ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished	
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well	
3 ☐ Test hole	7 ☐ Abandoned (Other)		
4 ☐ Recharge well	8 ☐ Dewatering		

WATER USE			
1 ☒ Domestic	5 ☐ Commercial	9 ☐ Not used	
2 ☐ Stock	6 ☐ Municipal	10 ☐ Other	
3 ☐ Irrigation	7 ☐ Public supply		
4 ☐ Industrial	8 ☐ Cooling & air conditioning		

METHOD OF CONSTRUCTION			
1 ☐ Cable tool	5 ☐ Air percussion	9 ☐ Driving	
2 ☐ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging	
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other	
4 ☒ Rotary (air)	8 ☐ Jetting		



Name of Well Contractor		Well Contractor's Licence No.
GRAHAM WELL DRILLING LTD		2336
Address		
RR#5 ROCKWOOD, ONT. N0B-2K0		
Name of Well Technician		Well Technician's Licence No.
Jim Wilson		T-1924
Signature of Technician/Contractor		Submission date
Robert W. Graham		030 05 97

Data source		Contractor	Date received
		2336	JUN 27 1997
Date of inspection		Inspector	
Remarks			

CSS. S



The Ontario Water Resources Act

WATER WELL RECORD

Print only in spaces provided.
Mark correct box with a checkmark, where applicable.

11

6713078

Municipality
67009

Con.
CON 16

64-99

County or District WELLINGTON		Township/Borough/City/Town/Village NICHOL TWP		Con block tract survey, etc. 16		Lot 16	
Owner's surname 118521 ONTARIO LTD		First name 28-47		Address 142 South River Rd. ELORA, ONT.		Date completed 26 08 99 day month year	
Zone U T M		Easting 12 17		Northing 18 24		RC 25 26	
Elevation 30 31		Basin Code ii iii iv		RC 30 31		47	

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
BROWN	SAND			0	25
GREY	CLAY	STONES		25	70
GREY	CLAY	GRAVEL		70	83
BROWN	ROCK			83	115
GY-BROWN	ROCK			115	190
			TOTAL DEPTH	190'	
		6" DRIVE SHAFT			

31

32

41		WATER RECORD					
Water found at - feet		Kind of water					
10-13		1 ☒ Fresh	3 ☐ Sulphur			14	
2 ☐ Salty		4 ☐ Minerals					
190		6 ☐ Gas					
15-18		1 ☐ Fresh	3 ☐ Sulphur			19	
		2 ☐ Salty	4 ☐ Minerals				
		6 ☐ Gas					
20-23		1 ☐ Fresh	3 ☐ Sulphur			24	
		2 ☐ Salty	4 ☐ Minerals				
		6 ☐ Gas					
25-28		1 ☐ Fresh	3 ☐ Sulphur			29	
		2 ☐ Salty	4 ☐ Minerals				
		6 ☐ Gas					
30-33		1 ☐ Fresh	3 ☐ Sulphur			34	
		2 ☐ Salty	4 ☐ Minerals				
		6 ☐ Gas					

51		CASING & OPEN HOLE RECORD			
Inside diam inches	Material	Wall thickness inches	Depth - feet		
			From	To	
10-11	1 ☒ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	12		13-16	
6"			188	+1 84	
17-18	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☒ Open hole 5 ☐ Plastic	19		20-23	
6"			84	190	
24-25	1 ☐ Steel 2 ☐ Galvanized 3 ☐ Concrete 4 ☐ Open hole 5 ☐ Plastic	26		27-30	

SCREEN	Sizes of opening (Slot No.)	31-33	Diameter	34-38	Length	39-40
			inches		feet	
	Material and type			Depth at top of screen		
				feet		

61		PLUGGING & SEALING RECORD	
☒ Annular space		☐ Abandonment	
Depth set at - feet		Material and type (Cement grout, bentonite, etc.)	
From	To		
10-13	14-17		
0	25	BENTONITE.	
18-21	22-25		
26-29	30-33	80	

PUMPING TEST	Pumping test method ¹⁰ 1 ☒ Pump 2 ☐ Bailer		Pumping rate ¹¹⁻¹⁴ 7 GPM		Duration of pumping ¹⁷⁻¹⁸ ...1... Hours ...0... Mins	
	Static level ¹⁹⁻²¹	Water level end of pumping ²²⁻²⁴	Water levels during 1 ☒ Pumping 2 ☐ Recovery			
	80 feet	120 feet	15 minutes ²⁶⁻²⁸ 93 feet	30 minutes ²⁹⁻³¹ 104 feet	45 minutes ³²⁻³⁴ 115 feet	60 minutes ³⁵⁻³⁷ 120 feet
	If flowing give rate ³⁸⁻⁴¹ GPM	Pump intake set at feet		Water at end of test ⁴² ☒ Clear ☐ Cloudy		
	Recommended pump type ☐ Shallow ☒ Deep	Recommended pump setting ⁴³⁻⁴⁵ 130 feet		Recommended pump rate ⁴⁶⁻⁴⁹ 7 GPM		

FINAL STATUS OF WELL 54

1 ☒ Water supply	5 ☐ Abandoned, insufficient supply	9 ☐ Unfinished
2 ☐ Observation well	6 ☐ Abandoned, poor quality	10 ☐ Replacement well
3 ☐ Test hole	7 ☐ Abandoned (Other)	
4 ☐ Recharge well	8 ☐ Dewatering	

WATER USE 55-56

1 ☒ Domestic	5 ☐ Commercial	9 ☐ Not used
2 ☐ Stock	6 ☐ Municipal	10 ☐ Other
3 ☐ Irrigation	7 ☐ Public supply	
4 ☐ Industrial	8 ☐ Cooling & air conditioning	

METHOD OF CONSTRUCTION 57

1 ☐ Cable tool	5 ☐ Air percussion	9 ☐ Driving
2 ☐ Rotary (conventional)	6 ☐ Boring	10 ☐ Digging
3 ☐ Rotary (reverse)	7 ☐ Diamond	11 ☐ Other
4 ☒ Rotary (air)	8 ☐ Jetting	

LOCATION OF WELL

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

800'

400'

16'

House

Lot 16

CON 16

ARTHUR

196667

Name of Well Contractor	Well Contractor's Licence No.
GRAHAM WELL DRILLING LTD	2336
Address	
RR#5 ROCKWOOD, ONT. N0B-2K0	
Name of Well Technician	Well Technician's Licence No.
Jim Wilson	T-1924.
Signature of Technician/Contractor	Submission date
<i>[Signature]</i>	031 mo 08 yr

MINISTRY USE ONLY	Data source	58 Contractor	59-62	Date received	63-68
		2336		SEP 08 1999	
	Date of inspection	Inspector			
	Remarks				

Measurements recorded in: ☒ Metric ☐ Imperial

Address of Well Location (Street Number/Name) 6581 Hwy 6 N			Township West Garafraxa		Lot 12	Concession 1	
County/District/Municipality Wellington			City/Town/Village Fergus		Province Ontario		Postal Code N1M2W3
UTM Coordinates NAD 83		Zone 17	Easting 548508	Northing 4840921		Municipal Plan and Sublot Number	
						Other	

Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
Brown	Sand			0	10.66
Gray	Clay & stones			10.66	29.87
Gray	Clay			29.87	32.30
Brown	limestone			32.30	54.25

Annular Space			
Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	10 m	Bentonite Grout	.25

Method of Construction		Well Use	
☐ Cable Tool	☐ Diamond	☐ Public	☐ Commercial
☒ Rotary (Conventional)	☐ Jetting	☒ Domestic	☐ Municipal
☐ Rotary (Reverse)	☐ Driving	☐ Livestock	☐ Test Hole
☐ Boring	☐ Digging	☐ Irrigation	☐ Cooling & Air Conditioning
☐ Air percussion		☐ Industrial	
☐ Other, specify		☐ Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To	
15.9	steel	188	1.50	33.2	☒ Water Supply
					☐ Replacement Well
					☐ Test Hole
					☐ Recharge Well
					☐ Dewatering Well
					☐ Observation and/or Monitoring Hole
					☐ Alteration (Construction)
					☐ Abandoned, Insufficient Supply
					☐ Abandoned, Poor Water Quality
					☐ Abandoned, other, specify
					☐ Other, specify

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To	

Water Details		Hole Diameter		
Water found at Depth (m/ft)	Kind of Water: ☐ Fresh ☒ Untested	Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
54.15 (m/ft)	☐ Gas ☐ Other, specify	0	33.2	22.8
		33.2	54.25	15.6

Well Contractor and Well Technician Information			
Business Name of Well Contractor Well Initiatives		Well Contractor's Licence No. 7 2 2 1	
Business Address (Street Number/Name) 15 Town line		Municipality Owen Sound	
Province ON	Postal Code L9W3R4	Business E-mail Address	
Bus. Telephone No. (inc. area code) 5198468289		Name of Well Technician (Last Name, First Name) Loesch Kim	
Well Technician's Licence No. T 9 2 7		Signature of Technician and/or Contractor [Signature]	
		Date Submitted 20130630	

Results of Well Yield Testing			
After test of well yield, water was:		Draw Down	
☒ Clear and sand free		Time (min)	Water Level (m/ft)
☐ Other, specify		Static Level	30.08
If pumping discontinued, give reason:		1	31.05
Pump intake set at (m/ft) 175		2	31.22
Pumping rate (l/min / GPM) 5 IGPM		3	31.50
Duration of pumping 1 hrs + 0 min		4	31.72
Final water level end of pumping (m/ft) 33.28		5	31.86
If flowing give rate (l/min / GPM) 175		10	32.33
Recommended pump depth (m/ft) 175		15	32.60
Recommended pump rate (l/min / GPM) 5 IGPM		20	32.76
Well production (l/min / GPM)		25	32.87
Disinfected?		30	32.97
☒ Yes ☐ No		40	33.14
		50	33.28
		60	33.38
			30.47

Map of Well Location
Please provide a map below following instructions on the back.
Comments:

Well owner's information package delivered	Date Package Delivered	Ministry Use Only
☐ Yes ☒ No	Y Y Y Y M M D D D 20130613	Audit No. Z159276
	Date Work Completed	Received JUL 09 2013

APPENDIX H

Limitations of Report



STATEMENT OF LIMITATIONS

1. The work performed in this report was carried out in accordance with the Standard Terms of Conditions made part of our contract. The conclusions presented herein are based solely upon the scope of services and time and budgetary limitations described in our contract.
2. The report has been prepared in accordance with generally accepted hydrogeological study and/or engineering practices. No other warranties, either expressed or implied, are made as to the professional services provided under the terms of our contract and included in this report.
3. The services performed and outlined in this report were based, in part, upon visual observations of the site and attendant structures. Our opinion cannot be extended to portions of the site which were unavailable for direct observation, reasonably beyond the control of CHUNG & VANDER DOELEN ENGINEERING LTD.
4. The objective of this report was to assess hydrogeological conditions at the site, within the context of our contract and hydrogeological assessment guidelines within the applicable jurisdiction. Evaluating compliance of past or future owners with applicable local, provincial and federal government laws and regulations was not included in our contract for services.
5. CHUNG & VANDER DOELEN ENGINEERING LTD. has relied in good faith on information and services provided by others while conducting the record search. We accept no responsibility for any deficiency, misstatements or inaccuracies contained in this report as a result of omission, misinterpretation or fraudulent acts of the services used.
6. It should be noted that the observations and recommendations presented in this report are limited to the actual locations explored. The information presented in terms of the thickness and types of the subsoils encountered, groundwater levels, and chemical testing results, etc., are only applicable to the actual locations explored. Variations may be present between these locations. Should significant variation become apparent during later investigations, it may be necessary to reevaluate the findings of this report.
7. The conclusions of this report are based in part, on the information provided by others. The possibility remains that unexpected environmental conditions may be encountered at the site in locations not specifically investigated. Should such an event occur, CHUNG & VANDER DOELEN ENGINEERING LTD. must be notified in order that we may determine if modifications to our conclusions are necessary.



ENCLOSURES



Soil Abbreviations and Terms Used on Record of Borehole Sheets

TERMINOLOGY DESCRIBING COMMON SOIL TYPES:

Topsoil	-	mixture of soil and humus capable of supporting vegetation
Peat	-	mixture of visible and invisible fragments of decayed organic matter
Till	-	unstratified glacial deposit which may range from clay to boulders
Fill	-	soil materials identified as being placed anthropologically

CLASSIFICATION (UNIFIED SYSTEM)

Clay	<0.002mm	
Silt	0.002 to .075mm	
Sand	0.075 to 4.75mm	
	Fine	0.075 to 0.425 mm
	Medium	0.425 to 2.0 mm
	Coarse	2.0 to 4.75 mm
Gravel	4.75 to 75mm	
	Fine	4.75 to 19 mm
	Coarse	19 to 75 mm
Cobbles	75 to 300mm	
Boulders	>300mm	

TERMINOLOGY

Soil Composition	% by Weight
"traces"	<10%
"some"(eg. some silt)	10-20%
Adjective (eg. sandy)	20-35%
"and"(eg. sand and gravel)	35-50%

Standard Penetration Resistance (SPT): Standard Penetration Resistance ('N' Values) refers to the number of blows required to advance a standard (ASTM D1586) 51 mm Ø (2 inch) split-spoon sampler by the use of a free falling, 63.5 Kg (140lbs) hammer. The number of blows from the drop weight is recorded for every 15 cm (6 inches). The hammer is dropped from a distance of 0.76m (30 inches) providing 474.5 Joules per blow. When the sampler is driven a total of 45 cm (18 inches) into the soil, the standard penetration index ('N' Value) is the total number of blows for the last 30 cm (12 inches).

Dynamic Cone Penetration Resistance (DCPT): Dynamic Cone Penetration Resistance is similar to a SPT with the 474.5 Joule/blow impulse provided by the free falling hammer where the split-spoon sampler is replaced by a 51 mm Ø, 60° conical point and the number of blows is recorded continuously for every 30 cm (12 inches).

COHESIVE SOILS CONSISTENCY

	(kPa)	(P.S.F.)	Nominal 'N' Value
Very Soft	<12	<250	0-2
Soft	12-25	250-500	2-4
Firm	25-50	500-1000	4-8
Stiff	50-100	1000-2000	8-15
Very Stiff	100-200	2000-4000	15-30
Hard	>200	>4000	>30

RELATIVE DENSITY OF COHESIONLESS SOIL

	'N' Value
Very Loose	0-4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

MOISTURE CONDITIONS:

Cohesive Soil
DTPL- Drier than plastic limit
APL- About plastic limit
WTPL- Wetter than plastic limit
MWTPL- Much wetter than plastic limit

Cohesionless Soil
Damp
Moist
Wet
Saturated

SAMPLE TYPES AND ADDITIONAL FIELD TESTS

SS	Split Spoon Sample (obtained from SPT)	GS	Grab Sample	PP	Pocket Penetrometer
AS	Auger Sample	BS	Bulk Sample	VANE	Peak & Remolded shear
		TW	Thin Wall Sample or Shelby Tube	DMT	Flat Plate Dilatometer

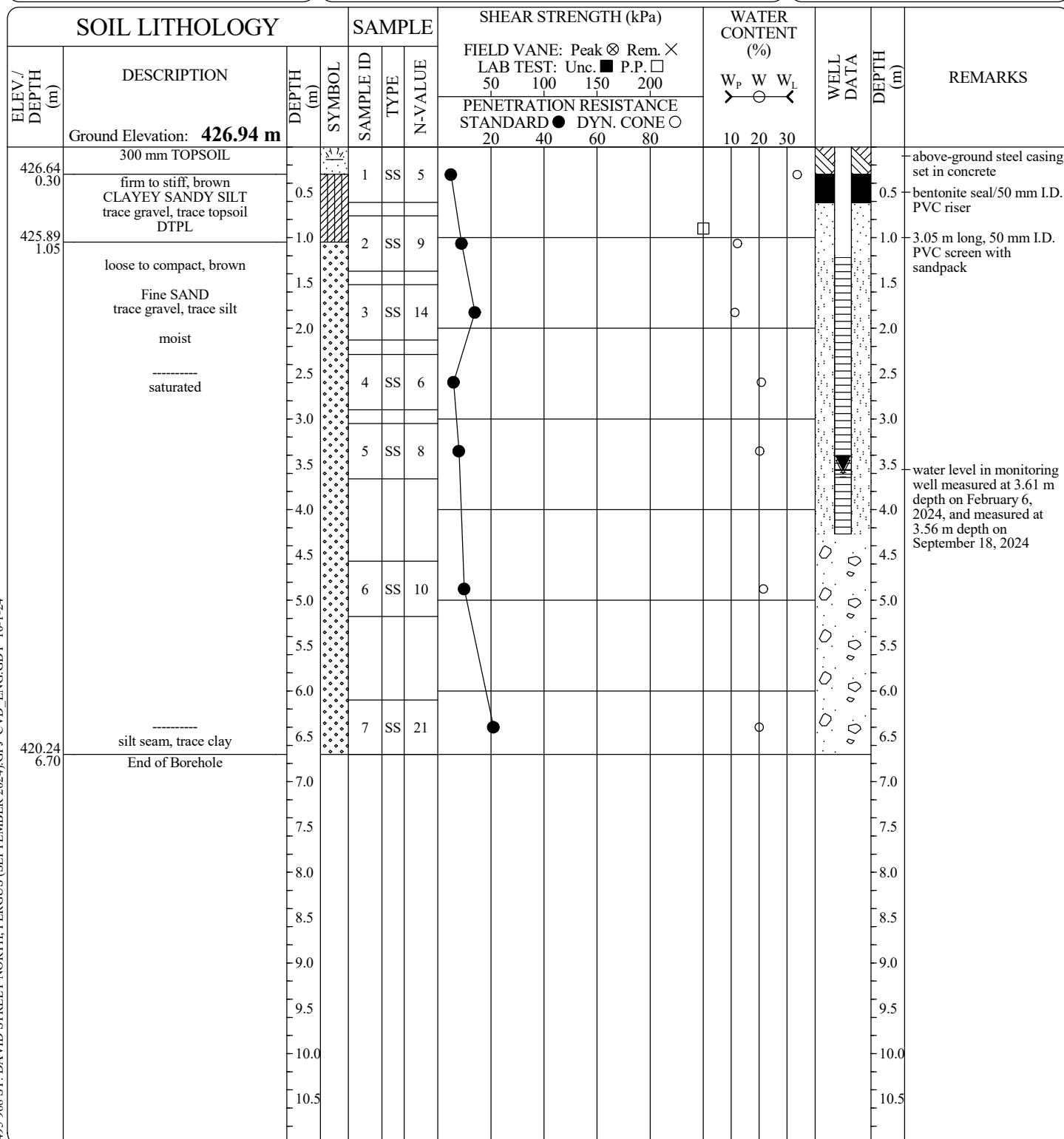
LABORATORY TESTS

SG	Specific Gravity	S	Sieve Analysis	W	Water Content
H	Hydrometer	P	Field Permeability	K	Lab Permeability
W_p	Plastic Limit	W_l	Liquid Limit	I_p	Plasticity Index
GSA	Grain Size Analysis	C	Consolidation	UNC	Unconfined compression



CHUNG & VANDER DOELEN
ENGINEERING LTD.

Enclosure A

FILE No: 1495**BOREHOLE No. 4**Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus, Ontario****EQUIPMENT DATA**Machine: **CME-55 Track**Method: **Solid Stem Auger**Size: **152 mm O.D.**Date: **Jan 16 - 24 TO Jan 16 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 5

Enclosure No.: 5

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Jan 16 - 24 TO Jan 16 - 24**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. ×				LAB TEST: Unc. ■ P.P. □					
							50 100 150 200				PENETRATION RESISTANCE					
							STANDARD ● DYN. CONE ○				W _p W W _L					
							20 40 60 80				10 20 30					
425.43 0.18	180 mm TOPSOIL			1	SS	5	●						○			above-ground steel casing set in concrete
	loose, orangey brown	0.5														bentonite seal/50 mm I.D. PVC riser
	SANDY SILT	1.0		2	SS	4	●							○		3.05 m long, 50 mm I.D. PVC screen with sandpack
	trace topsoil	1.5														
	moist to wet	2.0		3	SS	5	●							○		
423.76 1.85	loose to compact, brown	2.5														
	Fine SAND	3.0		4	SS	7	●							○		
	trace silt	3.5														
	wet to saturated	4.0		5	SS	9	●							○		
		4.5														
		5.0		6	SS	9	●							○		
		5.5														
		6.0														
		6.5		7	SS	12	●							○		
		7.0														
		7.5														
		8.0		8	SS	13	●							○		
417.36 8.25	silt seam, trace clay	8.5														
	End of Borehole	9.0														
		9.5														
		10.0														
		10.5														

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 6



Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus, Ontario**

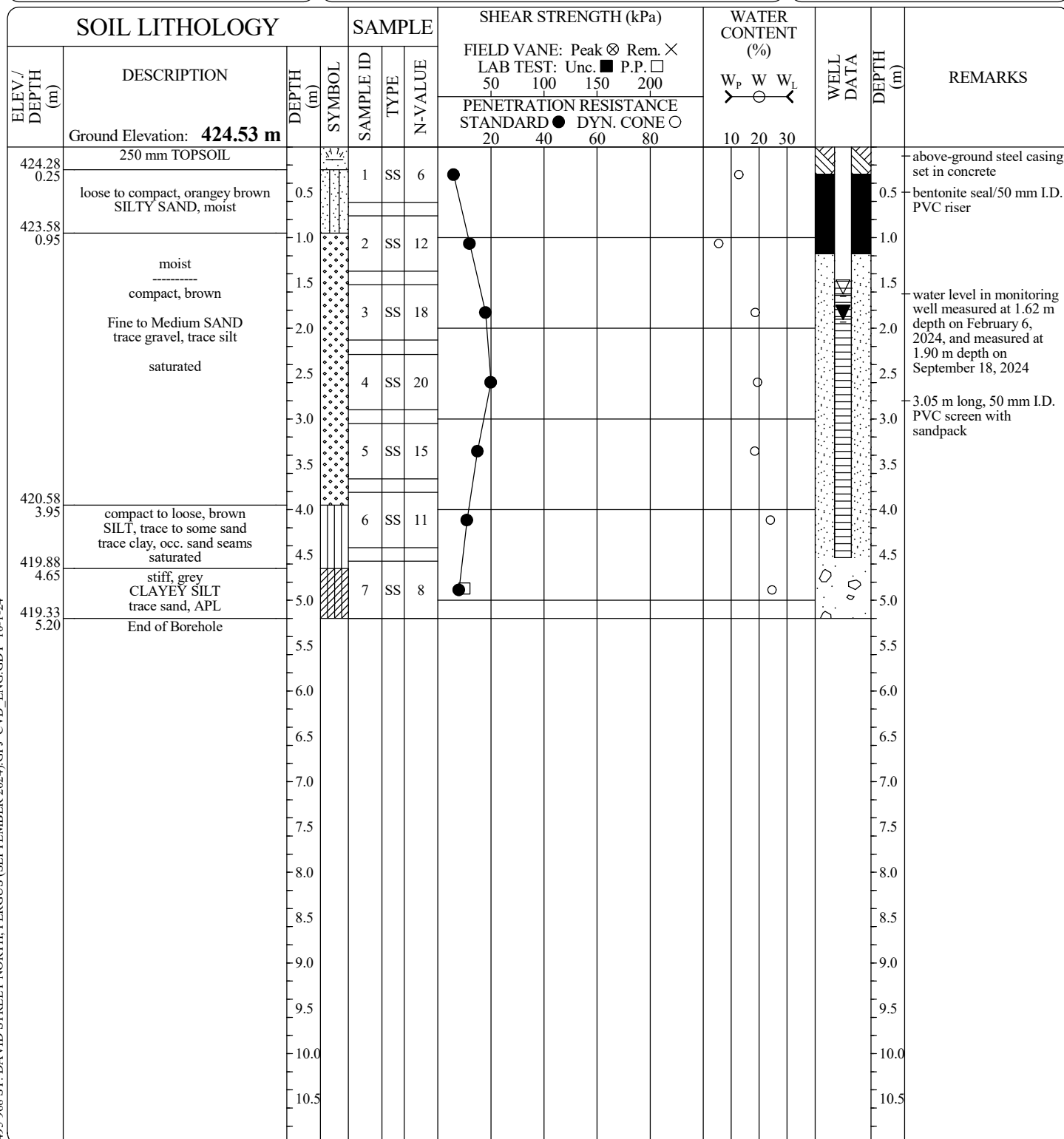
EQUIPMENT DATA

Machine: **CME-55 Track**

Method: **Hollow Stem Auger**

Size: **83 mm I.D.**

Date: **Jan 15 - 24 TO Jan 15 - 24**



PROJECT MANAGER: **EYC**

**CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 7

Enclosure No.: 7

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Jan 15 - 24 TO Jan 15 - 24**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □				Wp W WL					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○									
	Ground Elevation: 421.82 m						20	40	60	80	10	20	30			
421.59 0.23	230 mm TOPSOIL	0.5		1	SS	3	●					○			0.5	above-ground steel casing set in concrete; bentonite seal/ 50 mm I.D. PVC riser water level in monitoring well measured at 0.41 m depth on February 6, 2024, and measured at 1.14 m depth on September 18, 2024
420.92 0.90	very loose to compact, brown SANDY SILT, trace gravel trace topsoil, wet to saturated	1.0		2	SS	11	●					○			1.0	
419.97 1.85	compact, brown Fine SAND trace gravel, trace silt saturated	1.5		3	SS	12	●					○			1.5	
	stiff to hard, grey CLAYEY SANDY SILT DTPL	2.0		4	SS	50	●				□	○			2.0	
		2.5													2.5	
		3.0													3.0	
3.5		3.5														
416.62 5.20		4.0		5	SS	53	●				□	○			4.0	
		4.5													4.5	
		5.0													5.0	
		5.20													5.20	
	End of Borehole	5.5													5.5	
		6.0													6.0	
		6.5													6.5	
		7.0													7.0	
		7.5													7.5	
		8.0													8.0	
		8.5													8.5	
		9.0													9.0	
		9.5													9.5	
		10.0													10.0	
		10.5													10.5	

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 8

Enclosure No.: 8

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

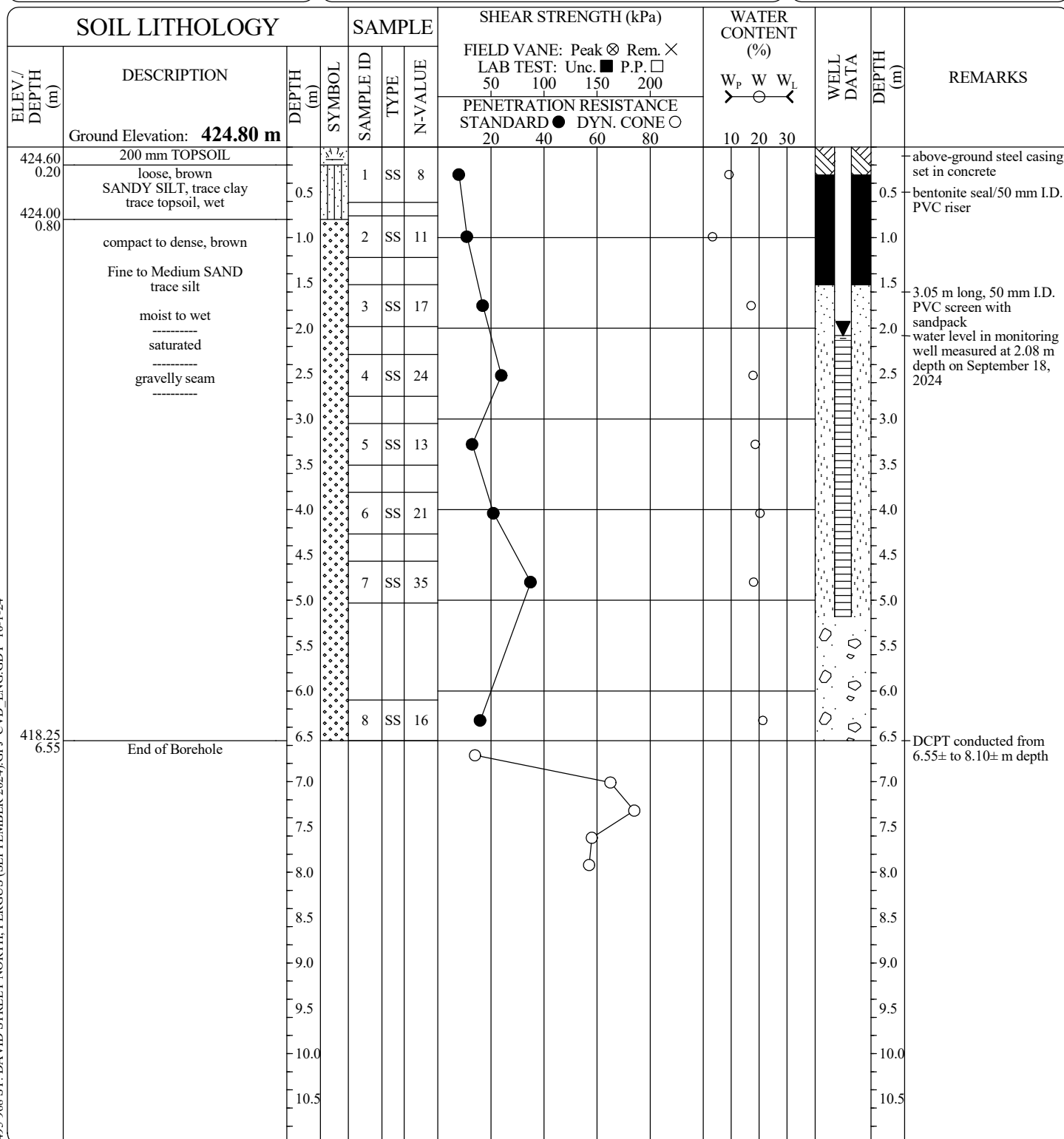
EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Jan 15 - 24 TO Jan 15 - 24**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS			
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. ×				LAB TEST: Unc. ■ P.P. □						W _P W W _L		
							PENETRATION RESISTANCE				STANDARD ● DYN. CONE ○								
							20	40	60	80	10	20	30						
Ground Elevation: 421.01 m																			
420.71 0.30	300 mm TOPSOIL			1	SS	10	●						○			above-ground steel casing set in concrete; bentonite seal/ 50 mm I.D. PVC riser water level in monitoring well measured at 0.44 m depth on February 6, 2024, and measured at 0.73 m depth on September 18, 2024			
419.96 1.05	compact, brown SILTY SAND, trace gravel moist to wet	0.5													0.5				
	compact to very dense, brown Fine to Medium SAND trace gravel, trace silt occ. clay seams saturated	1.0		2	SS	11	●						○		1.0				
1.5														1.5					
2.0													○		2.0				
418.61 2.40	hard to very stiff, grey CLAYEY SILT some sand trace gravel occ. silt seams DTPL	2.5		4	SS	51						□	○		2.5				
		3.0													3.0				
		3.5		5	SS	31	●					□	○		3.5				
		4.0													4.0				
415.81 5.20	End of Borehole	4.5													4.5				
		5.0		6	SS	21	●					□	○		5.0				
		5.5													5.5				
		6.0													6.0				
		6.5													6.5				
		7.0													7.0				
		7.5													7.5				
		8.0													8.0				
		8.5													8.5				
		9.0													9.0				
9.5													9.5						
10.0													10.0						
10.5													10.5						

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495**BOREHOLE No. 106**Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus, Ontario****EQUIPMENT DATA**Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 09 - 24 TO Sep 09 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

BOREHOLE No. 107

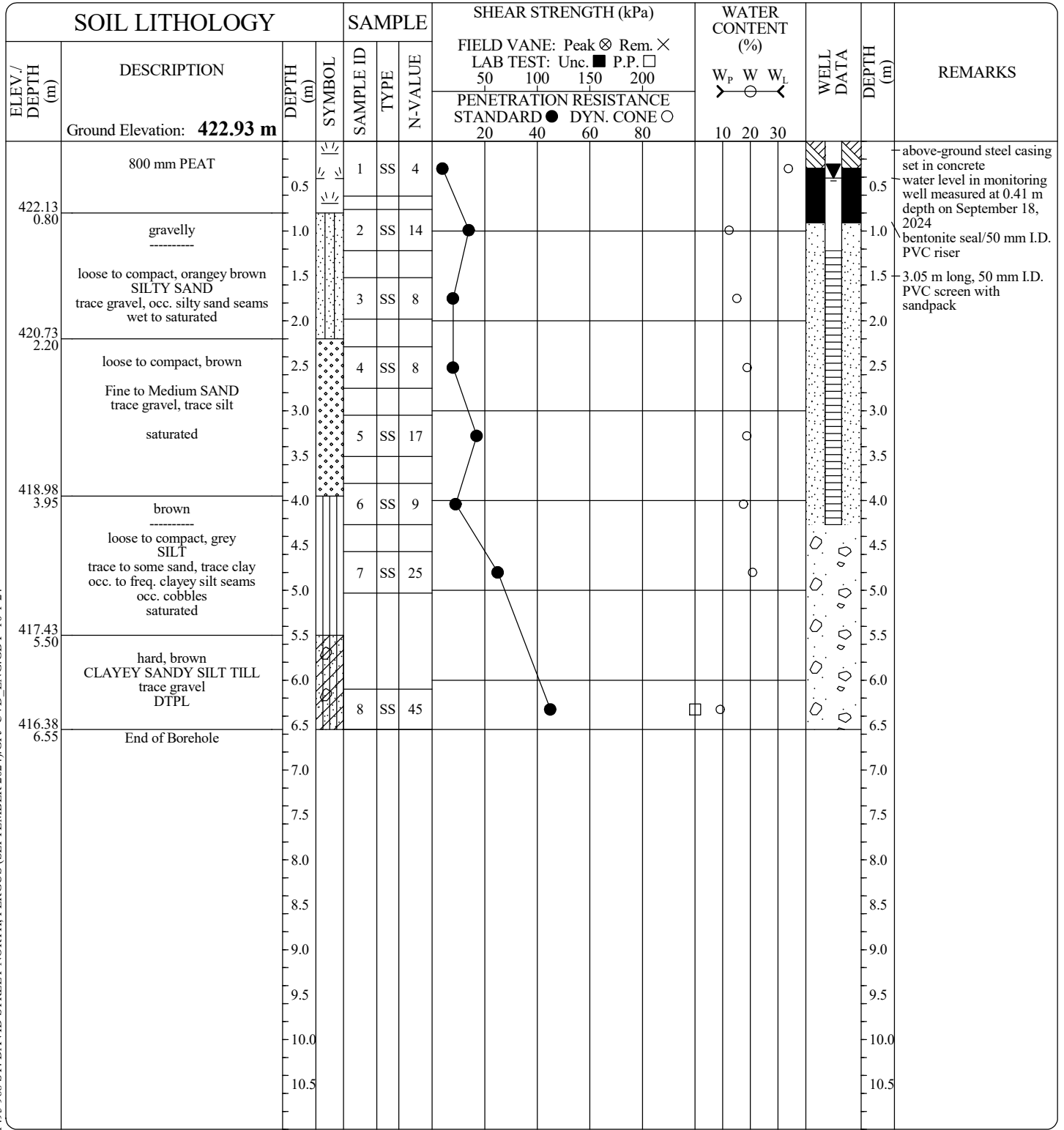
Enclosure No.: 15

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 09 - 24 TO Sep 09 - 24**

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024) GPJ CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 108

Enclosure No.: 16

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 09 - 24 TO Sep 09 - 24**

SOIL LITHOLOGY			SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS	
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. × LAB TEST: Unc. ■ P.P. □				WATER CONTENT (%) W _p W W _L					
							PENETRATION RESISTANCE STANDARD ● DYN. CONE ○									
	Ground Elevation: 424.74 m						20	40	60	80	10	20	30			
424.49 0.25	250 mm TOPSOIL			1	SS	5	●					○				above-ground steel casing set in concrete
	loose to compact, brown SANDY SILT occ. clay silt seams moist	0.5													0.5	bentonite seal/50 mm I.D. PVC riser
		1.0		2	SS	14	●					○			1.0	
423.39 1.35	loose to compact, brown Fine to Medium SAND trace gravel, trace silt wet to saturated	1.5													1.5	
		2.0		3	SS	14	●					○			2.0	water level in monitoring well measured at 1.83 m depth on September 18, 2024
		2.5													2.5	
		3.0		4	SS	12	●					○			3.0	
		3.5													3.5	
		4.0		5	SS	10	●					○			4.0	
		4.5													4.5	
419.99 4.75	loose to compact, brown SILT trace sand, trace clay occ. clayey silt seams saturated grey	5.0		6	SS	9	●					○			5.0	
		5.5													5.5	
		6.0													6.0	
418.19 6.55	End of Borehole	6.5		7	SS	14	●					○			6.5	
		7.0													7.0	
		7.5													7.5	
		8.0													8.0	
		8.5													8.5	
		9.0													9.0	
		9.5													9.5	
		10.0													10.0	
		10.5													10.5	

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ_CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 109

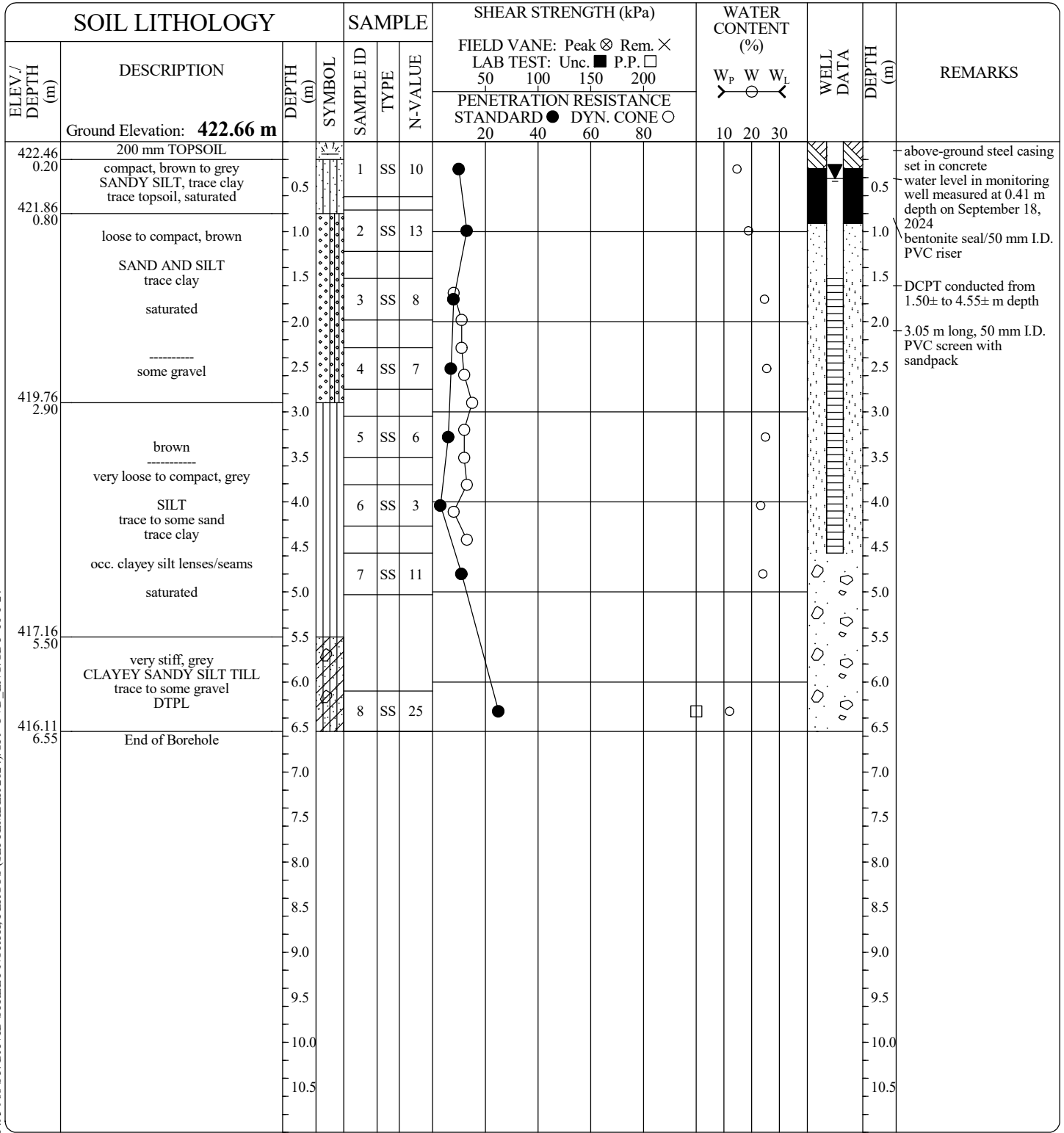
Enclosure No.: 17

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 09 - 24 TO Sep 09 - 24**

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024) GPJ_CVD_ENG.GDT 10-1-24

FILE No: 1495

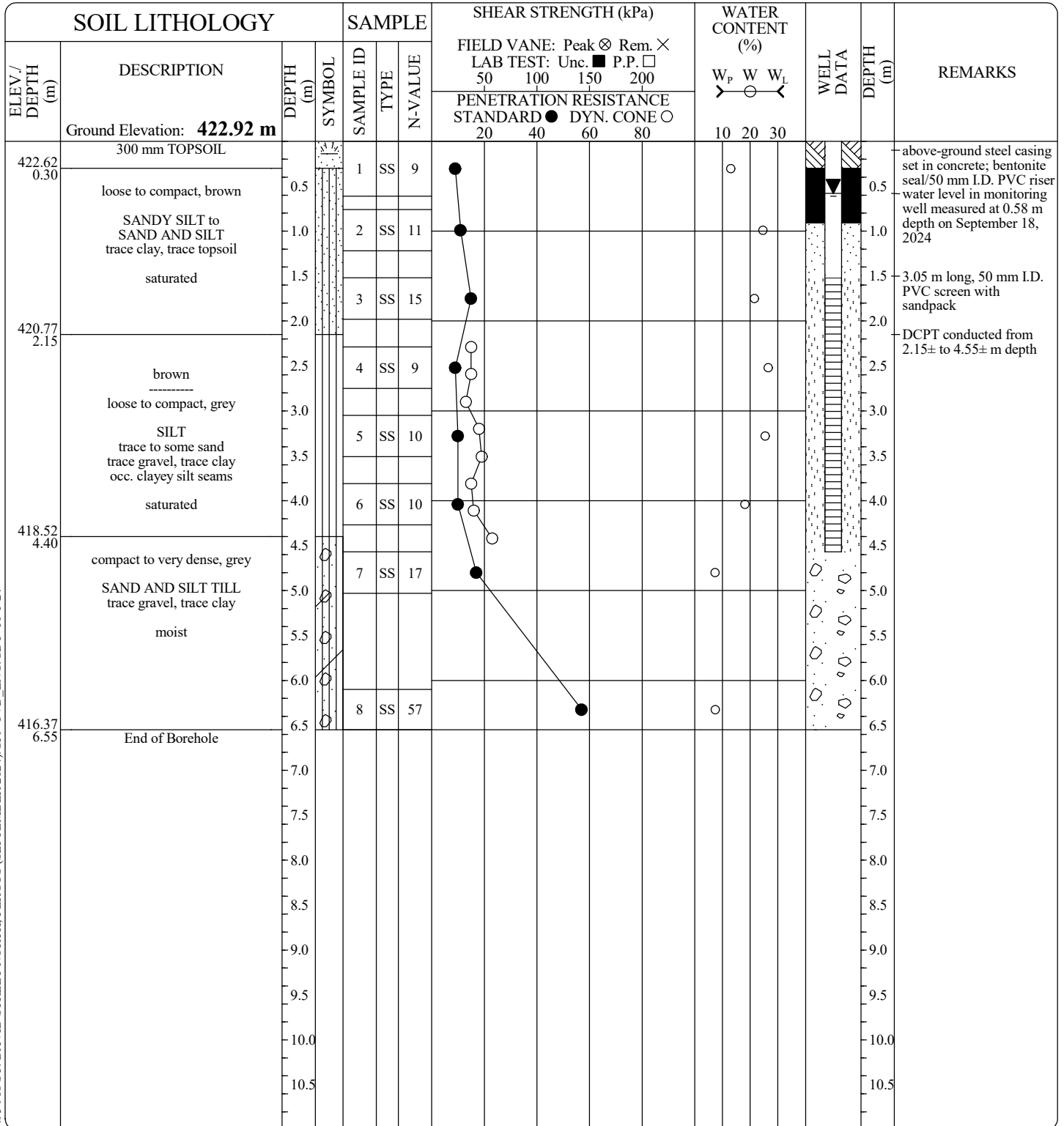
BOREHOLE No. 110

Enclosure No.: 18

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 10 - 24 TO Sep 10 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ_CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 111

Enclosure No.: 19

Sheet 1 of 1

Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 10 - 24 TO Sep 10 - 24**

SOIL LITHOLOGY				SAMPLE			SHEAR STRENGTH (kPa)				WATER CONTENT (%)			WELL DATA	DEPTH (m)	REMARKS
ELEV./ DEPTH (m)	DESCRIPTION	DEPTH (m)	SYMBOL	SAMPLE ID	TYPE	N-VALUE	FIELD VANE: Peak ⊗ Rem. ×				W _p W W _L					
							LAB TEST: Unc. ■ P.P. □				↔ ○ ↔					
							PENETRATION RESISTANCE									
							STANDARD ● DYN. CONE ○									
	Ground Elevation: 421.24 m						20	40	60	80	10	20	30			
420.94 0.30	300 mm TOPSOIL			1	SS	10										above-ground steel casing set in concrete; bentonite seal/50 mm I.D. PVC riser
	compact, orangey brown SANDY SILT trace gravel, trace clay moist	0.5														
419.89 1.35	stiff, brown CLAYEY SILT, trace gravel trace sand, occ. silt seams DTPL	1.0		2	SS	15										water level in monitoring well measured at 0.67 m depth on September 18, 2024
		1.5														
419.09 2.15	compact, brown Fine to Medium SAND trace to some gravel trace silt saturated	2.0		3	SS	12										3.05 m long, 50 mm I.D. PVC screen with sandpack
		2.5														
		3.0														
417.89 3.35	brown silt seam	3.5		5	SS	12										
	stiff to hard, grey	4.0														
	CLAYEY SANDY SILT TILL trace to some gravel trace sand	4.5		6	SS	23										
		5.0														
	occ. silt lenses	5.5		7	SS	25										
	DTPL	6.0														
		6.5		8	SS	35										
414.69 6.55	End of Borehole	6.5														
		7.0														
		7.5														
		8.0														
		8.5														
		9.0														
		9.5														
		10.0														
		10.5														

PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ_CVD_ENG.GDT 10-1-24

FILE No: 1495

BOREHOLE No. 112



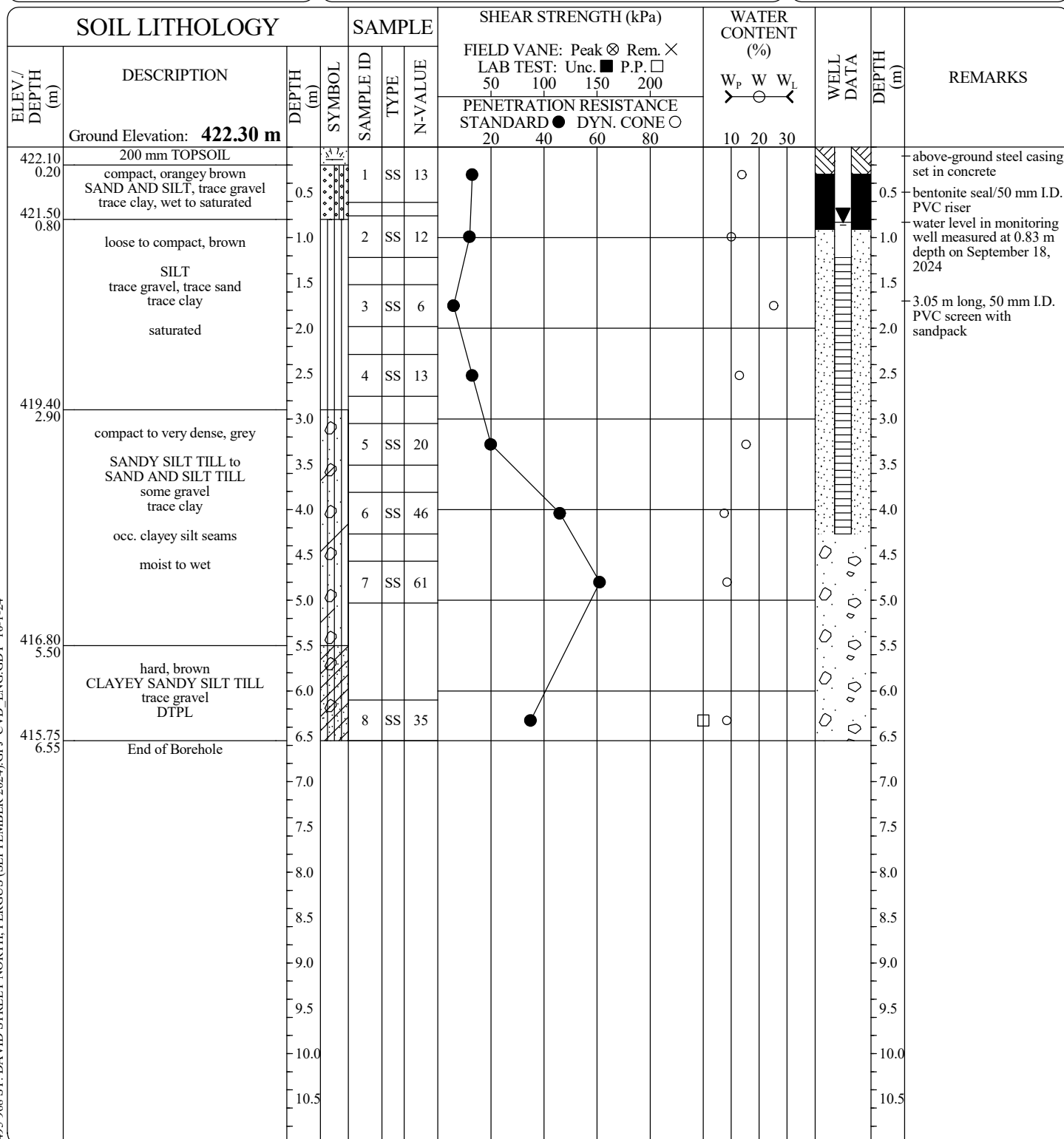
Client: **PoloCorp Inc.**

Project: **Proposed Residential Subdivision**

Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

Machine: **CME-55 Track**
Method: **Hollow Stem Auger**
Size: **83 mm I.D.**
Date: **Sep 10 - 24 TO Sep 10 - 24**



PROJECT MANAGER: **EYC**

**CHUNG & VANDER DOELEN
ENGINEERING LTD.**

311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

FILE No: 1495

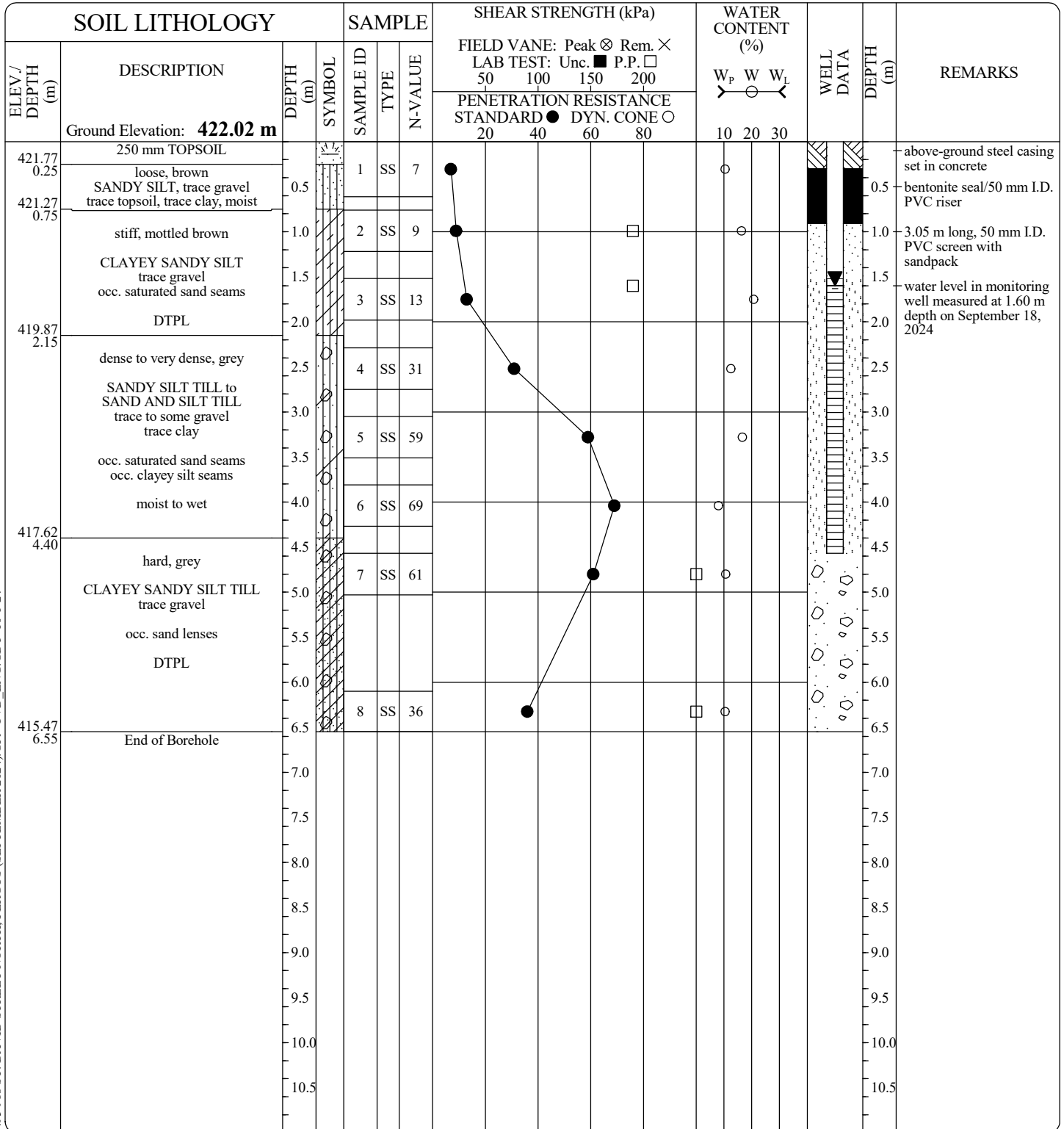
BOREHOLE No. 113

Enclosure No.: 21

Sheet 1 of 1

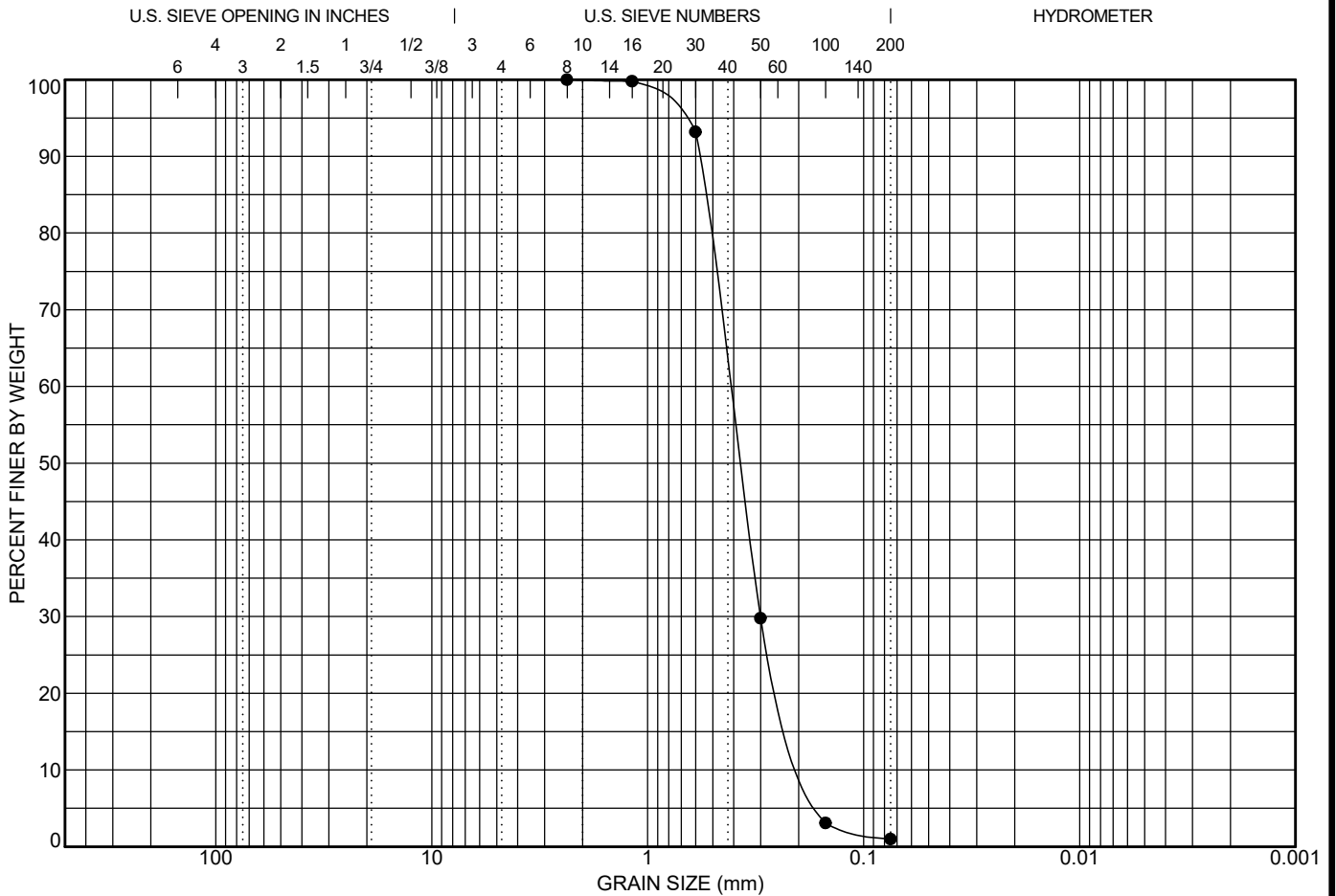
Client: **PoloCorp Inc.**Project: **Proposed Residential Subdivision**Location: **968 St. David Street North, Fergus,
Ontario**

EQUIPMENT DATA

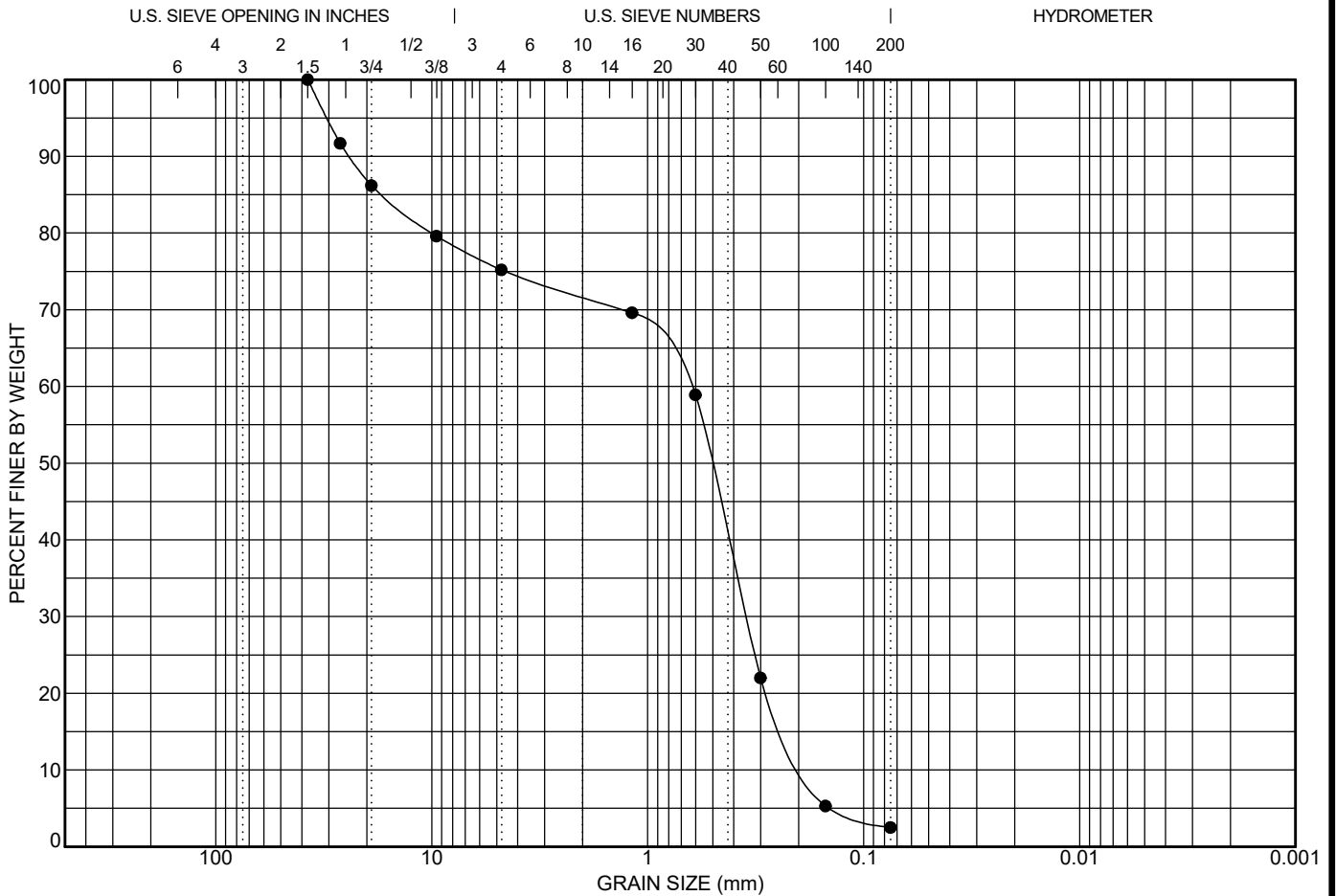
Machine: **CME-55 Track**Method: **Hollow Stem Auger**Size: **83 mm I.D.**Date: **Sep 10 - 24 TO Sep 10 - 24**PROJECT MANAGER: **EYC****CHUNG & VANDER DOELEN
ENGINEERING LTD.**311 Victoria Street North
Kitchener, Ontario N2H 5E1
ph. (519) 742-8979, fx. (519) 742-7739

CVD BOREHOLE (2017) 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024).GPJ_CVD_ENG.GDT 10-1-24

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.04	3.53	37.5	0.643	0.349	0.182	24.8	72.7	2.5	

Date: Sep. 25 - 2024		Sieve Size (mm)	Percent Passing	No Specifications
Client: PoloCorp Inc.				
Contractor:				
Source:				
Sampled From: BH 108 - SA 4, 2.30 to 2.75 m depth				
Sample No.: 108-4				
Date Sampled: Sep. 09 - 2024				
Sampled By: RS				
Lab No.: 1038				
Date Tested: Sep. 25 - 2024				
Type of Material: Gravelly Sand, trace silt				



CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

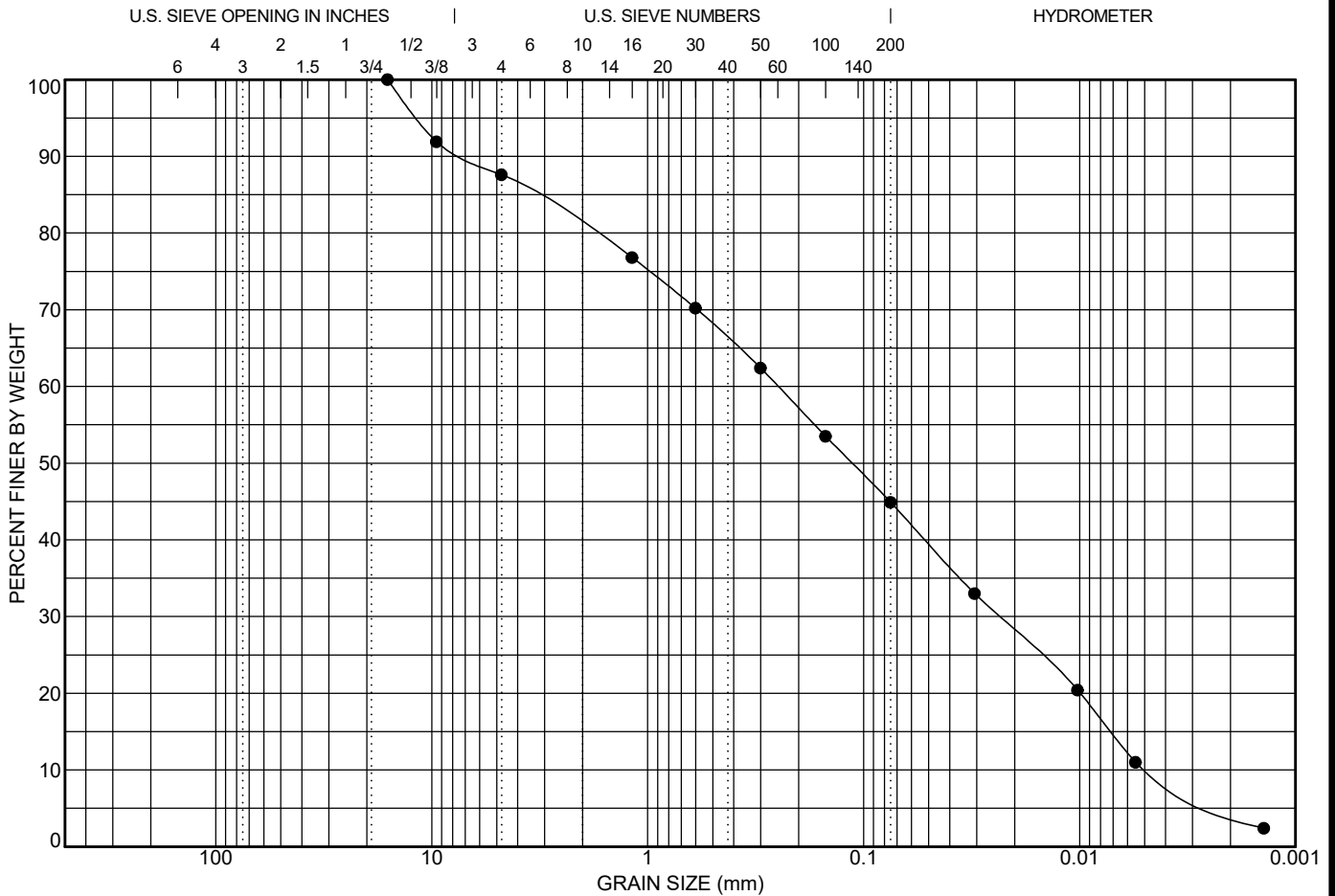
Project: Proposed Residential Subdivision

Location: 968 St. David Street North, Fergus, Ontario

File No.: 1495

Enclosure No.: 25

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			0.48	53.05	16	0.249	0.024	0.005	12.4	42.7	44.9	

Date: Sep. 25 - 2024		Sieve Size (mm)	Percent Passing	No Specifications
Client: PoloCorp Inc.				
Contractor:				
Source:				
Sampled From: BH 109 - SA 4, 2.30 to 2.75 m depth				
Sample No.: 109-4				
Date Sampled: Sep. 09 - 2024				
Sampled By: RS				
Lab No.: 1037				
Date Tested: Sep. 25 - 2024				
Type of Material: Sand and Silt, some gravel, trace clay				



CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

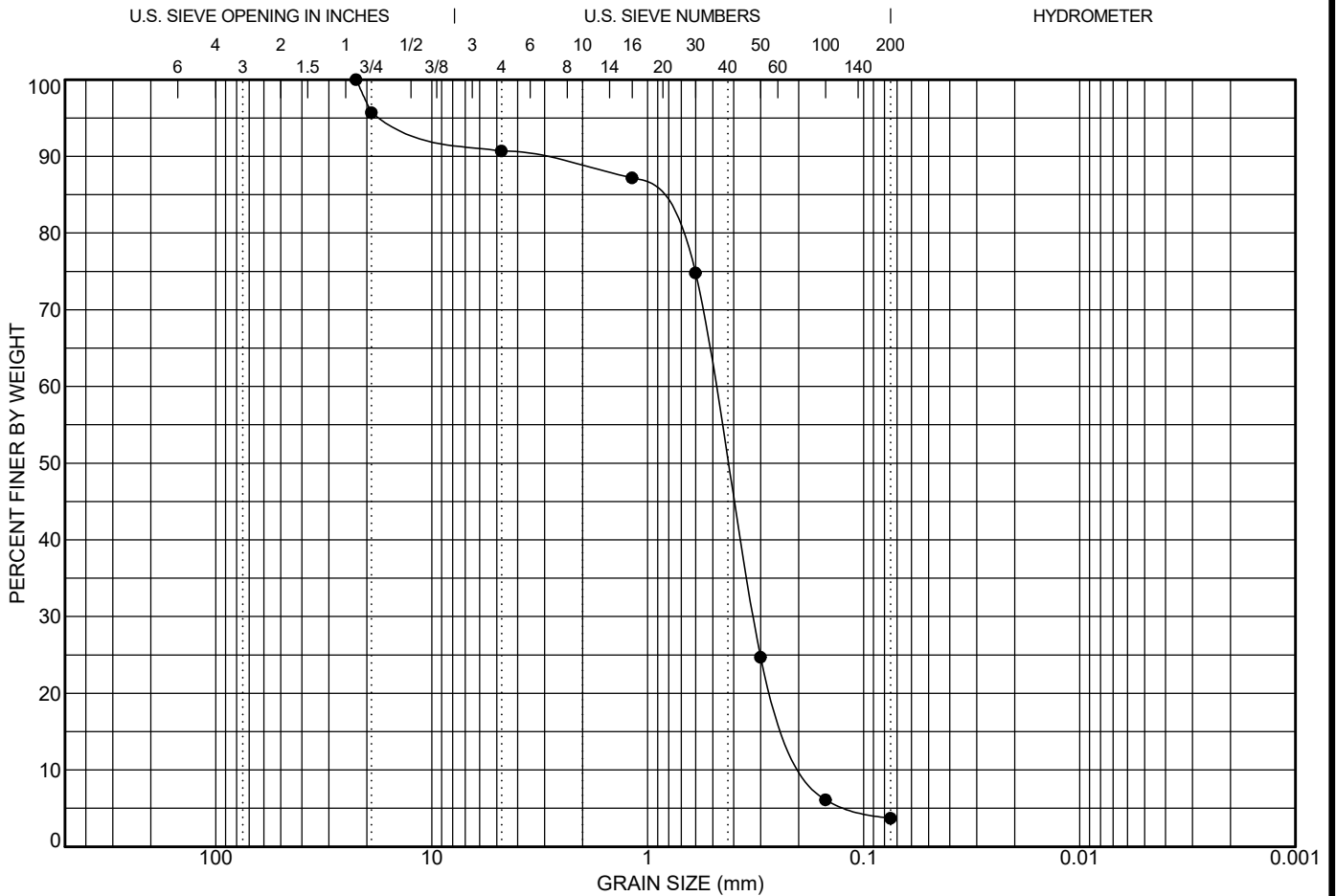
Project: Proposed Residential Subdivision

Location: 968 St. David Street North, Fergus, Ontario

File No.: 1495

Enclosure No.: 26

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.23	2.82	22.4	0.489	0.323	0.173	9.3	87.0	3.7	

Date:	Sep. 25 - 2024	Sieve Size (mm)	Percent Passing	No Specifications
Client:	PoloCorp Inc.			
Contractor:				
Source:				
Sampled From:	BH 111 - SA 4, 2.30 to 2.75 m depth			
Sample No.:	111-4			
Date Sampled:	Sep. 10 - 2024			
Sampled By:	RS			
Lab No.:	1036			
Date Tested:	Sep. 25 - 2024			
Type of Material:	Fine to Medium Sand, trace gravel, trace silt			



CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

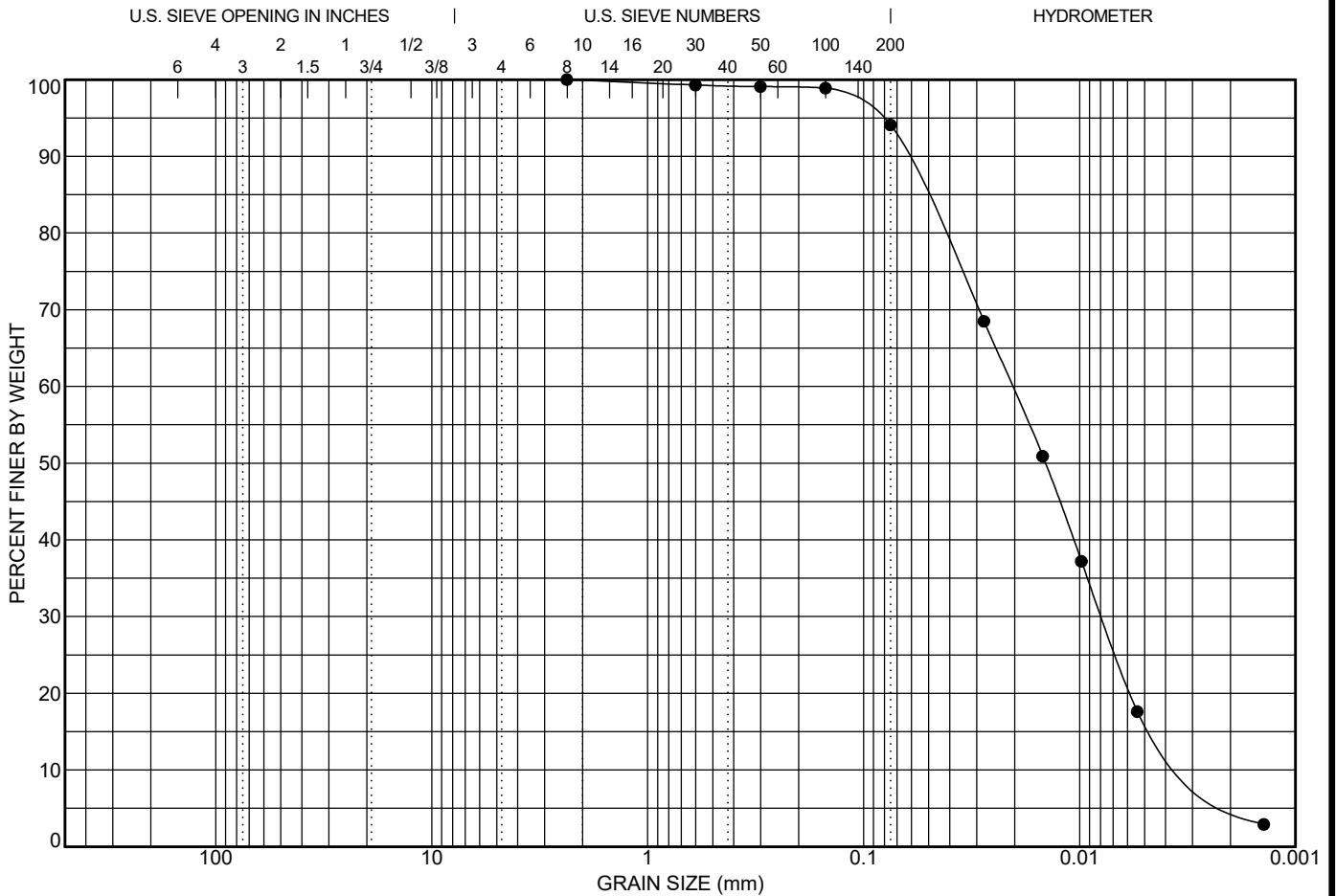
Project: Proposed Residential Subdivision

Location: 968 St. David Street North, Fergus, Ontario

File No.: 1495

Enclosure No.: 27

DM - NO SPECIFICATIONS 1495 968 ST. DAVID STREET NORTH, FERGUS (SEPTEMBER 2024), GPJ LAW LNDN.GDT 10-1-24



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

LL	PL	PI	Cc	Cu	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
			1.13	7.62	2.36	0.02	0.008	0.003	0.0	5.9	94.1	

Date: Sep. 25 - 2024		Sieve Size (mm)	Percent Passing	No Specifications
Client: PoloCorp Inc.				
Contractor:				
Source:				
Sampled From: BH 112 - SA 4, 2.30 to 2.75 m depth				
Sample No.: 112-4				
Date Sampled: Sep. 10 - 2024				
Sampled By: RS				
Lab No.: 1039				
Date Tested: Sep. 25 - 2024				
Type of Material: Silt, trace sand, trace clay				

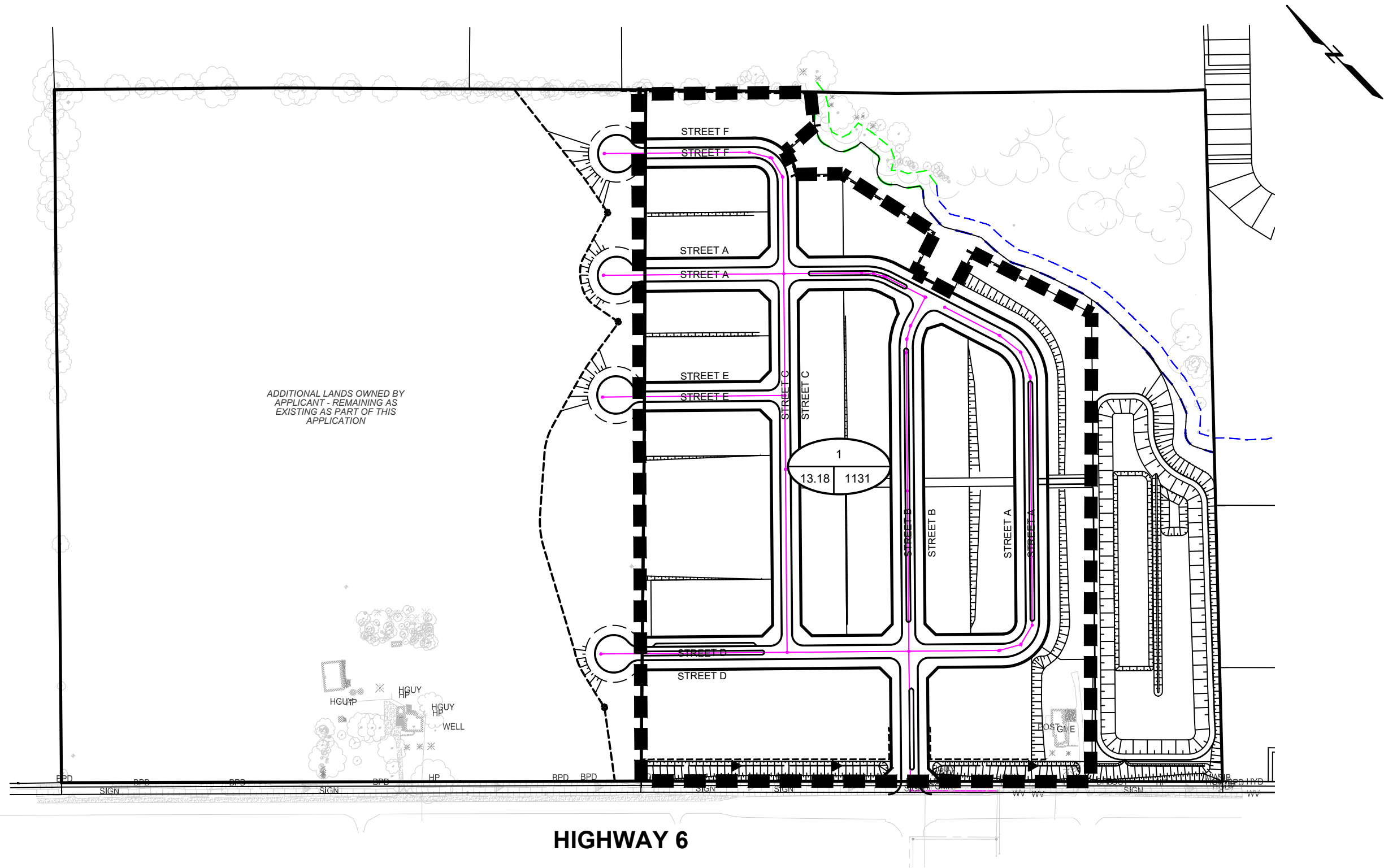


CHUNG & VANDER DOELEN
ENGINEERING LTD.
311 Victoria Street North
Kitchener, Ontario N2H 5E1
Telephone: 519-742-8979
Fax: 519-742-7739
e-mail: info@cvdengineering.com

GRAIN SIZE DISTRIBUTION

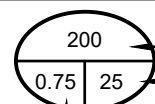
Project: Proposed Residential Subdivision
Location: 968 St. David Street North, Fergus, Ontario
File No.: 1495
Enclosure No.: 28

Appendix B Sewer Design Sheets



LEGEND

■ ■ ■ ■ CATCHMENT BOUNDARY



— CATCHMENT NUMBER

— POPULATION

— CATCHMENT AREA
IN HECTARES

FERGUS SUBDIVISION - SOUTH LANDS
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)

POLOCORP



Project 2401807

CONCEPTUAL SANITARY
SEWER CATCHMENT AREAS

FEBRUARY 2025

q = average daily per capita flow (350 L/cap.d)
 I = unit of peak extraneous flow (0.15 L/ha/s)
 A = Tributary area in gross hectares
 M = Peaking factor
 Q(p) = peak population flow (L/s)
 Q(i) = peak extraneous flow (L/s)
 Q(d) = peak design flow

PRELIMINARY SANITARY SEWER DESIGN

TOWNSHIP OF CENTRE WELLINGTON (FERGUS)

North Lands Subdivision

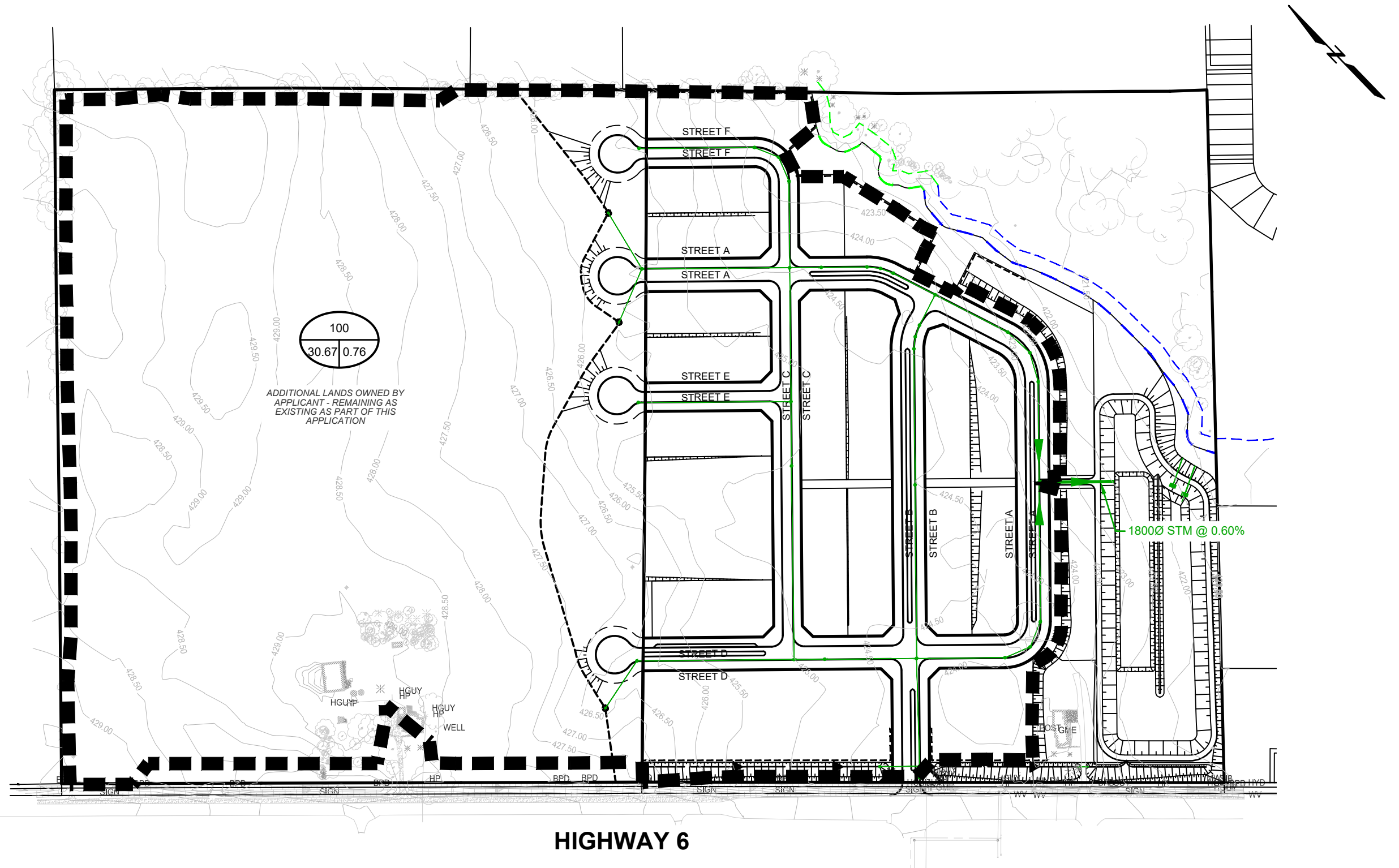
$M = 1 + \frac{14}{4 + (P)^{1/2}}$ where P is population in 1000's
 $Q(p) = \frac{PqM}{86.4}$ (L/s)
 $Q(i) = IA$
 $Q(d) = Q(p) + Q(i)$ (L/s)

February 10, 2025

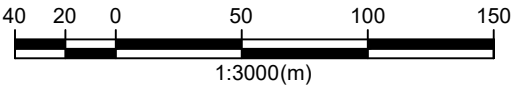
Designed By: BL

Checked By:

Location		Individual Population	Cumulative Population	Individual Area (ha)	Cumulative Area	Peaking Factor (M)	Pop. Flow Q(p) (L/s)	Peak Extraneous Flow Q(i) (L/s)	Peak Design Flow Q(d) (m3/s)						
From	To									Pipe Size (mm)	Type of Pipe	Grade %	Capacity (m³/s)	Full Flow Velocity (m/s)	Actual velocity at Q(d)
Catchment 1	Highway 6 Ex. Sanitary	1131	1131	13.81	13.81	3.765	17.24	2.072	0.0193	300	0.013	0.60	0.075	1.060	0.883

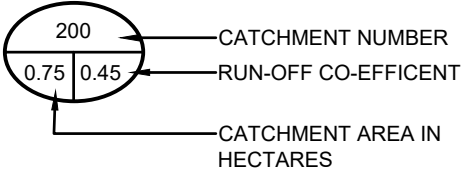


HIGHWAY 6



LEGEND

■ ■ ■ ■ CATCHMENT BOUNDARY



FERGUS SUBDIVISION - SOUTH LANDS
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)

POLOCORP



Project 2401807

CONCEPTUAL STORM
SEWER CATCHMENT AREAS

FEBRUARY 2025

PRELIMINARY STORM SEWER DESIGN

5 Year Design

TOWNSHIP OF CENTRE WELLINGTON (FERGUS)

North Lands Subdivision

Fergus Shand Dam IDF Curves

A = 544.711

B = 0.0206

C = 0.686

Intensity = $A / (t + B)^C$

$Q = CiA$ (m³/s)

February 4, 2025

Designed By: BL

Checked By: PW

Location	Area (ha)	Runoff Coefficient	A x C	Cumulative A x C	Time of Conc. (min.)	Intensity (mm/hr)	Flow (m ³ /s)	Proposed Sewer						
Catchment Area								Length (m)	Pipe Size (mm)	Type of Pipe	Grade %	Capacity (m ³ /s)	Full Flow Velocity (m/s)	Time of Flow (min.)
100 Inlet to SWM Pond	30.67	0.76	23.31	23.31	10.00	112.09	7.257	53.0	1800	0.013	0.60	8.90	3.50	0.25

Appendix C Stormwater Management Analysis

C.1. Existing Conditions Modelling

C.2. Interim Post-Development Conditions Modelling

C.3. Ultimate Post-Development Conditions Modelling

C.1. Existing Conditions Modelling

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Ex__25mm.out"
"          Licensee name:                      "
"          Company                      "
"          Date & Time last used:                2/1/2025 at 9:55:06 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          367.000  Coefficient A"
"          5.000  Constant B"
"          0.700  Exponent C"
"          0.394  Fraction R"
"          120.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          72.993  mm/hr"
"          Total depth          24.995  mm"
"          7  0025hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 10"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          10  Catchment 10"
"          2.000  % Impervious"
"          31.110  Total Area"
"          200.000  Flow length"
"          3.750  Overland Slope"
"          30.488  Pervious Area"
"          200.000  Pervious length"
"          3.750  Pervious slope"
"          0.622  Impervious Area"
"          200.000  Impervious length"
"          3.750  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```


"	1.500	Impervious Depression storage"				
"		0.436	0.000	0.000	0.000 c.m/sec"	
"		Catchment 10	Pervious	Impervious	Total Area	"
"		Surface Area	30.488	0.622	31.110	hectare"
"		Time of concentration	53.937	6.504	50.503	minutes"
"		Time to Centroid	118.211	68.506	114.611	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	7620.53	155.52	7776.05	c.m"
"		Rainfall losses	18.911	1.722	18.568	mm"
"		Runoff depth	6.084	23.273	6.428	mm"
"		Runoff volume	1854.87	144.81	1999.67	c.m"
"		Runoff coefficient	0.243	0.931	0.257	"
"		Maximum flow	0.423	0.099	0.436	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.436	0.436	0.000	0.000"	
" 33		CATCHMENT 40"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	40	Catchment 40"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.056	0.436	0.000	0.000 c.m/sec"	
"		Catchment 40	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	42.448	5.118	42.448	minutes"
"		Time to Centroid	105.920	66.672	105.919	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	832.34	0.00	832.34	c.m"
"		Rainfall losses	18.910	1.665	18.910	mm"
"		Runoff depth	6.085	23.330	6.085	mm"

"	Runoff volume	202.64	0.00	202.64	c.m"
"	Runoff coefficient	0.243	0.000	0.243	"
"	Maximum flow	0.056	0.000	0.056	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.056	0.489	0.000	0.000"	
" 33	CATCHMENT 30"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	30 Catchment 30"				
"	5.000 % Impervious"				
"	2.000 Total Area"				
"	40.000 Flow length"				
"	3.750 Overland Slope"				
"	1.900 Pervious Area"				
"	40.000 Pervious length"				
"	3.750 Pervious slope"				
"	0.100 Impervious Area"				
"	40.000 Impervious length"				
"	3.750 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.058	0.489	0.000	0.000 c.m/sec"	
"	Catchment 30	Pervious	Impervious	Total Area	"
"	Surface Area	1.900	0.100	2.000	hectare"
"	Time of concentration	20.536	2.476	17.532	minutes"
"	Time to Centroid	82.465	63.135	79.250	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	474.91	25.00	499.91	c.m"
"	Rainfall losses	18.914	1.941	18.065	mm"
"	Runoff depth	6.082	23.054	6.930	mm"
"	Runoff volume	115.55	23.05	138.61	c.m"
"	Runoff coefficient	0.243	0.922	0.277	"
"	Maximum flow	0.055	0.016	0.058	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.058	0.514	0.000	0.000"	
" 33	CATCHMENT 20"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	20	Catchment 20"			
"	0.000	% Impervious"			
"	2.980	Total Area"			
"	80.000	Flow length"			
"	1.250	Overland Slope"			
"	2.980	Pervious Area"			
"	80.000	Pervious length"			
"	1.250	Pervious slope"			
"	0.000	Impervious Area"			
"	80.000	Impervious length"			
"	1.250	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.049	0.514	0.000	0.000 c.m/sec"
"		Catchment 20	Pervious	Impervious	Total Area "
"		Surface Area	2.980	0.000	2.980 hectare"
"		Time of concentration	43.278	5.218	43.277 minutes"
"		Time to Centroid	106.800	66.808	106.800 minutes"
"		Rainfall depth	24.995	24.995	24.995 mm"
"		Rainfall volume	744.86	0.00	744.86 c.m"
"		Rainfall losses	18.910	1.642	18.910 mm"
"		Runoff depth	6.085	23.353	6.085 mm"
"		Runoff volume	181.33	0.00	181.33 c.m"
"		Runoff coefficient	0.243	0.000	0.243 "
"		Maximum flow	0.049	0.000	0.049 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.049	0.561	0.000	0.000"
" 38		START/RE-START TOTALS 20"			
"	3	Runoff Totals on EXIT"			
"		Total Catchment area		39.420	hectare"
"		Total Impervious area		0.722	hectare"
"		Total % impervious		1.832"	
" 19		EXIT"			

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\"
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Ex__2yr.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/1/2025 at 9:57:32 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          414.876  Coefficient A"
"          0.027  Constant B"
"          0.682  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          100.235  mm/hr"
"          Total depth          39.504  mm"
"          6  002hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 10"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          10  Catchment 10"
"          2.000  % Impervious"
"          31.110  Total Area"
"          200.000  Flow length"
"          3.750  Overland Slope"
"          30.488  Pervious Area"
"          200.000  Pervious length"
"          3.750  Pervious slope"
"          0.622  Impervious Area"
"          200.000  Impervious length"
"          3.750  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"			
"		1.519	0.000	0.000	0.000 c.m/sec"
"		Catchment 10	Pervious	Impervious	Total Area "
"		Surface Area	30.488	0.622	31.110 hectare"
"		Time of concentration	31.890	5.729	30.537 minutes"
"		Time to Centroid	144.180	120.327	142.946 minutes"
"		Rainfall depth	39.504	39.504	39.504 mm"
"		Rainfall volume	1.2044	0.0246	1.2290 ha-m"
"		Rainfall losses	25.393	1.789	24.921 mm"
"		Runoff depth	14.111	37.715	14.583 mm"
"		Runoff volume	4302.12	234.66	4536.78 c.m"
"		Runoff coefficient	0.357	0.955	0.369 "
"		Maximum flow	1.495	0.138	1.519 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		1.519	1.519	0.000	0.000"
" 33		CATCHMENT 40"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	40	Catchment 40"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			
"	3.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.193	1.519	0.000	0.000 c.m/sec"
"		Catchment 40	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	25.097	4.509	25.096 minutes"
"		Time to Centroid	135.157	118.349	135.157 minutes"
"		Rainfall depth	39.504	39.504	39.504 mm"
"		Rainfall volume	1315.48	0.00	1315.48 c.m"
"		Rainfall losses	25.393	1.692	25.393 mm"
"		Runoff depth	14.111	37.813	14.111 mm"

"	Runoff volume	469.88	0.00	469.89	c.m"
"	Runoff coefficient	0.357	0.000	0.357	"
"	Maximum flow	0.193	0.000	0.193	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.193	1.700	0.000	0.000"	
" 33	CATCHMENT 30"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	30 Catchment 30"				
"	5.000 % Impervious"				
"	2.000 Total Area"				
"	40.000 Flow length"				
"	3.750 Overland Slope"				
"	1.900 Pervious Area"				
"	40.000 Pervious length"				
"	3.750 Pervious slope"				
"	0.100 Impervious Area"				
"	40.000 Impervious length"				
"	3.750 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.188	1.700	0.000	0.000 c.m/sec"	
"	Catchment 30	Pervious	Impervious	Total Area	"
"	Surface Area	1.900	0.100	2.000	hectare"
"	Time of concentration	12.141	2.181	10.914	minutes"
"	Time to Centroid	117.971	114.662	117.563	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	750.58	39.50	790.08	c.m"
"	Rainfall losses	25.401	1.860	24.224	mm"
"	Runoff depth	14.103	37.644	15.280	mm"
"	Runoff volume	267.95	37.64	305.59	c.m"
"	Runoff coefficient	0.357	0.953	0.387	"
"	Maximum flow	0.183	0.026	0.188	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.188	1.787	0.000	0.000"	
" 33	CATCHMENT 20"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	20	Catchment 20"			
"	0.000	% Impervious"			
"	2.980	Total Area"			
"	80.000	Flow length"			
"	1.250	Overland Slope"			
"	2.980	Pervious Area"			
"	80.000	Pervious length"			
"	1.250	Pervious slope"			
"	0.000	Impervious Area"			
"	80.000	Impervious length"			
"	1.250	Impervious slope"			
"	0.250	Pervious Manning 'n' "			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n' "			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.169	1.787	0.000	0.000 c.m/sec"
"		Catchment 20	Pervious	Impervious	Total Area "
"		Surface Area	2.980	0.000	2.980 hectare"
"		Time of concentration	25.587	4.597	25.587 minutes"
"		Time to Centroid	135.809	118.488	135.809 minutes"
"		Rainfall depth	39.504	39.504	39.504 mm"
"		Rainfall volume	1177.22	0.00	1177.22 c.m"
"		Rainfall losses	25.405	1.665	25.405 mm"
"		Runoff depth	14.099	37.839	14.099 mm"
"		Runoff volume	420.16	0.00	420.16 c.m"
"		Runoff coefficient	0.357	0.000	0.357 "
"		Maximum flow	0.169	0.000	0.169 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.169	1.947	0.000	0.000"
" 38		START/RE-START TOTALS 20"			
"	3	Runoff Totals on EXIT"			
"		Total Catchment area		39.420	hectare"
"		Total Impervious area		0.722	hectare"
"		Total % impervious		1.832"	
" 19		EXIT"			

```

"                MIDUSS Output ----->"
"                MIDUSS version                      Version 2.25  rev. 473"
"                MIDUSS created                      Sunday, February 7, 2010"
"            10  Units used:                          ie METRIC"
"                Job folder:                          B:\Working\POLOCORP INC\
"                2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"                Output filename:                      Ex__5yr.out"
"                Licensee name:                        "
"                Company                                "
"                Date & Time last used:                2/1/2025 at 10:00:00 AM"
" 31            TIME PARAMETERS"
"            5.000  Time Step"
"            240.000 Max. Storm length"
"            2000.000 Max. Hydrograph"
" 32            STORM Chicago storm"
"            1  Chicago storm"
"            544.711 Coefficient A"
"            0.021  Constant B"
"            0.686  Exponent C"
"            0.375  Fraction R"
"            240.000 Duration"
"            1.000  Time step multiplier"
"                Maximum intensity          130.581  mm/hr"
"                Total depth                50.743  mm"
"            6  005hyd Hydrograph extension used in this file"
" 33            CATCHMENT 10"
"            1  Triangular SCS"
"            1  Equal length"
"            2  Horton equation"
"            10  Catchment 10"
"            2.000  % Impervious"
"            31.110 Total Area"
"            200.000 Flow length"
"            3.750  Overland Slope"
"            30.488 Pervious Area"
"            200.000 Pervious length"
"            3.750  Pervious slope"
"            0.622  Impervious Area"
"            200.000 Impervious length"
"            3.750  Impervious slope"
"            0.250 Pervious Manning 'n'"
"            30.000 Pervious Max.infiltration"
"            5.000  Pervious Min.infiltration"
"            0.250 Pervious Lag constant (hours)"
"            5.000  Pervious Depression storage"
"            0.015 Impervious Manning 'n'"
"            0.000 Impervious Max.infiltration"
"            0.000 Impervious Min.infiltration"
"            0.001 Impervious Lag constant (hours)"

```


"	1.500	Impervious Depression storage"				
"	2.658	0.000	0.000	0.000	c.m/sec"	
"	Catchment 10	Pervious	Impervious	Total Area	"	
"	Surface Area	30.488	0.622	31.110	hectare"	
"	Time of concentration	28.411	5.154	27.464	minutes"	
"	Time to Centroid	142.235	118.538	141.271	minutes"	
"	Rainfall depth	50.743	50.743	50.743	mm"	
"	Rainfall volume	1.5470	0.0316	1.5786	ha-m"	
"	Rainfall losses	27.148	1.682	26.639	mm"	
"	Runoff depth	23.595	49.061	24.104	mm"	
"	Runoff volume	7193.54	305.26	7498.80	c.m"	
"	Runoff coefficient	0.465	0.967	0.475	"	
"	Maximum flow	2.627	0.173	2.658	c.m/sec"	
" 40	HYDROGRAPH Add Runoff "					
"	4	Add Runoff "				
"	2.658	2.658	0.000	0.000"		
" 33	CATCHMENT 40"					
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	40	Catchment 40"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"	0.356	2.658	0.000	0.000	c.m/sec"	
"	Catchment 40	Pervious	Impervious	Total Area	"	
"	Surface Area	3.330	0.000	3.330	hectare"	
"	Time of concentration	22.359	4.056	22.359	minutes"	
"	Time to Centroid	134.036	116.866	134.036	minutes"	
"	Rainfall depth	50.743	50.743	50.743	mm"	
"	Rainfall volume	1689.74	0.00	1689.74	c.m"	
"	Rainfall losses	27.188	2.068	27.188	mm"	
"	Runoff depth	23.555	48.675	23.555	mm"	

"	Runoff volume	784.37	0.00	784.38	c.m"
"	Runoff coefficient	0.464	0.000	0.464	"
"	Maximum flow	0.356	0.000	0.356	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.356	2.963	0.000	0.000"	
" 33	CATCHMENT 30"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	30 Catchment 30"				
"	5.000 % Impervious"				
"	2.000 Total Area"				
"	40.000 Flow length"				
"	3.750 Overland Slope"				
"	1.900 Pervious Area"				
"	40.000 Pervious length"				
"	3.750 Pervious slope"				
"	0.100 Impervious Area"				
"	40.000 Impervious length"				
"	3.750 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.332	2.963	0.000	0.000 c.m/sec"	
"	Catchment 30	Pervious	Impervious	Total Area	"
"	Surface Area	1.900	0.100	2.000	hectare"
"	Time of concentration	10.817	1.962	9.949	minutes"
"	Time to Centroid	118.405	113.377	117.912	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	964.12	50.74	1014.86	c.m"
"	Rainfall losses	27.163	2.058	25.908	mm"
"	Runoff depth	23.580	48.685	24.835	mm"
"	Runoff volume	448.02	48.69	496.71	c.m"
"	Runoff coefficient	0.465	0.959	0.489	"
"	Maximum flow	0.314	0.033	0.332	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.332	3.061	0.000	0.000"	
" 33	CATCHMENT 20"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	20	Catchment 20"				
"	0.000	% Impervious"				
"	2.980	Total Area"				
"	80.000	Flow length"				
"	1.250	Overland Slope"				
"	2.980	Pervious Area"				
"	80.000	Pervious length"				
"	1.250	Pervious slope"				
"	0.000	Impervious Area"				
"	80.000	Impervious length"				
"	1.250	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.317	3.061	0.000	0.000 c.m/sec"	
"		Catchment 20	Pervious	Impervious	Total Area	"
"		Surface Area	2.980	0.000	2.980	hectare"
"		Time of concentration	22.796	4.135	22.796	minutes"
"		Time to Centroid	134.645	116.951	134.645	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	1512.14	0.00	1512.14	c.m"
"		Rainfall losses	27.154	1.996	27.154	mm"
"		Runoff depth	23.589	48.747	23.589	mm"
"		Runoff volume	702.95	0.00	702.95	c.m"
"		Runoff coefficient	0.465	0.000	0.465	"
"		Maximum flow	0.317	0.000	0.317	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"		4 Add Runoff "				
"		0.317	3.346	0.000	0.000"	
" 38		START/RE-START TOTALS 20"				
"		3 Runoff Totals on EXIT"				
"		Total Catchment area		39.420	hectare"	
"		Total Impervious area		0.722	hectare"	
"		Total % impervious		1.832"		
" 19		EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Ex__10yr.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/1/2025 at 10:01:14 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          627.308  Coefficient A"
"          0.014  Constant B"
"          0.687  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          150.159  mm/hr"
"          Total depth          58.119  mm"
"          6  010hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 10"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          10  Catchment 10"
"          2.000  % Impervious"
"          31.110  Total Area"
"          200.000  Flow length"
"          3.750  Overland Slope"
"          30.488  Pervious Area"
"          200.000  Pervious length"
"          3.750  Pervious slope"
"          0.622  Impervious Area"
"          200.000  Impervious length"
"          3.750  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"			
"		3.519	0.000	0.000	0.000 c.m/sec"
"		Catchment 10	Pervious	Impervious	Total Area "
"		Surface Area	30.488	0.622	31.110 hectare"
"		Time of concentration	26.776	4.874	25.973 minutes"
"		Time to Centroid	142.154	117.737	141.259 minutes"
"		Rainfall depth	58.119	58.119	58.119 mm"
"		Rainfall volume	1.7719	0.0362	1.8081 ha-m"
"		Rainfall losses	27.874	1.726	27.351 mm"
"		Runoff depth	30.245	56.393	30.768 mm"
"		Runoff volume	9221.02	350.88	9571.89 c.m"
"		Runoff coefficient	0.520	0.970	0.529 "
"		Maximum flow	3.479	0.202	3.519 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		3.519	3.519	0.000	0.000"
" 33		CATCHMENT 40"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	40	Catchment 40"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			
"	3.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.455	3.519	0.000	0.000 c.m/sec"
"		Catchment 40	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	21.072	3.835	21.072 minutes"
"		Time to Centroid	134.304	116.233	134.304 minutes"
"		Rainfall depth	58.119	58.119	58.119 mm"
"		Rainfall volume	1935.36	0.00	1935.37 c.m"
"		Rainfall losses	27.871	2.469	27.871 mm"
"		Runoff depth	30.248	55.650	30.248 mm"

"	Runoff volume	1007.27	0.00	1007.27	c.m"
"	Runoff coefficient	0.520	0.000	0.520	"
"	Maximum flow	0.455	0.000	0.455	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.455	3.974	0.000	0.000"	
" 33	CATCHMENT 30"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	30 Catchment 30"				
"	5.000 % Impervious"				
"	2.000 Total Area"				
"	40.000 Flow length"				
"	3.750 Overland Slope"				
"	1.900 Pervious Area"				
"	40.000 Pervious length"				
"	3.750 Pervious slope"				
"	0.100 Impervious Area"				
"	40.000 Impervious length"				
"	3.750 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.437	3.974	0.000	0.000 c.m/sec"	
"	Catchment 30	Pervious	Impervious	Total Area	"
"	Surface Area	1.900	0.100	2.000	hectare"
"	Time of concentration	10.194	1.856	9.450	minutes"
"	Time to Centroid	119.342	112.794	118.757	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"
"	Rainfall volume	1104.26	58.12	1162.38	c.m"
"	Rainfall losses	28.125	2.227	26.830	mm"
"	Runoff depth	29.994	55.893	31.289	mm"
"	Runoff volume	569.88	55.89	625.77	c.m"
"	Runoff coefficient	0.516	0.962	0.538	"
"	Maximum flow	0.417	0.038	0.437	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.437	4.203	0.000	0.000"	
" 33	CATCHMENT 20"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	20	Catchment 20"			
"	0.000	% Impervious"			
"	2.980	Total Area"			
"	80.000	Flow length"			
"	1.250	Overland Slope"			
"	2.980	Pervious Area"			
"	80.000	Pervious length"			
"	1.250	Pervious slope"			
"	0.000	Impervious Area"			
"	80.000	Impervious length"			
"	1.250	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.405	4.203	0.000	0.000 c.m/sec"
"		Catchment 20	Pervious	Impervious	Total Area "
"		Surface Area	2.980	0.000	2.980 hectare"
"		Time of concentration	21.484	3.910	21.484 minutes"
"		Time to Centroid	134.868	116.328	134.868 minutes"
"		Rainfall depth	58.119	58.119	58.119 mm"
"		Rainfall volume	1731.95	0.00	1731.95 c.m"
"		Rainfall losses	27.884	2.347	27.884 mm"
"		Runoff depth	30.235	55.772	30.235 mm"
"		Runoff volume	901.02	0.00	901.02 c.m"
"		Runoff coefficient	0.520	0.000	0.520 "
"		Maximum flow	0.405	0.000	0.405 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"		4 Add Runoff "			
"		0.405	4.608	0.000	0.000"
" 38		START/RE-START TOTALS 20"			
"		3 Runoff Totals on EXIT"			
"		Total Catchment area		39.420	hectare"
"		Total Impervious area		0.722	hectare"
"		Total % impervious		1.832"	
" 19		EXIT"			

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Ex__25yr.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/1/2025 at 10:02:34 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          746.059  Coefficient A"
"          0.085  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          175.653  mm/hr"
"          Total depth          67.239  mm"
"          6  025hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 10"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          10  Catchment 10"
"          2.000  % Impervious"
"          31.110  Total Area"
"          200.000  Flow length"
"          3.750  Overland Slope"
"          30.488  Pervious Area"
"          200.000  Pervious length"
"          3.750  Pervious slope"
"          0.622  Impervious Area"
"          200.000  Impervious length"
"          3.750  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```


"	1.500	Impervious Depression storage"				
"		4.835	0.000	0.000	0.000 c.m/sec"	
"		Catchment 10	Pervious	Impervious	Total Area	"
"		Surface Area	30.488	0.622	31.110	hectare"
"		Time of concentration	25.077	4.577	24.395	minutes"
"		Time to Centroid	142.054	116.842	141.215	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	2.0500	0.0418	2.0918	ha-m"
"		Rainfall losses	28.420	1.790	27.888	mm"
"		Runoff depth	38.818	65.448	39.351	mm"
"		Runoff volume	1.1835	0.0407	1.2242	ha-m"
"		Runoff coefficient	0.577	0.973	0.585	"
"		Maximum flow	4.789	0.242	4.835	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		4.835	4.835	0.000	0.000"	
" 33		CATCHMENT 40"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	40	Catchment 40"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.607	4.835	0.000	0.000 c.m/sec"	
"		Catchment 40	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	19.735	3.602	19.735	minutes"
"		Time to Centroid	134.608	115.439	134.608	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	2239.05	0.00	2239.05	c.m"
"		Rainfall losses	28.441	2.959	28.441	mm"
"		Runoff depth	38.798	64.280	38.798	mm"

"	Runoff volume	1291.96	0.00	1291.97	c.m"
"	Runoff coefficient	0.577	0.000	0.577	"
"	Maximum flow	0.607	0.000	0.607	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.607	5.416	0.000	0.000"	
" 33	CATCHMENT 30"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	30 Catchment 30"				
"	5.000 % Impervious"				
"	2.000 Total Area"				
"	40.000 Flow length"				
"	3.750 Overland Slope"				
"	1.900 Pervious Area"				
"	40.000 Pervious length"				
"	3.750 Pervious slope"				
"	0.100 Impervious Area"				
"	40.000 Impervious length"				
"	3.750 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.574	5.416	0.000	0.000 c.m/sec"	
"	Catchment 30	Pervious	Impervious	Total Area	"
"	Surface Area	1.900	0.100	2.000	hectare"
"	Time of concentration	9.548	1.743	8.915	minutes"
"	Time to Centroid	120.388	112.106	119.717	minutes"
"	Rainfall depth	67.239	67.239	67.239	mm"
"	Rainfall volume	1277.54	67.24	1344.78	c.m"
"	Rainfall losses	28.570	2.417	27.262	mm"
"	Runoff depth	38.669	64.822	39.977	mm"
"	Runoff volume	734.71	64.82	799.53	c.m"
"	Runoff coefficient	0.575	0.964	0.595	"
"	Maximum flow	0.551	0.045	0.574	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.574	5.660	0.000	0.000"	
" 33	CATCHMENT 20"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	20	Catchment 20"			
"	0.000	% Impervious"			
"	2.980	Total Area"			
"	80.000	Flow length"			
"	1.250	Overland Slope"			
"	2.980	Pervious Area"			
"	80.000	Pervious length"			
"	1.250	Pervious slope"			
"	0.000	Impervious Area"			
"	80.000	Impervious length"			
"	1.250	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.532	5.660	0.000	0.000 c.m/sec"
"		Catchment 20	Pervious	Impervious	Total Area "
"		Surface Area	2.980	0.000	2.980 hectare"
"		Time of concentration	20.121	3.673	20.121 minutes"
"		Time to Centroid	135.142	115.553	135.142 minutes"
"		Rainfall depth	67.239	67.239	67.239 mm"
"		Rainfall volume	2003.72	0.00	2003.72 c.m"
"		Rainfall losses	28.405	2.912	28.405 mm"
"		Runoff depth	38.834	64.327	38.834 mm"
"		Runoff volume	1157.25	0.00	1157.26 c.m"
"		Runoff coefficient	0.578	0.000	0.578 "
"		Maximum flow	0.532	0.000	0.532 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.532	6.178	0.000	0.000"
" 38		START/RE-START TOTALS 20"			
"	3	Runoff Totals on EXIT"			
"		Total Catchment area		39.420	hectare"
"		Total Impervious area		0.722	hectare"
"		Total % impervious		1.832"	
" 19		EXIT"			

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Ex__50yr.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/1/2025 at 10:03:46 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          820.361  Coefficient A"
"          0.010  Constant B"
"          0.691  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          194.803  mm/hr"
"          Total depth          74.358  mm"
"          6  050hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 10"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          10  Catchment 10"
"          2.000  % Impervious"
"          31.110  Total Area"
"          200.000  Flow length"
"          3.750  Overland Slope"
"          30.488  Pervious Area"
"          200.000  Pervious length"
"          3.750  Pervious slope"
"          0.622  Impervious Area"
"          200.000  Impervious length"
"          3.750  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"			
"		5.783	0.000	0.000	0.000 c.m/sec"
"		Catchment 10	Pervious	Impervious	Total Area "
"		Surface Area	30.488	0.622	31.110 hectare"
"		Time of concentration	24.024	4.392	23.408 minutes"
"		Time to Centroid	142.713	116.390	141.888 minutes"
"		Rainfall depth	74.358	74.358	74.358 mm"
"		Rainfall volume	2.2670	0.0463	2.3133 ha-m"
"		Rainfall losses	28.718	1.950	28.183 mm"
"		Runoff depth	45.640	72.408	46.175 mm"
"		Runoff volume	1.3915	0.0451	1.4365 ha-m"
"		Runoff coefficient	0.614	0.974	0.621 "
"		Maximum flow	5.731	0.272	5.783 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		5.783	5.783	0.000	0.000"
" 33		CATCHMENT 40"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	40	Catchment 40"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			
"	3.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.720	5.783	0.000	0.000 c.m/sec"
"		Catchment 40	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	18.906	3.456	18.906 minutes"
"		Time to Centroid	135.377	115.016	135.377 minutes"
"		Rainfall depth	74.358	74.358	74.358 mm"
"		Rainfall volume	2476.11	0.00	2476.11 c.m"
"		Rainfall losses	28.813	3.112	28.813 mm"
"		Runoff depth	45.544	71.246	45.544 mm"

"	Runoff volume	1516.63	0.00	1516.63	c.m"
"	Runoff coefficient	0.613	0.000	0.613	"
"	Maximum flow	0.720	0.000	0.720	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.720	6.448	0.000	0.000"	
" 33	CATCHMENT 30"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	30 Catchment 30"				
"	5.000 % Impervious"				
"	2.000 Total Area"				
"	40.000 Flow length"				
"	3.750 Overland Slope"				
"	1.900 Pervious Area"				
"	40.000 Pervious length"				
"	3.750 Pervious slope"				
"	0.100 Impervious Area"				
"	40.000 Impervious length"				
"	3.750 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.670	6.448	0.000	0.000 c.m/sec"	
"	Catchment 30	Pervious	Impervious	Total Area	"
"	Surface Area	1.900	0.100	2.000	hectare"
"	Time of concentration	9.147	1.672	8.573	minutes"
"	Time to Centroid	121.402	111.843	120.668	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"
"	Rainfall volume	1412.80	74.36	1487.16	c.m"
"	Rainfall losses	28.890	2.541	27.572	mm"
"	Runoff depth	45.468	71.816	46.785	mm"
"	Runoff volume	863.89	71.82	935.71	c.m"
"	Runoff coefficient	0.611	0.966	0.629	"
"	Maximum flow	0.645	0.050	0.670	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.670	6.702	0.000	0.000"	
" 33	CATCHMENT 20"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	20	Catchment 20"			
"	0.000	% Impervious"			
"	2.980	Total Area"			
"	80.000	Flow length"			
"	1.250	Overland Slope"			
"	2.980	Pervious Area"			
"	80.000	Pervious length"			
"	1.250	Pervious slope"			
"	0.000	Impervious Area"			
"	80.000	Impervious length"			
"	1.250	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.633	6.702	0.000	0.000 c.m/sec"
"		Catchment 20	Pervious	Impervious	Total Area "
"		Surface Area	2.980	0.000	2.980 hectare"
"		Time of concentration	19.276	3.524	19.276 minutes"
"		Time to Centroid	135.920	115.139	135.920 minutes"
"		Rainfall depth	74.358	74.358	74.358 mm"
"		Rainfall volume	2215.86	0.00	2215.86 c.m"
"		Rainfall losses	28.877	3.109	28.877 mm"
"		Runoff depth	45.481	71.249	45.481 mm"
"		Runoff volume	1355.32	0.00	1355.32 c.m"
"		Runoff coefficient	0.612	0.000	0.612 "
"		Maximum flow	0.633	0.000	0.633 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"		4 Add Runoff "			
"		0.633	7.296	0.000	0.000"
" 38		START/RE-START TOTALS 20"			
"		3 Runoff Totals on EXIT"			
"		Total Catchment area		39.420	hectare"
"		Total Impervious area		0.722	hectare"
"		Total % impervious		1.832"	
" 19		EXIT"			

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Ex__100yr.out"
"          Licensee name:                      "
"          Company                      "
"          Date & Time last used:                2/1/2025 at 10:05:05 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          901.088  Coefficient A"
"          0.043  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                212.928  mm/hr"
"          Total depth                81.221  mm"
"          6  100hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 10"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          10  Catchment 10"
"          2.000  % Impervious"
"          31.110  Total Area"
"          200.000  Flow length"
"          3.750  Overland Slope"
"          30.488  Pervious Area"
"          200.000  Pervious length"
"          3.750  Pervious slope"
"          0.622  Impervious Area"
"          200.000  Impervious length"
"          3.750  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```


"	1.500	Impervious Depression storage"			
"		6.563	0.000	0.000	0.000 c.m/sec"
"		Catchment 10	Pervious	Impervious	Total Area "
"		Surface Area	30.488	0.622	31.110 hectare"
"		Time of concentration	23.158	4.238	22.591 minutes"
"		Time to Centroid	142.372	115.974	141.581 minutes"
"		Rainfall depth	81.221	81.221	81.221 mm"
"		Rainfall volume	2.4762	0.0505	2.5268 ha-m"
"		Rainfall losses	28.992	2.155	28.455 mm"
"		Runoff depth	52.229	79.066	52.765 mm"
"		Runoff volume	1.5923	0.0492	1.6415 ha-m"
"		Runoff coefficient	0.643	0.973	0.650 "
"		Maximum flow	6.506	0.301	6.563 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		6.563	6.563	0.000	0.000"
" 33		CATCHMENT 40"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	40	Catchment 40"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			
"	3.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.835	6.563	0.000	0.000 c.m/sec"
"		Catchment 40	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	18.225	3.335	18.225 minutes"
"		Time to Centroid	135.263	114.631	135.263 minutes"
"		Rainfall depth	81.221	81.221	81.221 mm"
"		Rainfall volume	2704.65	0.00	2704.66 c.m"
"		Rainfall losses	28.982	3.311	28.982 mm"
"		Runoff depth	52.239	77.910	52.239 mm"

"	Runoff volume	1739.55	0.00	1739.55	c.m"
"	Runoff coefficient	0.643	0.000	0.643	"
"	Maximum flow	0.835	0.000	0.835	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.835	7.319	0.000	0.000"	
" 33	CATCHMENT 30"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	30 Catchment 30"				
"	5.000 % Impervious"				
"	2.000 Total Area"				
"	40.000 Flow length"				
"	3.750 Overland Slope"				
"	1.900 Pervious Area"				
"	40.000 Pervious length"				
"	3.750 Pervious slope"				
"	0.100 Impervious Area"				
"	40.000 Impervious length"				
"	3.750 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.768	7.319	0.000	0.000 c.m/sec"	
"	Catchment 30	Pervious	Impervious	Total Area	"
"	Surface Area	1.900	0.100	2.000	hectare"
"	Time of concentration	8.817	1.614	8.287	minutes"
"	Time to Centroid	121.743	111.617	120.997	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"
"	Rainfall volume	1543.20	81.22	1624.42	c.m"
"	Rainfall losses	29.209	2.686	27.883	mm"
"	Runoff depth	52.011	78.534	53.338	mm"
"	Runoff volume	988.22	78.53	1066.75	c.m"
"	Runoff coefficient	0.640	0.967	0.657	"
"	Maximum flow	0.742	0.054	0.768	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.768	7.588	0.000	0.000"	
" 33	CATCHMENT 20"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	20	Catchment 20"			
"	0.000	% Impervious"			
"	2.980	Total Area"			
"	80.000	Flow length"			
"	1.250	Overland Slope"			
"	2.980	Pervious Area"			
"	80.000	Pervious length"			
"	1.250	Pervious slope"			
"	0.000	Impervious Area"			
"	80.000	Impervious length"			
"	1.250	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.734	7.588	0.000	0.000 c.m/sec"
"		Catchment 20	Pervious	Impervious	Total Area "
"		Surface Area	2.980	0.000	2.980 hectare"
"		Time of concentration	18.581	3.401	18.581 minutes"
"		Time to Centroid	135.779	114.745	135.779 minutes"
"		Rainfall depth	81.221	81.221	81.221 mm"
"		Rainfall volume	2420.38	0.00	2420.38 c.m"
"		Rainfall losses	29.021	3.280	29.021 mm"
"		Runoff depth	52.200	77.941	52.200 mm"
"		Runoff volume	1555.57	0.00	1555.57 c.m"
"		Runoff coefficient	0.643	0.000	0.643 "
"		Maximum flow	0.734	0.000	0.734 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"		4 Add Runoff "			
"		0.734	8.263	0.000	0.000"
" 38		START/RE-START TOTALS 20"			
"		3 Runoff Totals on EXIT"			
"		Total Catchment area		39.420	hectare"
"		Total Impervious area		0.722	hectare"
"		Total % impervious		1.832"	
" 19		EXIT"			

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Ex__REG.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/1/2025 at 10:06:12 AM"
" 31          TIME PARAMETERS"
"          60.000  Time Step"
"          2880.000  Max. Storm length"
"          7500.000  Max. Hydrograph"
" 32          STORM Historic"
"          5  Historic"
"          2880.000  Duration"
"          48.000  Rainfall intensity values"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.026      2.026      2.026      2.028"
"                  2.026      6.000      4.000      6.000      13.000"
"                  17.000      13.000      23.000      13.000      13.000"
"                  53.000      38.000      13.000"
"          Maximum intensity                    53.000      mm/hr"
"          Total depth                          285.000      mm"
"          6  000hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 10"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          10  Catchment 10"
"          2.000  % Impervious"
"          31.110  Total Area"
"          200.000  Flow length"
"          3.750  Overland Slope"
"          30.488  Pervious Area"
"          200.000  Pervious length"
"          3.750  Pervious slope"
"          0.622  Impervious Area"
"          200.000  Impervious length"
"          3.750  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"

```

"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		3.396	0.000	0.000	0.000 c.m/sec"
"		Catchment 10	Pervious	Impervious	Total Area "
"		Surface Area	30.488	0.622	31.110 hectare"
"		Time of concentration	41.600	7.392	40.367 minutes"
"		Time to Centroid	2745.601	2247.763	2727.666 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	8.6890	0.1773	8.8664 ha-m"
"		Rainfall losses	141.365	21.980	138.978 mm"
"		Runoff depth	143.635	263.020	146.022 mm"
"		Runoff volume	4.3791	0.1637	4.5428 ha-m"
"		Runoff coefficient	0.504	0.923	0.512 "
"		Maximum flow	3.340	0.079	3.396 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		3.396	3.396	0.000	0.000"
" 33		CATCHMENT 40"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	40	Catchment 40"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			
"	3.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.366	3.396	0.000	0.000 c.m/sec"
"		Catchment 40	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"

"	Time of concentration	32.738	5.817	32.738	minutes"
"	Time to Centroid	2737.685	2233.111	2737.684	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	9490.49	0.01	9490.50	c.m"
"	Rainfall losses	139.700	29.327	139.699	mm"
"	Runoff depth	145.300	255.673	145.301	mm"
"	Runoff volume	4838.50	0.01	4838.51	c.m"
"	Runoff coefficient	0.510	0.000	0.510	"
"	Maximum flow	0.366	0.000	0.366	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4	Add Runoff "			
"		0.366	3.762	0.000	0.000"
" 33	CATCHMENT 30"				
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	30	Catchment 30"			
"	5.000	% Impervious"			
"	2.000	Total Area"			
"	40.000	Flow length"			
"	3.750	Overland Slope"			
"	1.900	Pervious Area"			
"	40.000	Pervious length"			
"	3.750	Pervious slope"			
"	0.100	Impervious Area"			
"	40.000	Impervious length"			
"	3.750	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.211	3.762	0.000	0.000 c.m/sec"
"	Catchment 30	Pervious	Impervious	Total Area	"
"	Surface Area	1.900	0.100	2.000	hectare"
"	Time of concentration	15.838	2.814	14.776	minutes"
"	Time to Centroid	2719.829	2252.474	2681.704	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	5415.00	285.00	5700.00	c.m"
"	Rainfall losses	139.630	39.672	134.632	mm"
"	Runoff depth	145.370	245.328	150.368	mm"
"	Runoff volume	2762.02	245.33	3007.35	c.m"
"	Runoff coefficient	0.510	0.861	0.528	"
"	Maximum flow	0.198	0.013	0.211	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				

"	4	Add Runoff "				
"		0.211	3.956	0.000	0.000"	
" 33		CATCHMENT 20"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	20	Catchment 20"				
"	0.000	% Impervious"				
"	2.980	Total Area"				
"	80.000	Flow length"				
"	1.250	Overland Slope"				
"	2.980	Pervious Area"				
"	80.000	Pervious length"				
"	1.250	Pervious slope"				
"	0.000	Impervious Area"				
"	80.000	Impervious length"				
"	1.250	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.010	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.327	3.956	0.000	0.000 c.m/sec"	
"		Catchment 20	Pervious	Impervious	Total Area "	
"		Surface Area	2.980	0.000	2.980	hectare"
"		Time of concentration	33.378	5.931	33.378	minutes"
"		Time to Centroid	2738.064	2233.739	2738.063	minutes"
"		Rainfall depth	285.000	285.000	285.000	mm"
"		Rainfall volume	8492.99	0.01	8493.00	c.m"
"		Rainfall losses	139.842	28.841	139.842	mm"
"		Runoff depth	145.158	256.159	145.158	mm"
"		Runoff volume	4325.70	0.01	4325.71	c.m"
"		Runoff coefficient	0.509	0.000	0.509	"
"		Maximum flow	0.327	0.000	0.327	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.327	4.283	0.000	0.000"	
" 38		START/RE-START TOTALS 20"				
"	3	Runoff Totals on EXIT"				
"		Total Catchment area		39.420	hectare"	
"		Total Impervious area		0.722	hectare"	
"		Total % impervious		1.832"		
" 19		EXIT"				

C.2. Interim Post-Development Conditions Modelling

NORTH LANDS SUBDIVISION
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)
Our File: 422079
March 4, 2025

Proposed Forebay

Forebay Length =	140.0 m	(Dist)
Forebay Top Width =	27.0 m	
Active Forebay Depth =	1.0 m	(d)
Active Forebay Bottom Width =	21.0 m	
Approximate Permanent Forebay Pool Volume =	224.9 m ³	
Length Width Ratio =	5.2 :1	(r)
25 mm Storm Pond Outlet Flowrate =	0.043 m ³ /s	(Q25mm)
5 Year Storm Inflow Rate =	8.626 m ³ /s	(Q5)
Desired Forebay Velocity =	0.500 m/s	(Vf)
Desired Settling Velocity (recommended) =	0.0003 m/s	(Vs)

Settling Length

$$\text{Dist} = ((r \times Q_{25\text{mm}})/V_s)^{.5} = 27.3 \text{ m} \quad 25\text{mm}$$

Forebay length (140 m) exceeds the settling length (27.3 m).

Dispersion Length

$$\text{Dist} = (8 \times Q_5)/(d \times V_f) = 138.0 \text{ m} \quad 5 \text{ Year}$$

Forebay length (140 m) exceeds the dispersion length (138.0 m).

Flow Velocity in Forebay

Cross-sectional Area (Forebay Only) =	24 m ²	
Cross-sectional Area (With Permanent Pool) =	41.85 m ²	
Cross-sectional Area (With Outlet Pool) =	57.85 m ²	(A)
Q5 =	8.626 m ³ /s	
Velocity = Q5/A =	0.149 m/s	5 Year

The average flow velocity through the forebay is equal to the allowable velocity of 0.15 m/s.

NORTH LANDS SUBDIVISION
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)
Our File: 422079
March 4, 2025

SWM Facility - Stage/Storage Volume Calculations

Forebay/Permanent Pool Storage Volume Calculations

Elevation (m)	Depth (m)	Forebay Surface Area (m ²)	Forebay Incremental Storage Volume (m ³)	Perm. Pool Surface Area (m ²)	Perm. Pool Incremental Storage Volume (m ³)	Accumulative Volume (m ³)	
420.20	0.00	0.0	0.0			0.0	Bottom of Forebay
420.40	0.20	817.9	81.79			81.8	
420.60	0.40	902.4	172.03			253.8	
420.80	0.60	989.3	189.17			443.0	
421.00	0.80	1,078.6	206.79			649.8	
421.20	1.00	1,170.2	224.88	9,630.00	0.00	874.7	Bottom of Permanent Pool
421.30	1.10			9,798.00	971.40	1,846.1	
421.40	1.20			10,157.40	997.77	2,843.8	
421.50	1.30			10,518.80	1,033.81	3,877.6	Top of Permanent Pool

Active Storage Volume Calculations

Elevation (m)	Depth (m)	Active Surface Area (m ²)	Active Incremental Volume (m ³)	Accumulative Active Volume (m ³)	
421.50	0.00	10,518.8	0.00	0.00	Bottom of Active Storage
421.60	0.10	10,882.4	1,070.06	1,070.06	
421.70	0.20	11,248.2	1,106.53	2,176.59	
421.80	0.30	11,616.3	1,143.23	3,319.82	
421.90	0.40	11,986.6	1,180.15	4,499.96	
422.00	0.50	12,359.0	1,217.28	5,717.24	T/G DICB.1
422.10	0.60	12,841.0	1,260.00	6,977.24	
422.20	0.70	13,125.1	1,298.31	8,275.55	
422.30	0.80	13,410.9	1,326.80	9,602.35	T/G DICB.2
422.40	0.90	13,698.3	1,355.46	10,957.81	
422.50	1.00	13,987.2	1,384.27	12,342.08	
422.60	1.10	14,277.9	1,413.26	13,755.34	Weir
422.70	1.20	14,570.1	1,442.40	15,197.74	
422.80	1.30	14,864.0	1,471.71	16,669.44	
422.90	1.40	15,159.4	1,501.17	18,170.61	
423.00	1.50	15,456.5	1,530.80	19,701.41	
423.10	1.60	15,755.3	1,560.59	21,262.00	Top of Pond
423.20	1.70	16,055.6	1,590.55	22,852.54	

1800 x1800 Structure Controls

Orifice Outlet (Extended Detention)

modelled with 50% blockage

INV = 421.50 m
 Q = 0.044 m³/s
 Cd = 0.600
 H = 1.100 m
 2g = 19.620
 A = 0.031 m²
 D = 0.200 m

Overflow Weir

d1 = 1.500 m
 h = 1.200
 H = 0.300 m
 2g = 19.620
 L = 15.0 m
 Q = 3.524 m³/s

$$\text{Orifice Flow} = Cd A \sqrt{2gH}$$

Cd = Discharge Coefficient
 A = Area of Orifice
 2g = 19.62
 H = Depth of Water above orifice - half of orifice diameter

Major Control - Flow Over Grate

modelled with 50% blockage

d1 = 0.80 m
 h = 0.50
 H = 0.30 m
 2g = 19.62
 L = 3.66 m
 Q = 0.453 m³/s

Length of Weir

Head over Grate (m)	Length (m)
0	1.200
0.1	1.832
0.2	2.464
0.3	3.66

Pipe Outflow - Outlet 1

INV. = 421.34 m
 Diameter = 525 mm
 Gradient = 0.50%
 Pipe Capacity = 0.317 m³/s
 Length = 21.30 m

Pipe Outflow - Outlet 2

INV. = 421.5 m
 Diameter = 600 mm
 Gradient = 1%
 Pipe Capacity = 0.641 m³/s
 Length = 20.30 m

$$\text{Weir Flow} = 0.433 \sqrt{2g\left(\frac{d}{d+h}\right)} LH^{3/2}$$

L = Length of Weir
 2g = 19.62
 d = total depth of water
 h = depth of water below weir
 H = depth of water above weir

Stage-Storage-Discharge Table										
Elevation (m)	Stage (m)	Storage (m ³)	OUTLET STRUCTURE 1		OUTLET STRUCTURE 2			Weir Overflow (m ³ /s)	Actual Discharge (m ³ /s)	
			Major Control Grate (m ³ /s)	Major Control Pipe Outlet (m ³ /s)	200mm dia. Minor Outlet (m ³ /s)	Major Control Grate (m ³ /s)	Major Control Pipe Outlet (m ³ /s)			
421.50	0.00	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Bottom of Active Storage
421.60	0.10	1,070.1	0.000	0.152	0.007	0.000	0.039	0.000	0.007	
421.70	0.20	2,176.6	0.000	0.250	0.013	0.000	0.144	0.000	0.013	
421.80	0.30	3,319.8	0.000	0.317	0.019	0.000	0.307	0.000	0.019	
421.90	0.40	4,500.0	0.000	0.317	0.023	0.000	0.485	0.000	0.023	
422.00	0.50	5,717.2	0.000	0.317	0.026	0.000	0.621	0.000	0.026	T/G DICB.1
422.10	0.60	6,977.2	0.041	0.317	0.030	0.000	0.641	0.000	0.071	
422.20	0.70	8,275.5	0.161	0.317	0.032	0.000	0.641	0.000	0.194	
422.30	0.80	9,602.3	0.453	0.317	0.035	0.000	0.641	0.000	0.352	T/G DICB.2
422.40	0.90	10,957.8		0.317	0.037	0.040	0.641	0.000	0.395	
422.50	1.00	12,342.1		0.317	0.040	0.158	0.641	0.000	0.514	
422.60	1.10	13,755.3		0.317	0.042	0.439	0.641	0.000	0.798	Weir
422.70	1.20	15,197.7		0.317	0.044	0.689	0.641	0.000	0.958	
422.80	1.30	16,669.4		0.317			0.641	0.656	1.614	
422.90	1.40	18,170.6		0.317			0.641	1.888	2.846	
423.00	1.50	19,701.4		0.317			0.641	3.524	4.482	
423.10	1.60	21,262.0		0.317			0.641	5.502	6.460	Top of Pond
423.20	1.70	22,852.5		0.317			0.641	7.788	8.746	

Notes:

Major Controls - the minimum of flow over grate and pipe discharge flow rate is used in the actual discharge calculation

Knockout Controls - the knockout is assumed to contribute to discharge flow rates until the pipe discharge rate is the controlling release rate.

Major Control Pipe Flow - based on Pipe Capacity

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Uncon-Interim__25mm.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:20:21 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          367.000 Coefficient A"
"          5.000  Constant B"
"          0.700  Exponent C"
"          0.394  Fraction R"
"          120.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    72.993  mm/hr"
"          Total depth                        24.995  mm"
"          7  0025hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250 Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.007	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	3.071	0.370	2.655	minutes"
"		Time to Centroid	63.738	60.371	63.219	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	28.49	1.50	29.99	c.m"
"		Rainfall losses	19.084	4.536	18.356	mm"
"		Runoff depth	5.912	20.459	6.639	mm"
"		Runoff volume	6.74	1.23	7.97	c.m"
"		Runoff coefficient	0.237	0.819	0.266	"
"		Maximum flow	0.006	0.001	0.007	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.007	0.007	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.050	0.007	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	20.536	2.476	17.532	minutes"
"		Time to Centroid	82.465	63.135	79.250	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	410.80	21.62	432.42	c.m"
"		Rainfall losses	18.914	1.941	18.065	mm"
"		Runoff depth	6.082	23.054	6.930	mm"

"	Runoff volume	99.95	19.94	119.90	c.m"
"	Runoff coefficient	0.243	0.922	0.277	"
"	Maximum flow	0.047	0.013	0.050	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.050	0.052	0.000	0.000"	
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.129	0.052	0.000	0.000 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	90.569	10.921	87.585	minutes"
"	Time to Centroid	157.420	74.245	154.304	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	3662.32	36.99	3699.31	c.m"
"	Rainfall losses	18.910	1.543	18.736	mm"
"	Runoff depth	6.085	23.453	6.259	mm"
"	Runoff volume	891.61	34.71	926.32	c.m"
"	Runoff coefficient	0.243	0.938	0.250	"
"	Maximum flow	0.127	0.018	0.129	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.129	0.137	0.000	0.000"	
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	100	Catchment 100"				
"	80.000	% Impervious"				
"	13.090	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	2.618	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	10.472	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		1.552 0.137 0.000 0.000 c.m/sec"				
"		Catchment 100 Pervious Impervious Total Area "				
"		Surface Area 2.618 10.472 13.090 hectare"				
"		Time of concentration 24.798 2.990 4.336 minutes"				
"		Time to Centroid 87.039 63.901 65.330 minutes"				
"		Rainfall depth 24.995 24.995 24.995 mm"				
"		Rainfall volume 654.38 2617.51 3271.89 c.m"				
"		Rainfall losses 18.913 1.889 5.294 mm"				
"		Runoff depth 6.082 23.106 19.701 mm"				
"		Runoff volume 159.22 2419.69 2578.92 c.m"				
"		Runoff coefficient 0.243 0.924 0.788 "				
"		Maximum flow 0.069 1.550 1.552 c.m/sec"				
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		1.552 1.581 0.000 0.000"				
" 33		CATCHMENT 200"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	200	Catchment 200"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				

"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.056	1.581	0.000	0.000 c.m/sec"	
"		Catchment 200	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	24.798	2.990	16.045	minutes"
"		Time to Centroid	87.039	63.901	77.753	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	429.17	75.74	504.91	c.m"
"		Rainfall losses	18.913	1.889	16.360	mm"
"		Runoff depth	6.082	23.106	8.636	mm"
"		Runoff volume	104.43	70.01	174.44	c.m"
"		Runoff coefficient	0.243	0.924	0.345	"
"		Maximum flow	0.045	0.045	0.056	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.056	1.628	0.000	0.000"	
" 33		CATCHMENT 400"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	400	Catchment 400"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.056	1.628	0.000	0.000 c.m/sec"	
"		Catchment 400	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	42.448	5.118	42.448	minutes"
"		Time to Centroid	105.920	66.672	105.919	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	832.34	0.00	832.34	c.m"
"		Rainfall losses	18.910	1.665	18.910	mm"
"		Runoff depth	6.085	23.330	6.085	mm"
"		Runoff volume	202.64	0.00	202.64	c.m"
"		Runoff coefficient	0.243	0.000	0.243	"
"		Maximum flow	0.056	0.000	0.056	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.056	1.629	0.000	0.000"	
" 33		CATCHMENT 300"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	300	Catchment 300"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.121	1.629	0.000	0.000 c.m/sec"	
"		Catchment 300	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	8.939	1.078	2.724	minutes"
"		Time to Centroid	70.037	61.193	63.045	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	168.72	168.72	337.44	c.m"
"		Rainfall losses	18.924	2.080	10.502	mm"
"		Runoff depth	6.071	22.916	14.493	mm"

"	Runoff volume	40.98	154.68	195.66	c.m"
"	Runoff coefficient	0.243	0.917	0.580	"
"	Maximum flow	0.031	0.118	0.121	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.121	1.750	0.000	0.000"	
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.044	1.750	0.000	0.000 c.m/sec"	
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	49.662	5.988	49.662	minutes"
"	Time to Centroid	113.637	67.835	113.637	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	744.86	0.00	744.86	c.m"
"	Rainfall losses	18.911	1.624	18.911	mm"
"	Runoff depth	6.084	23.371	6.084	mm"
"	Runoff volume	181.30	0.00	181.31	c.m"
"	Runoff coefficient	0.243	0.000	0.243	"
"	Maximum flow	0.044	0.000	0.044	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.044	1.751	0.000	0.000"	
" 38	START/RE-START TOTALS 700"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		11.691	hectare"	

"	Total % impervious	29.656"
" 19	EXIT"	

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Uncon-Interim__2yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:16:04 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          414.876 Coefficient A"
"          0.027  Constant B"
"          0.682  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          100.235  mm/hr"
"          Total depth                39.504  mm"
"          6  002hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.022	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.816	0.326	1.648	minutes"
"		Time to Centroid	104.196	112.311	105.112	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	45.03	2.37	47.40	c.m"
"		Rainfall losses	25.568	5.814	24.580	mm"
"		Runoff depth	13.936	33.690	14.924	mm"
"		Runoff volume	15.89	2.02	17.91	c.m"
"		Runoff coefficient	0.353	0.853	0.378	"
"		Maximum flow	0.021	0.001	0.022	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.022	0.022	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.163	0.022	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	12.141	2.181	10.914	minutes"
"		Time to Centroid	117.971	114.662	117.563	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	649.25	34.17	683.42	c.m"
"		Rainfall losses	25.401	1.860	24.224	mm"
"		Runoff depth	14.103	37.644	15.280	mm"

"	Runoff volume	231.78	32.56	264.34	c.m"
"	Runoff coefficient	0.357	0.953	0.387	"
"	Maximum flow	0.158	0.022	0.163	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.163	0.167	0.000	0.000"	
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.449	0.167	0.000	0.000 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	53.548	9.620	52.390	minutes"
"	Time to Centroid	172.894	126.382	171.669	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	5788.13	58.47	5846.59	c.m"
"	Rainfall losses	25.381	1.671	25.143	mm"
"	Runoff depth	14.123	37.833	14.361	mm"
"	Runoff volume	2069.36	55.99	2125.36	c.m"
"	Runoff coefficient	0.358	0.958	0.364	"
"	Maximum flow	0.445	0.030	0.449	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.449	0.481	0.000	0.000"	
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	100	Catchment 100"				
"	80.000	% Impervious"				
"	13.090	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	2.618	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	10.472	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		2.700 0.481 0.000 0.000 c.m/sec"				
"		Catchment 100 Pervious Impervious Total Area "				
"		Surface Area 2.618 10.472 13.090 hectare"				
"		Time of concentration 14.661 2.634 3.668 minutes"				
"		Time to Centroid 121.346 115.356 115.871 minutes"				
"		Rainfall depth 39.504 39.504 39.504 mm"				
"		Rainfall volume 1034.22 4136.86 5171.08 c.m"				
"		Rainfall losses 25.379 1.965 6.648 mm"				
"		Runoff depth 14.125 37.539 32.856 mm"				
"		Runoff volume 369.79 3931.05 4300.84 c.m"				
"		Runoff coefficient 0.358 0.950 0.832 "				
"		Maximum flow 0.236 2.644 2.700 c.m/sec"				
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		2.700 2.845 0.000 0.000"				
" 33		CATCHMENT 200"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	200	Catchment 200"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				

"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.170	2.845	0.000	0.000 c.m/sec"	
"		Catchment 200	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	14.661	2.634	10.821	minutes"
"		Time to Centroid	121.346	115.356	119.434	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	678.28	119.70	797.98	c.m"
"		Rainfall losses	25.379	1.965	21.867	mm"
"		Runoff depth	14.125	37.539	17.637	mm"
"		Runoff volume	242.53	113.74	356.27	c.m"
"		Runoff coefficient	0.358	0.950	0.446	"
"		Maximum flow	0.155	0.077	0.170	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.170	2.958	0.000	0.000"	
" 33		CATCHMENT 400"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	400	Catchment 400"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.193	2.958	0.000	0.000 c.m/sec"	
"		Catchment 400	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	25.097	4.509	25.096	minutes"
"		Time to Centroid	135.157	118.349	135.157	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	1315.48	0.00	1315.48	c.m"
"		Rainfall losses	25.393	1.692	25.393	mm"
"		Runoff depth	14.111	37.813	14.111	mm"
"		Runoff volume	469.88	0.00	469.89	c.m"
"		Runoff coefficient	0.357	0.000	0.357	"
"		Maximum flow	0.193	0.000	0.193	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.193	2.987	0.000	0.000"	
" 33		CATCHMENT 300"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	300	Catchment 300"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.228	2.987	0.000	0.000 c.m/sec"	
"		Catchment 300	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	5.285	0.949	2.157	minutes"
"		Time to Centroid	108.893	112.435	111.449	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	266.65	266.65	533.30	c.m"
"		Rainfall losses	25.407	2.971	14.189	mm"
"		Runoff depth	14.097	36.533	25.315	mm"

"	Runoff volume	95.16	246.59	341.75	c.m"
"	Runoff coefficient	0.357	0.925	0.641	"
"	Maximum flow	0.106	0.170	0.228	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.228	3.215	0.000	0.000"	
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.152	3.215	0.000	0.000 c.m/sec"	
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	29.362	5.275	29.362	minutes"
"	Time to Centroid	140.817	119.556	140.816	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	1177.22	0.00	1177.22	c.m"
"	Rainfall losses	25.383	1.653	25.383	mm"
"	Runoff depth	14.121	37.851	14.121	mm"
"	Runoff volume	420.82	0.00	420.82	c.m"
"	Runoff coefficient	0.357	0.000	0.357	"
"	Maximum flow	0.152	0.000	0.152	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.152	3.235	0.000	0.000"	
" 38	START/RE-START TOTALS 700"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		11.691	hectare"	

"	Total % impervious	29.656"
" 19	EXIT"	

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Uncon-Interim__5yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:14:12 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          544.711 Coefficient A"
"          0.021  Constant B"
"          0.686  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          130.581  mm/hr"
"          Total depth                50.743  mm"
"          6  005hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.035	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.618	0.293	1.500	minutes"
"		Time to Centroid	105.803	111.144	106.279	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	57.85	3.04	60.89	c.m"
"		Rainfall losses	27.440	7.450	26.440	mm"
"		Runoff depth	23.303	43.293	24.303	mm"
"		Runoff volume	26.57	2.60	29.16	c.m"
"		Runoff coefficient	0.459	0.853	0.479	"
"		Maximum flow	0.033	0.002	0.035	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.035	0.035	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.287	0.035	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	10.817	1.962	9.949	minutes"
"		Time to Centroid	118.405	113.377	117.912	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	833.96	43.89	877.85	c.m"
"		Rainfall losses	27.163	2.058	25.907	mm"
"		Runoff depth	23.580	48.685	24.835	mm"

"	Runoff volume	387.54	42.11	429.65	c.m"
"	Runoff coefficient	0.465	0.959	0.489	"
"	Maximum flow	0.272	0.029	0.287	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.287	0.305	0.000	0.000"	
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.818	0.305	0.000	0.000 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	47.706	8.654	46.903	minutes"
"	Time to Centroid	168.372	124.102	167.462	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	7434.86	75.10	7509.96	c.m"
"	Rainfall losses	27.127	1.696	26.873	mm"
"	Runoff depth	23.616	49.047	23.870	mm"
"	Runoff volume	3460.21	72.59	3532.80	c.m"
"	Runoff coefficient	0.465	0.967	0.470	"
"	Maximum flow	0.812	0.040	0.818	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.818	0.868	0.000	0.000"	
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	100	Catchment 100"				
"	80.000	% Impervious"				
"	13.090	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	2.618	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	10.472	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		3.616 0.868 0.000 0.000 c.m/sec"				
"		Catchment 100 Pervious Impervious Total Area "				
"		Surface Area 2.618 10.472 13.090 hectare"				
"		Time of concentration 13.062 2.369 3.518 minutes"				
"		Time to Centroid 121.452 114.097 114.887 minutes"				
"		Rainfall depth 50.743 50.743 50.743 mm"				
"		Rainfall volume 1328.45 5313.80 6642.25 c.m"				
"		Rainfall losses 27.259 1.941 7.004 mm"				
"		Runoff depth 23.484 48.802 43.739 mm"				
"		Runoff volume 614.82 5110.59 5725.39 c.m"				
"		Runoff coefficient 0.463 0.962 0.862 "				
"		Maximum flow 0.395 3.479 3.616 c.m/sec"				
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		3.616 3.901 0.000 0.000"				
" 33		CATCHMENT 200"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	200	Catchment 200"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				

"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.279	3.901	0.000	0.000 c.m/sec"	
"		Catchment 200	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	13.062	2.369	10.193	minutes"
"		Time to Centroid	121.452	114.097	119.479	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	871.26	153.75	1025.01	c.m"
"		Rainfall losses	27.259	1.941	23.461	mm"
"		Runoff depth	23.484	48.802	27.282	mm"
"		Runoff volume	403.22	147.87	551.10	c.m"
"		Runoff coefficient	0.463	0.962	0.538	"
"		Maximum flow	0.259	0.101	0.279	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.279	4.092	0.000	0.000"	
" 33		CATCHMENT 400"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	400	Catchment 400"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.356	4.092	0.000	0.000 c.m/sec"	
"		Catchment 400	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	22.359	4.056	22.359	minutes"
"		Time to Centroid	134.036	116.866	134.036	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	1689.74	0.00	1689.74	c.m"
"		Rainfall losses	27.188	2.068	27.188	mm"
"		Runoff depth	23.555	48.675	23.555	mm"
"		Runoff volume	784.37	0.00	784.38	c.m"
"		Runoff coefficient	0.464	0.000	0.464	"
"		Maximum flow	0.356	0.000	0.356	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.356	4.163	0.000	0.000"	
" 33		CATCHMENT 300"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	300	Catchment 300"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.347	4.163	0.000	0.000 c.m/sec"	
"		Catchment 300	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	4.708	0.854	2.132	minutes"
"		Time to Centroid	110.182	111.691	111.191	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	342.51	342.51	685.03	c.m"
"		Rainfall losses	27.326	3.537	15.432	mm"
"		Runoff depth	23.417	47.206	35.311	mm"

"	Runoff volume	158.07	318.64	476.70	c.m"
"	Runoff coefficient	0.461	0.930	0.696	"
"	Maximum flow	0.157	0.219	0.347	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.347	4.510	0.000	0.000"	
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.271	4.510	0.000	0.000 c.m/sec"	
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	26.159	4.745	26.159	minutes"
"	Time to Centroid	139.192	117.881	139.192	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	1512.14	0.00	1512.14	c.m"
"	Rainfall losses	27.134	1.694	27.134	mm"
"	Runoff depth	23.609	49.049	23.609	mm"
"	Runoff volume	703.54	0.00	703.54	c.m"
"	Runoff coefficient	0.465	0.000	0.465	"
"	Maximum flow	0.271	0.000	0.271	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.271	4.559	0.000	0.000"	
" 38	START/RE-START TOTALS 700"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		11.691	hectare"	

"	Total % impervious	29.656"
" 19	EXIT"	

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\"
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Uncon-Interim__10yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:11:51 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          627.308 Coefficient A"
"          0.014  Constant B"
"          0.687  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          150.154  mm/hr"
"          Total depth                58.119  mm"
"          6  010hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.043	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.525	0.278	1.424	minutes"
"		Time to Centroid	107.285	110.607	107.552	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	66.26	3.49	69.74	c.m"
"		Rainfall losses	28.307	8.539	27.318	mm"
"		Runoff depth	29.812	49.580	30.801	mm"
"		Runoff volume	33.99	2.97	36.96	c.m"
"		Runoff coefficient	0.513	0.853	0.530	"
"		Maximum flow	0.040	0.002	0.043	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.043	0.043	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.378	0.043	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	10.195	1.856	9.450	minutes"
"		Time to Centroid	119.343	112.794	118.758	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	955.19	50.27	1005.46	c.m"
"		Rainfall losses	28.125	2.227	26.830	mm"
"		Runoff depth	29.994	55.892	31.289	mm"

"	Runoff volume	492.95	48.35	541.29	c.m"
"	Runoff coefficient	0.516	0.962	0.538	"
"	Maximum flow	0.361	0.033	0.378	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.378	0.398	0.000	0.000"	
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	1.110	0.398	0.000	0.000 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	44.961	8.184	44.281	minutes"
"	Time to Centroid	167.191	123.105	166.375	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"
"	Rainfall volume	8515.60	86.02	8601.62	c.m"
"	Rainfall losses	27.876	1.659	27.613	mm"
"	Runoff depth	30.243	56.460	30.506	mm"
"	Runoff volume	4431.28	83.56	4514.84	c.m"
"	Runoff coefficient	0.520	0.971	0.525	"
"	Maximum flow	1.104	0.051	1.110	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	1.110	1.172	0.000	0.000"	
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	100	Catchment 100"				
"	80.000	% Impervious"				
"	13.090	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	2.618	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	10.472	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		4.219 1.172 0.000 0.000 c.m/sec"				
"		Catchment 100 Pervious Impervious Total Area "				
"		Surface Area 2.618 10.472 13.090 hectare"				
"		Time of concentration 12.310 2.241 3.433 minutes"				
"		Time to Centroid 122.261 113.547 114.579 minutes"				
"		Rainfall depth 58.119 58.119 58.119 mm"				
"		Rainfall volume 1521.56 6086.22 7607.78 c.m"				
"		Rainfall losses 27.960 1.991 7.185 mm"				
"		Runoff depth 30.159 56.128 50.934 mm"				
"		Runoff volume 789.57 5877.72 6667.29 c.m"				
"		Runoff coefficient 0.519 0.966 0.876 "				
"		Maximum flow 0.493 4.013 4.219 c.m/sec"				
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		4.219 4.634 0.000 0.000"				
" 33		CATCHMENT 200"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	200	Catchment 200"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				

"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.383	4.634	0.000	0.000 c.m/sec"	
"		Catchment 200	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	12.310	2.241	9.821	minutes"
"		Time to Centroid	122.261	113.547	120.106	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	997.90	176.10	1174.00	c.m"
"		Rainfall losses	27.960	1.991	24.065	mm"
"		Runoff depth	30.159	56.128	34.054	mm"
"		Runoff volume	517.83	170.07	687.90	c.m"
"		Runoff coefficient	0.519	0.966	0.586	"
"		Maximum flow	0.323	0.116	0.383	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.383	4.885	0.000	0.000"	
" 33		CATCHMENT 400"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	400	Catchment 400"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.455	4.885	0.000	0.000 c.m/sec"	
"		Catchment 400	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	21.072	3.836	21.072	minutes"
"		Time to Centroid	134.305	116.233	134.305	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	1935.36	0.00	1935.36	c.m"
"		Rainfall losses	27.871	2.469	27.871	mm"
"		Runoff depth	30.248	55.650	30.248	mm"
"		Runoff volume	1007.27	0.00	1007.27	c.m"
"		Runoff coefficient	0.520	0.000	0.520	"
"		Maximum flow	0.455	0.000	0.455	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.455	4.999	0.000	0.000"	
" 33		CATCHMENT 300"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	300	Catchment 300"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.424	4.999	0.000	0.000 c.m/sec"	
"		Catchment 300	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	4.437	0.808	2.102	minutes"
"		Time to Centroid	111.465	111.382	111.412	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	392.30	392.30	784.61	c.m"
"		Rainfall losses	28.094	3.950	16.022	mm"
"		Runoff depth	30.025	54.169	42.097	mm"

"	Runoff volume	202.67	365.64	568.30	c.m"
"	Runoff coefficient	0.517	0.932	0.724	"
"	Maximum flow	0.180	0.250	0.424	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.424	5.423	0.000	0.000"	
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.386	5.423	0.000	0.000 c.m/sec"	
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	24.654	4.487	24.654	minutes"
"	Time to Centroid	139.257	117.159	139.257	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"
"	Rainfall volume	1731.95	0.00	1731.95	c.m"
"	Rainfall losses	27.890	1.793	27.890	mm"
"	Runoff depth	30.229	56.326	30.229	mm"
"	Runoff volume	900.82	0.00	900.82	c.m"
"	Runoff coefficient	0.520	0.000	0.520	"
"	Maximum flow	0.386	0.000	0.386	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.386	5.501	0.000	0.000"	
" 38	START/RE-START TOTALS 700"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		11.691	hectare"	

"	Total % impervious	29.656"
" 19	EXIT"	

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Uncon-Interim__25yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:03:30 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          746.059 Coefficient A"
"          0.085  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          175.654  mm/hr"
"          Total depth                67.239  mm"
"          6  025hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.052	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.428	0.261	1.342	minutes"
"		Time to Centroid	108.971	109.975	109.045	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	76.65	4.03	80.69	c.m"
"		Rainfall losses	29.074	9.934	28.117	mm"
"		Runoff depth	38.165	57.305	39.122	mm"
"		Runoff volume	43.51	3.44	46.95	c.m"
"		Runoff coefficient	0.568	0.852	0.582	"
"		Maximum flow	0.049	0.003	0.052	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.052	0.052	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.496	0.052	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	9.548	1.743	8.915	minutes"
"		Time to Centroid	120.388	112.106	119.717	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	1105.07	58.16	1163.23	c.m"
"		Rainfall losses	28.570	2.417	27.262	mm"
"		Runoff depth	38.669	64.822	39.977	mm"

"	Runoff volume	635.52	56.07	691.59	c.m"
"	Runoff coefficient	0.575	0.964	0.595	"
"	Maximum flow	0.477	0.039	0.496	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.496	0.519	0.000	0.000"	
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	1.530	0.519	0.000	0.000 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	42.108	7.686	41.531	minutes"
"	Time to Centroid	165.819	121.852	165.082	minutes"
"	Rainfall depth	67.239	67.239	67.239	mm"
"	Rainfall volume	9851.84	99.51	9951.36	c.m"
"	Rainfall losses	28.384	1.687	28.117	mm"
"	Runoff depth	38.855	65.552	39.122	mm"
"	Runoff volume	5692.98	97.02	5789.99	c.m"
"	Runoff coefficient	0.578	0.975	0.582	"
"	Maximum flow	1.521	0.060	1.530	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	1.530	1.611	0.000	0.000"	
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	100	Catchment 100"				
"	80.000	% Impervious"				
"	13.090	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	2.618	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	10.472	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		5.040 1.611 0.000 0.000 c.m/sec"				
"		Catchment 100 Pervious Impervious Total Area "				
"		Surface Area 2.618 10.472 13.090 hectare"				
"		Time of concentration 11.529 2.104 3.326 minutes"				
"		Time to Centroid 123.146 112.845 114.181 minutes"				
"		Rainfall depth 67.239 67.239 67.239 mm"				
"		Rainfall volume 1760.31 7041.26 8801.57 c.m"				
"		Rainfall losses 28.447 2.145 7.405 mm"				
"		Runoff depth 38.792 65.094 59.834 mm"				
"		Runoff volume 1015.58 6816.63 7832.21 c.m"				
"		Runoff coefficient 0.577 0.968 0.890 "				
"		Maximum flow 0.662 4.705 5.040 c.m/sec"				
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		5.040 5.657 0.000 0.000"				
" 33		CATCHMENT 200"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	200	Catchment 200"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				

"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.509	5.657	0.000	0.000 c.m/sec"	
"		Catchment 200	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	11.529	2.104	9.376	minutes"
"		Time to Centroid	123.146	112.845	120.792	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	1154.49	203.73	1358.23	c.m"
"		Rainfall losses	28.447	2.145	24.501	mm"
"		Runoff depth	38.792	65.094	42.738	mm"
"		Runoff volume	666.07	197.23	863.30	c.m"
"		Runoff coefficient	0.577	0.968	0.636	"
"		Maximum flow	0.434	0.136	0.509	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.509	6.013	0.000	0.000"	
" 33		CATCHMENT 400"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	400	Catchment 400"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.607	6.013	0.000	0.000 c.m/sec"	
"		Catchment 400	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	19.735	3.602	19.735	minutes"
"		Time to Centroid	134.608	115.438	134.608	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	2239.05	0.00	2239.06	c.m"
"		Rainfall losses	28.441	2.959	28.441	mm"
"		Runoff depth	38.798	64.280	38.798	mm"
"		Runoff volume	1291.97	0.00	1291.97	c.m"
"		Runoff coefficient	0.577	0.000	0.577	"
"		Maximum flow	0.607	0.000	0.607	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.607	6.195	0.000	0.000"	
" 33		CATCHMENT 300"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	300	Catchment 300"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.525	6.195	0.000	0.000 c.m/sec"	
"		Catchment 300	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	4.156	0.759	2.050	minutes"
"		Time to Centroid	112.936	110.977	111.722	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	453.86	453.86	907.73	c.m"
"		Rainfall losses	28.833	4.588	16.711	mm"
"		Runoff depth	38.406	62.651	50.528	mm"

"	Runoff volume	259.24	422.89	682.13	c.m"
"	Runoff coefficient	0.571	0.932	0.751	"
"	Maximum flow	0.234	0.291	0.525	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.525	6.720	0.000	0.000"	
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.500	6.720	0.000	0.000 c.m/sec"	
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	23.089	4.215	23.089	minutes"
"	Time to Centroid	139.283	116.269	139.283	minutes"
"	Rainfall depth	67.239	67.239	67.239	mm"
"	Rainfall volume	2003.72	0.00	2003.72	c.m"
"	Rainfall losses	28.407	2.068	28.407	mm"
"	Runoff depth	38.832	65.171	38.832	mm"
"	Runoff volume	1157.20	0.00	1157.21	c.m"
"	Runoff coefficient	0.578	0.000	0.578	"
"	Maximum flow	0.500	0.000	0.500	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.500	6.845	0.000	0.000"	
" 38	START/RE-START TOTALS 700"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		11.691	hectare"	

"	Total % impervious	29.656"
" 19	EXIT"	

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Uncon-Interim__50yr.out"
"          Licensee name:                     "
"          Company                             "
"          Date & Time last used:              2/5/2025 at 2:00:47 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          820.361 Coefficient A"
"          0.010  Constant B"
"          0.691  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          194.803  mm/hr"
"          Total depth                74.358  mm"
"          6  050hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.058	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.368	0.250	1.290	minutes"
"		Time to Centroid	110.205	109.690	110.169	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	84.77	4.46	89.23	c.m"
"		Rainfall losses	29.637	11.032	28.707	mm"
"		Runoff depth	44.721	63.326	45.651	mm"
"		Runoff volume	50.98	3.80	54.78	c.m"
"		Runoff coefficient	0.601	0.852	0.614	"
"		Maximum flow	0.055	0.003	0.058	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.058	0.058	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.580	0.058	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	9.147	1.672	8.573	minutes"
"		Time to Centroid	121.402	111.843	120.668	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	1222.07	64.32	1286.39	c.m"
"		Rainfall losses	28.890	2.541	27.572	mm"
"		Runoff depth	45.468	71.816	46.785	mm"

"	Runoff volume	747.27	62.12	809.39	c.m"
"	Runoff coefficient	0.611	0.966	0.629	"
"	Maximum flow	0.558	0.043	0.580	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.580	0.604	0.000	0.000"	
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	1.817	0.604	0.000	0.000 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	40.339	7.374	39.818	minutes"
"	Time to Centroid	166.075	121.211	165.366	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"
"	Rainfall volume	1.0895	0.0110	1.1005	ha-m"
"	Rainfall losses	28.716	1.802	28.447	mm"
"	Runoff depth	45.642	72.556	45.911	mm"
"	Runoff volume	6687.42	107.38	6794.80	c.m"
"	Runoff coefficient	0.614	0.976	0.617	"
"	Maximum flow	1.807	0.066	1.817	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	1.817	1.914	0.000	0.000"	
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	100	Catchment 100"				
"	80.000	% Impervious"				
"	13.090	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	2.618	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	10.472	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		5.638	1.914	0.000	0.000 c.m/sec"	
"		Catchment 100	Pervious	Impervious	Total Area	"
"		Surface Area	2.618	10.472	13.090	hectare"
"		Time of concentration	11.045	2.019	3.250	minutes"
"		Time to Centroid	124.131	112.509	114.093	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	1946.69	7786.75	9733.44	c.m"
"		Rainfall losses	28.840	2.269	7.583	mm"
"		Runoff depth	45.518	72.088	66.774	mm"
"		Runoff volume	1191.65	7549.11	8740.76	c.m"
"		Runoff coefficient	0.612	0.969	0.898	"
"		Maximum flow	0.783	5.218	5.638	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		5.638	6.392	0.000	0.000"	
" 33		CATCHMENT 200"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	200	Catchment 200"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				

"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.595	6.392	0.000	0.000 c.m/sec"	
"		Catchment 200	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	11.045	2.019	9.073	minutes"
"		Time to Centroid	124.131	112.509	121.592	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	1276.72	225.30	1502.03	c.m"
"		Rainfall losses	28.840	2.269	24.855	mm"
"		Runoff depth	45.518	72.088	49.503	mm"
"		Runoff volume	781.54	218.43	999.97	c.m"
"		Runoff coefficient	0.612	0.969	0.666	"
"		Maximum flow	0.514	0.151	0.595	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.595	6.819	0.000	0.000"	
" 33		CATCHMENT 400"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	400	Catchment 400"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.720	6.819	0.000	0.000 c.m/sec"	
"		Catchment 400	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	18.906	3.456	18.906	minutes"
"		Time to Centroid	135.377	115.016	135.377	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	2476.11	0.00	2476.11	c.m"
"		Rainfall losses	28.813	3.112	28.813	mm"
"		Runoff depth	45.544	71.246	45.544	mm"
"		Runoff volume	1516.63	0.00	1516.63	c.m"
"		Runoff coefficient	0.613	0.000	0.613	"
"		Maximum flow	0.720	0.000	0.720	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.720	7.048	0.000	0.000"	
" 33		CATCHMENT 300"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	300	Catchment 300"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.597	7.048	0.000	0.000 c.m/sec"	
"		Catchment 300	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	3.981	0.728	2.007	minutes"
"		Time to Centroid	114.123	110.827	112.123	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	501.92	501.92	1003.83	c.m"
"		Rainfall losses	29.474	5.085	17.279	mm"
"		Runoff depth	44.884	69.273	57.079	mm"

"	Runoff volume	302.97	467.59	770.56	c.m"
"	Runoff coefficient	0.604	0.932	0.768	"
"	Maximum flow	0.276	0.321	0.597	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.597	7.645	0.000	0.000"	
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.575	7.645	0.000	0.000 c.m/sec"	
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	22.119	4.044	22.119	minutes"
"	Time to Centroid	139.988	115.872	139.988	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"
"	Rainfall volume	2215.86	0.00	2215.86	c.m"
"	Rainfall losses	28.813	2.354	28.812	mm"
"	Runoff depth	45.545	72.004	45.545	mm"
"	Runoff volume	1357.25	0.00	1357.25	c.m"
"	Runoff coefficient	0.613	0.000	0.613	"
"	Maximum flow	0.575	0.000	0.575	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.575	7.802	0.000	0.000"	
" 38	START/RE-START TOTALS 700"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		11.691	hectare"	

"	Total % impervious	29.656"
" 19	EXIT"	

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Uncon-Interim_100yr.out"
"          Licensee name:                     "
"          Company                             "
"          Date & Time last used:              2/5/2025 at 1:58:41 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          901.088  Coefficient A"
"          0.043  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          212.921  mm/hr"
"          Total depth                81.221  mm"
"          6  100hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000  Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000  Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.063	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.319	0.241	1.247	minutes"
"		Time to Centroid	110.908	109.390	110.807	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	92.59	4.87	97.46	c.m"
"		Rainfall losses	30.156	12.072	29.251	mm"
"		Runoff depth	51.065	69.148	51.969	mm"
"		Runoff volume	58.21	4.15	62.36	c.m"
"		Runoff coefficient	0.629	0.851	0.640	"
"		Maximum flow	0.060	0.003	0.063	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.063	0.063	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.664	0.063	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	8.817	1.614	8.287	minutes"
"		Time to Centroid	121.743	111.617	120.997	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	1334.86	70.26	1405.12	c.m"
"		Rainfall losses	29.209	2.686	27.883	mm"
"		Runoff depth	52.011	78.534	53.337	mm"

"	Runoff volume	854.81	67.93	922.74	c.m"
"	Runoff coefficient	0.640	0.967	0.657	"
"	Maximum flow	0.641	0.047	0.664	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.664 0.691 0.000 0.000"				
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	2.059 0.691 0.000 0.000 c.m/sec"				
"	Catchment 500 Pervious Impervious Total Area "				
"	Surface Area 14.652 0.148 14.800 hectare"				
"	Time of concentration 38.886 7.117 38.407 minutes"				
"	Time to Centroid 165.000 120.685 164.331 minutes"				
"	Rainfall depth 81.221 81.221 81.221 mm"				
"	Rainfall volume 1.1900 0.0120 1.2021 ha-m"				
"	Rainfall losses 28.976 1.949 28.706 mm"				
"	Runoff depth 52.245 79.272 52.515 mm"				
"	Runoff volume 7654.90 117.32 7772.23 c.m"				
"	Runoff coefficient 0.643 0.976 0.647 "				
"	Maximum flow 2.048 0.072 2.059 c.m/sec"				
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	2.059 2.166 0.000 0.000"				
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	100	Catchment 100"				
"	80.000	% Impervious"				
"	13.090	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	2.618	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	10.472	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		6.208	2.166	0.000	0.000 c.m/sec"	
"		Catchment 100	Pervious	Impervious	Total Area	"
"		Surface Area	2.618	10.472	13.090	hectare"
"		Time of concentration	10.647	1.949	3.182	minutes"
"		Time to Centroid	124.365	112.180	113.907	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	0.2126	0.8505	1.0632	ha-m"
"		Rainfall losses	29.139	2.392	7.742	mm"
"		Runoff depth	52.082	78.828	73.479	mm"
"		Runoff volume	1363.51	8254.90	9618.41	c.m"
"		Runoff coefficient	0.641	0.971	0.905	"
"		Maximum flow	0.912	5.702	6.208	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		6.208	7.107	0.000	0.000"	
" 33		CATCHMENT 200"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	200	Catchment 200"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				

"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.686	7.107	0.000	0.000 c.m/sec"	
"		Catchment 200	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	10.647	1.949	8.813	minutes"
"		Time to Centroid	124.365	112.180	121.796	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	1394.56	246.10	1640.66	c.m"
"		Rainfall losses	29.139	2.392	25.127	mm"
"		Runoff depth	52.082	78.828	56.094	mm"
"		Runoff volume	894.25	238.85	1133.10	c.m"
"		Runoff coefficient	0.641	0.971	0.691	"
"		Maximum flow	0.598	0.165	0.686	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.686	7.604	0.000	0.000"	
" 33		CATCHMENT 400"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	400	Catchment 400"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.835	7.604	0.000	0.000 c.m/sec"	
"		Catchment 400	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	18.225	3.335	18.225	minutes"
"		Time to Centroid	135.263	114.631	135.263	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	2704.65	0.00	2704.65	c.m"
"		Rainfall losses	28.982	3.311	28.982	mm"
"		Runoff depth	52.239	77.910	52.239	mm"
"		Runoff volume	1739.55	0.00	1739.55	c.m"
"		Runoff coefficient	0.643	0.000	0.643	"
"		Maximum flow	0.835	0.000	0.835	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.835	7.881	0.000	0.000"	
" 33		CATCHMENT 300"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	300	Catchment 300"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.665	7.881	0.000	0.000 c.m/sec"	
"		Catchment 300	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	3.838	0.702	1.967	minutes"
"		Time to Centroid	114.744	110.663	112.310	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	548.24	548.24	1096.48	c.m"
"		Rainfall losses	30.089	5.611	17.850	mm"
"		Runoff depth	51.132	75.610	63.371	mm"

"	Runoff volume	345.14	510.37	855.51	c.m"
"	Runoff coefficient	0.630	0.931	0.780	"
"	Maximum flow	0.315	0.350	0.665	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.665	8.546	0.000	0.000"	
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.652	8.546	0.000	0.000 c.m/sec"	
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	21.323	3.902	21.323	minutes"
"	Time to Centroid	139.735	115.505	139.735	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"
"	Rainfall volume	2420.38	0.00	2420.38	c.m"
"	Rainfall losses	28.988	2.703	28.988	mm"
"	Runoff depth	52.233	78.518	52.233	mm"
"	Runoff volume	1556.54	0.00	1556.55	c.m"
"	Runoff coefficient	0.643	0.000	0.643	"
"	Maximum flow	0.652	0.000	0.652	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.652	8.737	0.000	0.000"	
" 38	START/RE-START TOTALS 700"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		11.691	hectare"	

"	Total % impervious	29.656"
" 19	EXIT"	

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Uuncon-Interim__REG.out"
"          Licensee name:                     "
"          Company                             "
"          Date & Time last used:              2/5/2025 at 1:53:57 PM"
" 31      TIME PARAMETERS"
"          60.000  Time Step"
"          2880.000  Max. Storm length"
"          7500.000  Max. Hydrograph"
" 32      STORM Historic"
"          5  Historic"
"          2880.000  Duration"
"          48.000  Rainfall intensity values"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.026      2.026      2.026      2.028"
"                  2.026      6.000      4.000      6.000      13.000"
"                  17.000      13.000      23.000      13.000      13.000"
"                  53.000      38.000      13.000"
"          Maximum intensity                    53.000      mm/hr"
"          Total depth                          285.000      mm"
"          6  000hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000  Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000  Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"

```

"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.014	0.000	0.000	0.000 c.m/sec"
"		Catchment 600	Pervious	Impervious	Total Area "
"		Surface Area	0.114	0.006	0.120 hectare"
"		Time of concentration	2.369	0.421	2.184 minutes"
"		Time to Centroid	2699.991	2271.478	2659.445 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	324.90	17.10	342.00 c.m"
"		Rainfall losses	157.980	32.780	151.720 mm"
"		Runoff depth	127.020	252.220	133.280 mm"
"		Runoff volume	144.80	15.13	159.94 c.m"
"		Runoff coefficient	0.446	0.885	0.468 "
"		Maximum flow	0.013	0.001	0.014 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.014	0.014	0.000	0.000"
" 33		CATCHMENT 800"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	800	Catchment 800"			
"	5.000	% Impervious"			
"	1.730	Total Area"			
"	40.000	Flow length"			
"	3.750	Overland Slope"			
"	1.643	Pervious Area"			
"	40.000	Pervious length"			
"	3.750	Pervious slope"			
"	0.087	Impervious Area"			
"	40.000	Impervious length"			
"	3.750	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.182	0.014	0.000	0.000 c.m/sec"
"		Catchment 800	Pervious	Impervious	Total Area "
"		Surface Area	1.643	0.087	1.730 hectare"

"	Time of concentration	15.838	2.814	14.776	minutes"
"	Time to Centroid	2719.829	2252.474	2681.705	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	4683.98	246.53	4930.50	c.m"
"	Rainfall losses	139.630	39.672	134.632	mm"
"	Runoff depth	145.370	245.328	150.368	mm"
"	Runoff volume	2389.15	212.21	2601.36	c.m"
"	Runoff coefficient	0.510	0.861	0.528	"
"	Maximum flow	0.171	0.011	0.182	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.182 0.196 0.000 0.000"				
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.010 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	1.470 0.196 0.000 0.000 c.m/sec"				
"	Catchment 500 Pervious Impervious Total Area "				
"	Surface Area 14.652 0.148 14.800 hectare"				
"	Time of concentration 69.853 12.412 68.788 minutes"				
"	Time to Centroid 2777.725 2293.749 2768.751 minutes"				
"	Rainfall depth 285.000 285.000 285.000 mm"				
"	Rainfall volume 4.1758 0.0422 4.2180 ha-m"				
"	Rainfall losses 138.578 11.153 137.304 mm"				
"	Runoff depth 146.422 273.847 147.696 mm"				
"	Runoff volume 2.1454 0.0405 2.1859 ha-m"				
"	Runoff coefficient 0.514 0.961 0.518 "				
"	Maximum flow 1.454 0.018 1.470 c.m/sec"				
" 40	HYDROGRAPH Add Runoff "				

"	4	Add Runoff "				
"		1.470	1.647	0.000	0.000"	
" 33		CATCHMENT 100"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	100	Catchment 100"				
"	80.000	% Impervious"				
"	13.090	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	2.618	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	10.472	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.010	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		1.584	1.647	0.000	0.000 c.m/sec"	
"		Catchment 100	Pervious	Impervious	Total Area	"
"		Surface Area	2.618	10.472	13.090	hectare"
"		Time of concentration	19.125	3.398	5.426	minutes"
"		Time to Centroid	2724.073	2240.650	2302.975	minutes"
"		Rainfall depth	285.000	285.000	285.000	mm"
"		Rainfall volume	0.7461	2.9845	3.7307	ha-m"
"		Rainfall losses	139.363	39.000	59.073	mm"
"		Runoff depth	145.637	246.000	225.927	mm"
"		Runoff volume	0.3813	2.5761	2.9574	ha-m"
"		Runoff coefficient	0.511	0.863	0.793	"
"		Maximum flow	0.264	1.323	1.584	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		1.584	2.853	0.000	0.000"	
" 33		CATCHMENT 200"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	200	Catchment 200"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				

"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.010	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.210	2.853	0.000	0.000 c.m/sec"	
"		Catchment 200	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	19.125	3.398	15.514	minutes"
"		Time to Centroid	2724.073	2240.650	2613.063	minutes"
"		Rainfall depth	285.000	285.000	285.000	mm"
"		Rainfall volume	4893.45	863.55	5757.00	c.m"
"		Rainfall losses	139.363	39.000	124.309	mm"
"		Runoff depth	145.637	246.000	160.691	mm"
"		Runoff volume	2500.58	745.38	3245.96	c.m"
"		Runoff coefficient	0.511	0.863	0.564	"
"		Maximum flow	0.173	0.038	0.210	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.210	3.053	0.000	0.000"	
" 33		CATCHMENT 400"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	400	Catchment 400"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				

"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.366	3.053	0.000	0.000 c.m/sec"
"		Catchment 400	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	32.738	5.817	32.738 minutes"
"		Time to Centroid	2737.685	2233.111	2737.684 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	9490.49	0.01	9490.50 c.m"
"		Rainfall losses	139.700	29.327	139.699 mm"
"		Runoff depth	145.300	255.673	145.301 mm"
"		Runoff volume	4838.50	0.01	4838.51 c.m"
"		Runoff coefficient	0.510	0.000	0.510 "
"		Maximum flow	0.366	0.000	0.366 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.366	3.419	0.000	0.000"
" 33		CATCHMENT 300"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	300	Catchment 300"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.165	3.419	0.000	0.000 c.m/sec"
"		Catchment 300	Pervious	Impervious	Total Area "
"		Surface Area	0.675	0.675	1.350 hectare"

"	Time of concentration	6.894	1.225	3.197	minutes"
"	Time to Centroid	2702.037	2279.380	2426.416	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	1923.75	1923.75	3847.50	c.m"
"	Rainfall losses	153.479	38.462	95.970	mm"
"	Runoff depth	131.521	246.538	189.030	mm"
"	Runoff volume	887.77	1664.13	2551.90	c.m"
"	Runoff coefficient	0.461	0.865	0.663	"
"	Maximum flow	0.077	0.088	0.165	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.165	3.533	0.000	0.000"
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.010 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.327	3.533	0.000	0.000 c.m/sec"
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	38.303	6.806	38.303	minutes"
"	Time to Centroid	2741.219	2241.541	2741.218	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	8492.99	0.01	8493.00	c.m"
"	Rainfall losses	141.568	24.635	141.568	mm"
"	Runoff depth	143.432	260.365	143.432	mm"
"	Runoff volume	4274.27	0.01	4274.27	c.m"
"	Runoff coefficient	0.503	0.000	0.503	"
"	Maximum flow	0.327	0.000	0.327	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				

"	4	Add Runoff "				
"		0.327	3.860	0.000	0.000"	
" 38		START/RE-START TOTALS 700"				
"	3	Runoff Totals on EXIT"				
"		Total Catchment area		39.420	hectare"	
"		Total Impervious area		11.691	hectare"	
"		Total % impervious		29.656"		
" 19		EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Interim__25mm.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 11:29:30 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          367.000 Coefficient A"
"          5.000  Constant B"
"          0.700  Exponent C"
"          0.394  Fraction R"
"          120.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                    72.993  mm/hr"
"          Total depth                        24.995  mm"
"          7  0025hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250 Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.007	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	3.071	0.370	2.655	minutes"
"		Time to Centroid	63.738	60.371	63.219	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	28.49	1.50	29.99	c.m"
"		Rainfall losses	19.084	4.536	18.356	mm"
"		Runoff depth	5.912	20.459	6.639	mm"
"		Runoff volume	6.74	1.23	7.97	c.m"
"		Runoff coefficient	0.237	0.819	0.266	"
"		Maximum flow	0.006	0.001	0.007	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.007	0.007	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.050	0.007	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	20.536	2.476	17.532	minutes"
"		Time to Centroid	82.465	63.135	79.250	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	410.80	21.62	432.42	c.m"
"		Rainfall losses	18.914	1.941	18.065	mm"
"		Runoff depth	6.082	23.054	6.930	mm"

"	Runoff volume	99.95	19.94	119.90	c.m"
"	Runoff coefficient	0.243	0.922	0.277	"
"	Maximum flow	0.047	0.013	0.050	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.050 0.052 0.000 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.050 0.052 0.052 0.000"				
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.052			c.m/sec"
"	Hydrograph volume	127.862			c.m"
"	0.050 0.052 0.052 0.052"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.050 0.000 0.052 0.052"				
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.129 0.000 0.052 0.052 c.m/sec"				
"	Catchment 500 Pervious Impervious Total Area "				
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	90.569	10.921	87.585	minutes"
"	Time to Centroid	157.420	74.245	154.304	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"

"	Rainfall volume	3662.32	36.99	3699.31	c.m"
"	Rainfall losses	18.910	1.543	18.736	mm"
"	Runoff depth	6.085	23.453	6.259	mm"
"	Runoff volume	891.61	34.71	926.32	c.m"
"	Runoff coefficient	0.243	0.938	0.250	"
"	Maximum flow	0.127	0.018	0.129	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.129	0.129	0.052	0.052"
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	100 Catchment 100"				
"	80.000 % Impervious"				
"	13.090 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	2.618 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	10.472 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		1.552	0.129	0.052	0.052 c.m/sec"
"	Catchment 100	Pervious	Impervious	Total Area	"
"	Surface Area	2.618	10.472	13.090	hectare"
"	Time of concentration	24.798	2.990	4.336	minutes"
"	Time to Centroid	87.039	63.901	65.330	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	654.38	2617.51	3271.89	c.m"
"	Rainfall losses	18.913	1.889	5.294	mm"
"	Runoff depth	6.082	23.106	19.701	mm"
"	Runoff volume	159.22	2419.69	2578.92	c.m"
"	Runoff coefficient	0.243	0.924	0.788	"
"	Maximum flow	0.069	1.550	1.552	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		1.552	1.562	0.052	0.052"
" 33	CATCHMENT 200"				


```

"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"      200   Catchment 200"
"    15.000   % Impervious"
"      2.020   Total Area"
"    40.000   Flow length"
"      2.000   Overland Slope"
"      1.717   Pervious Area"
"    40.000   Pervious length"
"      2.000   Pervious slope"
"      0.303   Impervious Area"
"    40.000   Impervious length"
"      2.000   Impervious slope"
"      0.250   Pervious Manning 'n'"
"    30.000   Pervious Max.infiltration"
"      5.000   Pervious Min.infiltration"
"      0.250   Pervious Lag constant (hours)"
"      5.000   Pervious Depression storage"
"      0.015   Impervious Manning 'n'"
"      0.000   Impervious Max.infiltration"
"      0.000   Impervious Min.infiltration"
"      0.001   Impervious Lag constant (hours)"
"      1.500   Impervious Depression storage"
"
"          0.056      1.562      0.052      0.052 c.m/sec"
"      Catchment 200      Pervious      Impervious Total Area "
"      Surface Area      1.717      0.303      2.020      hectare"
"      Time of concentration 24.798      2.990      16.045      minutes"
"      Time to Centroid      87.039      63.901      77.753      minutes"
"      Rainfall depth      24.995      24.995      24.995      mm"
"      Rainfall volume      429.17      75.74      504.91      c.m"
"      Rainfall losses      18.913      1.889      16.360      mm"
"      Runoff depth      6.082      23.106      8.636      mm"
"      Runoff volume      104.43      70.01      174.44      c.m"
"      Runoff coefficient      0.243      0.924      0.345      "
"      Maximum flow      0.045      0.045      0.056      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"
"          0.056      1.609      0.052      0.052"
" 54      POND DESIGN"
"      1.609      Current peak flow      c.m/sec"
"      3.341      Target outflow      c.m/sec"
"      3679.7      Hydrograph volume      c.m"
"      18.      Number of stages"
"      421.500      Minimum water level      metre"
"      423.200      Maximum water level      metre"
"      421.500      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"      421.500      0.000      0.000"

```

"	421.600	0.00700	1070.100"		
"	421.700	0.01300	2176.600"		
"	421.800	0.01900	3319.800"		
"	421.900	0.02300	4500.000"		
"	422.000	0.02600	5717.200"		
"	422.100	0.07100	6977.200"		
"	422.200	0.1940	8275.500"		
"	422.300	0.3520	9602.300"		
"	422.400	0.3950	10957.80"		
"	422.500	0.5140	12342.10"		
"	422.600	0.7980	13755.30"		
"	422.700	0.9580	15197.70"		
"	422.800	1.614	16669.40"		
"	422.900	2.846	18170.60"		
"	423.000	4.482	19701.40"		
"	423.100	6.460	21262.00"		
"	423.200	8.746	22852.50"		
"	Peak outflow	0.019	c.m/sec"		
"	Maximum level	421.807	metre"		
"	Maximum storage	3397.904	c.m"		
"	Centroidal lag	40.318	hours"		
"	0.056	1.609	0.019	0.052	c.m/sec"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.056	0.019	0.019	0.052"	
" 33	CATCHMENT 400"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	400 Catchment 400"				
"	0.000 % Impervious"				
"	3.330 Total Area"				
"	120.000 Flow length"				
"	3.000 Overland Slope"				
"	3.330 Pervious Area"				
"	120.000 Pervious length"				
"	3.000 Pervious slope"				
"	0.000 Impervious Area"				
"	120.000 Impervious length"				
"	3.000 Impervious slope"				
"	0.250 Pervious Manning 'n' "				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n' "				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

	0.056	0.019	0.019	0.052 c.m/sec"	
"	Catchment 400	Pervious	Impervious	Total Area	"
"	Surface Area	3.330	0.000	3.330	hectare"
"	Time of concentration	42.448	5.118	42.448	minutes"
"	Time to Centroid	105.920	66.672	105.919	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	832.34	0.00	832.34	c.m"
"	Rainfall losses	18.910	1.665	18.910	mm"
"	Runoff depth	6.085	23.330	6.085	mm"
"	Runoff volume	202.64	0.00	202.64	c.m"
"	Runoff coefficient	0.243	0.000	0.243	"
"	Maximum flow	0.056	0.000	0.056	c.m/sec"

" 40 HYDROGRAPH Add Runoff "

" 4 Add Runoff "

	0.056	0.069	0.019	0.052"
--	-------	-------	-------	--------

" 33 CATCHMENT 300"

"	1	Triangular SCS"
"	1	Equal length"
"	2	Horton equation"
"	300	Catchment 300"
"	50.000	% Impervious"
"	1.350	Total Area"
"	20.000	Flow length"
"	15.000	Overland Slope"
"	0.675	Pervious Area"
"	20.000	Pervious length"
"	15.000	Pervious slope"
"	0.675	Impervious Area"
"	20.000	Impervious length"
"	15.000	Impervious slope"
"	0.250	Pervious Manning 'n'"
"	30.000	Pervious Max.infiltration"
"	5.000	Pervious Min.infiltration"
"	0.250	Pervious Lag constant (hours)"
"	5.000	Pervious Depression storage"
"	0.015	Impervious Manning 'n'"
"	0.000	Impervious Max.infiltration"
"	0.000	Impervious Min.infiltration"
"	0.001	Impervious Lag constant (hours)"
"	1.500	Impervious Depression storage"

	0.121	0.069	0.019	0.052 c.m/sec"
--	-------	-------	-------	----------------

"	Catchment 300	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	8.939	1.078	2.724	minutes"
"	Time to Centroid	70.037	61.193	63.045	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	168.72	168.72	337.44	c.m"
"	Rainfall losses	18.924	2.080	10.502	mm"
"	Runoff depth	6.071	22.916	14.493	mm"
"	Runoff volume	40.98	154.68	195.66	c.m"

"	Runoff coefficient	0.243	0.917	0.580	"
"	Maximum flow	0.031	0.118	0.121	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.121 0.127 0.019 0.052"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.121 0.127 0.127 0.052"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	0.127		c.m/sec"	
"	Hydrograph volume	2200.568		c.m"	
"	0.121 0.127 0.127 0.127"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.121 0.000 0.127 0.127"				
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.044 0.000 0.127 0.127 c.m/sec"				
"	Catchment 700 Pervious Impervious Total Area "				
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	49.662	5.988	49.662	minutes"
"	Time to Centroid	113.637	67.835	113.637	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	744.86	0.00	744.86	c.m"

"	Rainfall losses	18.911	1.624	18.911	mm"
"	Runoff depth	6.084	23.371	6.084	mm"
"	Runoff volume	181.30	0.00	181.31	c.m"
"	Runoff coefficient	0.243	0.000	0.243	"
"	Maximum flow	0.044	0.000	0.044	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.044 0.044 0.127 0.127"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.044 0.044 0.044 0.127"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.044 c.m/sec"				
"	Hydrograph volume 181.305 c.m"				
"	0.044 0.044 0.044 0.044"				
" 40	HYDROGRAPH Confluence 100"				
"	7 Confluence "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow 0.052 c.m/sec"				
"	Hydrograph volume 127.863 c.m"				
"	0.044 0.052 0.044 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.044 0.052 0.052 0.000"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 0.145 c.m/sec"				
"	Hydrograph volume 2328.431 c.m"				
"	0.044 0.052 0.052 0.145"				
" 40	HYDROGRAPH Confluence 200"				
"	7 Confluence "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 0.145 c.m/sec"				
"	Hydrograph volume 2328.431 c.m"				
"	0.044 0.145 0.052 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.044 0.145 0.145 0.000"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.169 c.m/sec"				

"	Hydrograph volume	2509.736	c.m"
"	0.044 0.145 0.145	0.169"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	11.691	hectare"
"	Total % impervious	29.656"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Interim__2yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 11:39:23 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          414.876 Coefficient A"
"          0.027  Constant B"
"          0.682  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          100.235  mm/hr"
"          Total depth                39.504  mm"
"          6  002hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.022	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.816	0.326	1.648	minutes"
"		Time to Centroid	104.196	112.311	105.112	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	45.03	2.37	47.40	c.m"
"		Rainfall losses	25.568	5.814	24.580	mm"
"		Runoff depth	13.936	33.690	14.924	mm"
"		Runoff volume	15.89	2.02	17.91	c.m"
"		Runoff coefficient	0.353	0.853	0.378	"
"		Maximum flow	0.021	0.001	0.022	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.022	0.022	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.163	0.022	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	12.141	2.181	10.914	minutes"
"		Time to Centroid	117.971	114.662	117.563	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	649.25	34.17	683.42	c.m"
"		Rainfall losses	25.401	1.860	24.224	mm"
"		Runoff depth	14.103	37.644	15.280	mm"

"	Runoff volume	231.78	32.56	264.34	c.m"
"	Runoff coefficient	0.357	0.953	0.387	"
"	Maximum flow	0.158	0.022	0.163	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.163	0.167	0.000	0.000"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.163	0.167	0.167	0.000"	
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.167		c.m/sec"	
"	Hydrograph volume	282.246		c.m"	
"	0.163	0.167	0.167	0.167"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.163	0.000	0.167	0.167"	
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.449	0.000	0.167	0.167 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	53.548	9.620	52.390	minutes"
"	Time to Centroid	172.894	126.382	171.669	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"

"	Rainfall volume	5788.13	58.47	5846.59	c.m"
"	Rainfall losses	25.381	1.671	25.143	mm"
"	Runoff depth	14.123	37.833	14.361	mm"
"	Runoff volume	2069.36	55.99	2125.36	c.m"
"	Runoff coefficient	0.358	0.958	0.364	"
"	Maximum flow	0.445	0.030	0.449	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.449	0.449	0.167	0.167"
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	100 Catchment 100"				
"	80.000 % Impervious"				
"	13.090 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	2.618 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	10.472 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		2.700	0.449	0.167	0.167 c.m/sec"
"	Catchment 100	Pervious	Impervious	Total Area	"
"	Surface Area	2.618	10.472	13.090	hectare"
"	Time of concentration	14.661	2.634	3.668	minutes"
"	Time to Centroid	121.346	115.356	115.871	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	1034.22	4136.86	5171.08	c.m"
"	Rainfall losses	25.379	1.965	6.648	mm"
"	Runoff depth	14.125	37.539	32.856	mm"
"	Runoff volume	369.79	3931.05	4300.84	c.m"
"	Runoff coefficient	0.358	0.950	0.832	"
"	Maximum flow	0.236	2.644	2.700	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		2.700	2.753	0.167	0.167"
" 33	CATCHMENT 200"				

```

"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"         200   Catchment 200"
"        15.000 % Impervious"
"         2.020   Total Area"
"        40.000   Flow length"
"         2.000   Overland Slope"
"         1.717   Pervious Area"
"        40.000   Pervious length"
"         2.000   Pervious slope"
"         0.303   Impervious Area"
"        40.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"       30.000   Pervious Max.infiltration"
"         5.000   Pervious Min.infiltration"
"         0.250   Pervious Lag constant (hours)"
"         5.000   Pervious Depression storage"
"         0.015   Impervious Manning 'n'"
"         0.000   Impervious Max.infiltration"
"         0.000   Impervious Min.infiltration"
"         0.001   Impervious Lag constant (hours)"
"         1.500   Impervious Depression storage"
"
"           0.170      2.753      0.167      0.167 c.m/sec"
"         Catchment 200      Pervious      Impervious Total Area "
"         Surface Area      1.717      0.303      2.020      hectare"
"         Time of concentration 14.661      2.634      10.821      minutes"
"         Time to Centroid 121.346      115.356      119.434      minutes"
"         Rainfall depth      39.504      39.504      39.504      mm"
"         Rainfall volume      678.28      119.70      797.98      c.m"
"         Rainfall losses      25.379      1.965      21.867      mm"
"         Runoff depth      14.125      37.539      17.637      mm"
"         Runoff volume      242.53      113.74      356.27      c.m"
"         Runoff coefficient      0.358      0.950      0.446      "
"         Maximum flow      0.155      0.077      0.170      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"         4      Add Runoff "
"
"           0.170      2.866      0.167      0.167"
" 54      POND DESIGN"
"         2.866      Current peak flow      c.m/sec"
"         3.341      Target outflow      c.m/sec"
"        6782.5      Hydrograph volume      c.m"
"         18.      Number of stages"
"       421.500      Minimum water level      metre"
"       423.200      Maximum water level      metre"
"       421.500      Starting water level      metre"
"         0      Keep Design Data: 1 = True; 0 = False"
"           Level Discharge      Volume"
"       421.500      0.000      0.000"

```

"	421.600	0.00700	1070.100"		
"	421.700	0.01300	2176.600"		
"	421.800	0.01900	3319.800"		
"	421.900	0.02300	4500.000"		
"	422.000	0.02600	5717.200"		
"	422.100	0.07100	6977.200"		
"	422.200	0.1940	8275.500"		
"	422.300	0.3520	9602.300"		
"	422.400	0.3950	10957.80"		
"	422.500	0.5140	12342.10"		
"	422.600	0.7980	13755.30"		
"	422.700	0.9580	15197.70"		
"	422.800	1.614	16669.40"		
"	422.900	2.846	18170.60"		
"	423.000	4.482	19701.40"		
"	423.100	6.460	21262.00"		
"	423.200	8.746	22852.50"		
"	Peak outflow	0.046	c.m/sec"		
"	Maximum level	422.045	metre"		
"	Maximum storage	6285.971	c.m"		
"	Centroidal lag	44.437	hours"		
"	0.170	2.866	0.046	0.167	c.m/sec"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.170	0.046	0.046	0.167"	
" 33	CATCHMENT 400"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	400 Catchment 400"				
"	0.000 % Impervious"				
"	3.330 Total Area"				
"	120.000 Flow length"				
"	3.000 Overland Slope"				
"	3.330 Pervious Area"				
"	120.000 Pervious length"				
"	3.000 Pervious slope"				
"	0.000 Impervious Area"				
"	120.000 Impervious length"				
"	3.000 Impervious slope"				
"	0.250 Pervious Manning 'n' "				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n' "				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

	0.193	0.046	0.046	0.167 c.m/sec"	
"	Catchment 400	Pervious	Impervious	Total Area	"
"	Surface Area	3.330	0.000	3.330	hectare"
"	Time of concentration	25.097	4.509	25.096	minutes"
"	Time to Centroid	135.157	118.349	135.157	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	1315.48	0.00	1315.48	c.m"
"	Rainfall losses	25.393	1.692	25.393	mm"
"	Runoff depth	14.111	37.813	14.111	mm"
"	Runoff volume	469.88	0.00	469.89	c.m"
"	Runoff coefficient	0.357	0.000	0.357	"
"	Maximum flow	0.193	0.000	0.193	c.m/sec"

" 40 HYDROGRAPH Add Runoff "

" 4 Add Runoff "

	0.193	0.211	0.046	0.167"
--	-------	-------	-------	--------

" 33 CATCHMENT 300"

"	1	Triangular SCS"
"	1	Equal length"
"	2	Horton equation"
"	300	Catchment 300"
"	50.000	% Impervious"
"	1.350	Total Area"
"	20.000	Flow length"
"	15.000	Overland Slope"
"	0.675	Pervious Area"
"	20.000	Pervious length"
"	15.000	Pervious slope"
"	0.675	Impervious Area"
"	20.000	Impervious length"
"	15.000	Impervious slope"
"	0.250	Pervious Manning 'n'"
"	30.000	Pervious Max.infiltration"
"	5.000	Pervious Min.infiltration"
"	0.250	Pervious Lag constant (hours)"
"	5.000	Pervious Depression storage"
"	0.015	Impervious Manning 'n'"
"	0.000	Impervious Max.infiltration"
"	0.000	Impervious Min.infiltration"
"	0.001	Impervious Lag constant (hours)"
"	1.500	Impervious Depression storage"

	0.228	0.211	0.046	0.167 c.m/sec"
--	-------	-------	-------	----------------

"	Catchment 300	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	5.285	0.949	2.157	minutes"
"	Time to Centroid	108.893	112.435	111.449	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	266.65	266.65	533.30	c.m"
"	Rainfall losses	25.407	2.971	14.189	mm"
"	Runoff depth	14.097	36.533	25.315	mm"
"	Runoff volume	95.16	246.59	341.75	c.m"

"	Runoff coefficient	0.357	0.925	0.641	"
"	Maximum flow	0.106	0.170	0.228	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.228	0.266	0.046	0.167"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.228	0.266	0.266	0.167"	
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	0.266		c.m/sec"	
"	Hydrograph volume	3828.538		c.m"	
"	0.228	0.266	0.266	0.266"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.228	0.000	0.266	0.266"	
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.152	0.000	0.266	0.266 c.m/sec"	
"	Catchment 700	Pervious	Impervious	Total Area	"
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	29.362	5.275	29.362	minutes"
"	Time to Centroid	140.817	119.556	140.816	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	1177.22	0.00	1177.22	c.m"

"	Rainfall losses	25.383	1.653	25.383	mm"
"	Runoff depth	14.121	37.851	14.121	mm"
"	Runoff volume	420.82	0.00	420.82	c.m"
"	Runoff coefficient	0.357	0.000	0.357	"
"	Maximum flow	0.152	0.000	0.152	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.152 0.152 0.266 0.266"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.152 0.152 0.152 0.266"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.152 c.m/sec"				
"	Hydrograph volume 420.819 c.m"				
"	0.152 0.152 0.152 0.152"				
" 40	HYDROGRAPH Confluence 100"				
"	7 Confluence "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow 0.167 c.m/sec"				
"	Hydrograph volume 282.246 c.m"				
"	0.152 0.167 0.152 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.152 0.167 0.167 0.000"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 0.429 c.m/sec"				
"	Hydrograph volume 4110.784 c.m"				
"	0.152 0.167 0.167 0.429"				
" 40	HYDROGRAPH Confluence 200"				
"	7 Confluence "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 0.429 c.m/sec"				
"	Hydrograph volume 4110.784 c.m"				
"	0.152 0.429 0.167 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.152 0.429 0.429 0.000"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.518 c.m/sec"				

"	Hydrograph volume	4531.603	c.m"
"	0.152 0.429 0.429	0.518"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	11.691	hectare"
"	Total % impervious	29.656"	
" 19	EXIT"		


```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Interim__5yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 11:42:37 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          544.711 Coefficient A"
"          0.021  Constant B"
"          0.686  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          130.581  mm/hr"
"          Total depth                50.743  mm"
"          6  005hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.035	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.618	0.293	1.500	minutes"
"		Time to Centroid	105.803	111.144	106.279	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	57.85	3.04	60.89	c.m"
"		Rainfall losses	27.440	7.450	26.440	mm"
"		Runoff depth	23.303	43.293	24.303	mm"
"		Runoff volume	26.57	2.60	29.16	c.m"
"		Runoff coefficient	0.459	0.853	0.479	"
"		Maximum flow	0.033	0.002	0.035	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.035	0.035	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.287	0.035	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	10.817	1.962	9.949	minutes"
"		Time to Centroid	118.405	113.377	117.912	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	833.96	43.89	877.85	c.m"
"		Rainfall losses	27.163	2.058	25.907	mm"
"		Runoff depth	23.580	48.685	24.835	mm"

"	Runoff volume	387.54	42.11	429.65	c.m"
"	Runoff coefficient	0.465	0.959	0.489	"
"	Maximum flow	0.272	0.029	0.287	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.287 0.305 0.000 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.287 0.305 0.305 0.000"				
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.305		c.m/sec"	
"	Hydrograph volume	458.817		c.m"	
"	0.287 0.305 0.305 0.305"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.287 0.000 0.305 0.305"				
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.818 0.000 0.305 0.305 c.m/sec"				
"	Catchment 500 Pervious Impervious Total Area "				
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	47.706	8.654	46.903	minutes"
"	Time to Centroid	168.372	124.102	167.462	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"

"	Rainfall volume	7434.86	75.10	7509.96	c.m"
"	Rainfall losses	27.127	1.696	26.873	mm"
"	Runoff depth	23.616	49.047	23.870	mm"
"	Runoff volume	3460.21	72.59	3532.80	c.m"
"	Runoff coefficient	0.465	0.967	0.470	"
"	Maximum flow	0.812	0.040	0.818	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.818	0.818	0.305	0.305"
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	100 Catchment 100"				
"	80.000 % Impervious"				
"	13.090 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	2.618 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	10.472 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		3.616	0.818	0.305	0.305 c.m/sec"
"	Catchment 100	Pervious	Impervious	Total Area	"
"	Surface Area	2.618	10.472	13.090	hectare"
"	Time of concentration	13.062	2.369	3.518	minutes"
"	Time to Centroid	121.452	114.097	114.887	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	1328.45	5313.80	6642.25	c.m"
"	Rainfall losses	27.259	1.941	7.004	mm"
"	Runoff depth	23.484	48.802	43.739	mm"
"	Runoff volume	614.82	5110.59	5725.39	c.m"
"	Runoff coefficient	0.463	0.962	0.862	"
"	Maximum flow	0.395	3.479	3.616	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		3.616	3.726	0.305	0.305"
" 33	CATCHMENT 200"				

```

"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"         200   Catchment 200"
"        15.000 % Impervious"
"         2.020   Total Area"
"        40.000   Flow length"
"         2.000   Overland Slope"
"         1.717   Pervious Area"
"        40.000   Pervious length"
"         2.000   Pervious slope"
"         0.303   Impervious Area"
"        40.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"       30.000   Pervious Max.infiltration"
"         5.000   Pervious Min.infiltration"
"         0.250   Pervious Lag constant (hours)"
"         5.000   Pervious Depression storage"
"         0.015   Impervious Manning 'n'"
"         0.000   Impervious Max.infiltration"
"         0.000   Impervious Min.infiltration"
"         0.001   Impervious Lag constant (hours)"
"         1.500   Impervious Depression storage"
"
"           0.279      3.726      0.305      0.305 c.m/sec"
"         Catchment 200      Pervious      Impervious Total Area "
"         Surface Area      1.717      0.303      2.020      hectare"
"         Time of concentration 13.062      2.369      10.193      minutes"
"         Time to Centroid 121.452      114.097      119.479      minutes"
"         Rainfall depth      50.743      50.743      50.743      mm"
"         Rainfall volume      871.26      153.75      1025.01      c.m"
"         Rainfall losses      27.259      1.941      23.461      mm"
"         Runoff depth      23.484      48.802      27.282      mm"
"         Runoff volume      403.22      147.87      551.10      c.m"
"         Runoff coefficient      0.463      0.962      0.538      "
"         Maximum flow      0.259      0.101      0.279      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"         4      Add Runoff "
"
"           0.279      3.916      0.305      0.305"
" 54      POND DESIGN"
"         3.916      Current peak flow      c.m/sec"
"         3.341      Target outflow      c.m/sec"
"        9809.3      Hydrograph volume      c.m"
"         18.      Number of stages"
"       421.500      Minimum water level      metre"
"       423.200      Maximum water level      metre"
"       421.500      Starting water level      metre"
"         0      Keep Design Data: 1 = True; 0 = False"
"           Level Discharge      Volume"
"       421.500      0.000      0.000"

```

"	421.600	0.00700	1070.100"		
"	421.700	0.01300	2176.600"		
"	421.800	0.01900	3319.800"		
"	421.900	0.02300	4500.000"		
"	422.000	0.02600	5717.200"		
"	422.100	0.07100	6977.200"		
"	422.200	0.1940	8275.500"		
"	422.300	0.3520	9602.300"		
"	422.400	0.3950	10957.80"		
"	422.500	0.5140	12342.10"		
"	422.600	0.7980	13755.30"		
"	422.700	0.9580	15197.70"		
"	422.800	1.614	16669.40"		
"	422.900	2.846	18170.60"		
"	423.000	4.482	19701.40"		
"	423.100	6.460	21262.00"		
"	423.200	8.746	22852.50"		
"	Peak outflow	0.197	c.m/sec"		
"	Maximum level	422.202	metre"		
"	Maximum storage	8304.400	c.m"		
"	Centroidal lag	35.961	hours"		
"	0.279	3.916	0.197	0.305	c.m/sec"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.279	0.197	0.197	0.305"	
" 33	CATCHMENT 400"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	400 Catchment 400"				
"	0.000 % Impervious"				
"	3.330 Total Area"				
"	120.000 Flow length"				
"	3.000 Overland Slope"				
"	3.330 Pervious Area"				
"	120.000 Pervious length"				
"	3.000 Pervious slope"				
"	0.000 Impervious Area"				
"	120.000 Impervious length"				
"	3.000 Impervious slope"				
"	0.250 Pervious Manning 'n' "				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n' "				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

"	0.356	0.197	0.197	0.305 c.m/sec"	
"	Catchment 400	Pervious	Impervious	Total Area	"
"	Surface Area	3.330	0.000	3.330	hectare"
"	Time of concentration	22.359	4.056	22.359	minutes"
"	Time to Centroid	134.036	116.866	134.036	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	1689.74	0.00	1689.74	c.m"
"	Rainfall losses	27.188	2.068	27.188	mm"
"	Runoff depth	23.555	48.675	23.555	mm"
"	Runoff volume	784.37	0.00	784.38	c.m"
"	Runoff coefficient	0.464	0.000	0.464	"
"	Maximum flow	0.356	0.000	0.356	c.m/sec"

" 40 HYDROGRAPH Add Runoff "

"	4	Add Runoff "			
"	0.356	0.379	0.197	0.305"	

" 33	CATCHMENT 300"	
"	1	Triangular SCS"
"	1	Equal length"
"	2	Horton equation"
"	300	Catchment 300"
"	50.000	% Impervious"
"	1.350	Total Area"
"	20.000	Flow length"
"	15.000	Overland Slope"
"	0.675	Pervious Area"
"	20.000	Pervious length"
"	15.000	Pervious slope"
"	0.675	Impervious Area"
"	20.000	Impervious length"
"	15.000	Impervious slope"
"	0.250	Pervious Manning 'n'"
"	30.000	Pervious Max.infiltration"
"	5.000	Pervious Min.infiltration"
"	0.250	Pervious Lag constant (hours)"
"	5.000	Pervious Depression storage"
"	0.015	Impervious Manning 'n'"
"	0.000	Impervious Max.infiltration"
"	0.000	Impervious Min.infiltration"
"	0.001	Impervious Lag constant (hours)"
"	1.500	Impervious Depression storage"

"	0.347	0.379	0.197	0.305 c.m/sec"	
"	Catchment 300	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	4.708	0.854	2.132	minutes"
"	Time to Centroid	110.182	111.691	111.191	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	342.51	342.51	685.03	c.m"
"	Rainfall losses	27.326	3.537	15.432	mm"
"	Runoff depth	23.417	47.206	35.311	mm"
"	Runoff volume	158.07	318.64	476.70	c.m"

"	Runoff coefficient	0.461	0.930	0.696	"
"	Maximum flow	0.157	0.219	0.347	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.347 0.442 0.197 0.305"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.347 0.442 0.442 0.305"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	0.442		c.m/sec"	
"	Hydrograph volume	6876.024		c.m"	
"	0.347 0.442 0.442 0.442"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.347 0.000 0.442 0.442"				
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.271 0.000 0.442 0.442 c.m/sec"				
"	Catchment 700 Pervious Impervious Total Area "				
"	Surface Area 2.980 0.000 2.980 hectare"				
"	Time of concentration 26.159 4.745 26.159 minutes"				
"	Time to Centroid 139.192 117.881 139.192 minutes"				
"	Rainfall depth 50.743 50.743 50.743 mm"				
"	Rainfall volume 1512.14 0.00 1512.14 c.m"				

"	Rainfall losses	27.134	1.694	27.134	mm"
"	Runoff depth	23.609	49.049	23.609	mm"
"	Runoff volume	703.54	0.00	703.54	c.m"
"	Runoff coefficient	0.465	0.000	0.465	"
"	Maximum flow	0.271	0.000	0.271	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.271 0.271 0.442 0.442"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.271 0.271 0.271 0.442"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.271 c.m/sec"				
"	Hydrograph volume 703.538 c.m"				
"	0.271 0.271 0.271 0.271"				
" 40	HYDROGRAPH Confluence 100"				
"	7 Confluence "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow 0.305 c.m/sec"				
"	Hydrograph volume 458.817 c.m"				
"	0.271 0.305 0.271 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.271 0.305 0.305 0.000"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 0.732 c.m/sec"				
"	Hydrograph volume 7334.836 c.m"				
"	0.271 0.305 0.305 0.732"				
" 40	HYDROGRAPH Confluence 200"				
"	7 Confluence "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 0.732 c.m/sec"				
"	Hydrograph volume 7334.837 c.m"				
"	0.271 0.732 0.305 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.271 0.732 0.732 0.000"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.892 c.m/sec"				

"	Hydrograph volume	8038.375	c.m"
"	0.271 0.732 0.732 0.892"		
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	11.691	hectare"
"	Total % impervious	29.656"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Interim_10yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 11:44:41 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          627.308 Coefficient A"
"          0.014  Constant B"
"          0.687  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          150.159  mm/hr"
"          Total depth                58.119  mm"
"          6  010hyd Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250 Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.043	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.525	0.278	1.424	minutes"
"		Time to Centroid	107.285	110.607	107.552	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	66.26	3.49	69.74	c.m"
"		Rainfall losses	28.307	8.539	27.318	mm"
"		Runoff depth	29.812	49.580	30.801	mm"
"		Runoff volume	33.99	2.97	36.96	c.m"
"		Runoff coefficient	0.513	0.853	0.530	"
"		Maximum flow	0.040	0.002	0.043	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.043	0.043	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.378	0.043	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	10.194	1.856	9.450	minutes"
"		Time to Centroid	119.342	112.794	118.757	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	955.19	50.27	1005.46	c.m"
"		Rainfall losses	28.125	2.227	26.830	mm"
"		Runoff depth	29.994	55.893	31.289	mm"

"	Runoff volume	492.95	48.35	541.29	c.m"
"	Runoff coefficient	0.516	0.962	0.538	"
"	Maximum flow	0.361	0.033	0.378	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.378	0.398	0.000	0.000"
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"		0.378	0.398	0.398	0.000"
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.398			c.m/sec"
"	Hydrograph volume	578.255			c.m"
"		0.378	0.398	0.398	0.398"
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"		0.378	0.000	0.398	0.398"
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		1.110	0.000	0.398	0.398 c.m/sec"
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	44.961	8.184	44.280	minutes"
"	Time to Centroid	167.190	123.105	166.374	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"

"	Rainfall volume	8515.61	86.02	8601.63	c.m"
"	Rainfall losses	27.876	1.659	27.613	mm"
"	Runoff depth	30.244	56.460	30.506	mm"
"	Runoff volume	4431.29	83.56	4514.85	c.m"
"	Runoff coefficient	0.520	0.971	0.525	"
"	Maximum flow	1.104	0.051	1.110	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		1.110	1.110	0.398	0.398"
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	100 Catchment 100"				
"	80.000 % Impervious"				
"	13.090 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	2.618 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	10.472 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		4.219	1.110	0.398	0.398 c.m/sec"
"	Catchment 100	Pervious	Impervious	Total Area	"
"	Surface Area	2.618	10.472	13.090	hectare"
"	Time of concentration	12.310	2.241	3.433	minutes"
"	Time to Centroid	122.260	113.547	114.579	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"
"	Rainfall volume	1521.56	6086.23	7607.79	c.m"
"	Rainfall losses	27.960	1.991	7.185	mm"
"	Runoff depth	30.159	56.128	50.934	mm"
"	Runoff volume	789.57	5877.73	6667.30	c.m"
"	Runoff coefficient	0.519	0.966	0.876	"
"	Maximum flow	0.493	4.013	4.219	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		4.219	4.380	0.398	0.398"
" 33	CATCHMENT 200"				

```

"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"         200   Catchment 200"
"        15.000 % Impervious"
"         2.020   Total Area"
"        40.000   Flow length"
"         2.000   Overland Slope"
"         1.717   Pervious Area"
"        40.000   Pervious length"
"         2.000   Pervious slope"
"         0.303   Impervious Area"
"        40.000   Impervious length"
"         2.000   Impervious slope"
"         0.250   Pervious Manning 'n'"
"       30.000   Pervious Max.infiltration"
"         5.000   Pervious Min.infiltration"
"         0.250   Pervious Lag constant (hours)"
"         5.000   Pervious Depression storage"
"         0.015   Impervious Manning 'n'"
"         0.000   Impervious Max.infiltration"
"         0.000   Impervious Min.infiltration"
"         0.001   Impervious Lag constant (hours)"
"         1.500   Impervious Depression storage"
"           0.383      4.380      0.398      0.398 c.m/sec"
"         Catchment 200      Pervious      Impervious Total Area "
"         Surface Area      1.717      0.303      2.020      hectare"
"         Time of concentration 12.310      2.241      9.821      minutes"
"         Time to Centroid 122.260      113.547      120.106      minutes"
"         Rainfall depth      58.119      58.119      58.119      mm"
"         Rainfall volume      997.91      176.10      1174.01      c.m"
"         Rainfall losses      27.960      1.991      24.064      mm"
"         Runoff depth      30.159      56.128      34.055      mm"
"         Runoff volume      517.84      170.07      687.90      c.m"
"         Runoff coefficient      0.519      0.966      0.586      "
"         Maximum flow      0.323      0.116      0.383      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"         4      Add Runoff "
"           0.383      4.631      0.398      0.398"
" 54      POND DESIGN"
"         4.631      Current peak flow      c.m/sec"
"         3.341      Target outflow      c.m/sec"
"       11870.1      Hydrograph volume      c.m"
"         18.      Number of stages"
"       421.500      Minimum water level      metre"
"       423.200      Maximum water level      metre"
"       421.500      Starting water level      metre"
"         0      Keep Design Data: 1 = True; 0 = False"
"           Level Discharge      Volume"
"       421.500      0.000      0.000"

```

"	421.600	0.00700	1070.100"		
"	421.700	0.01300	2176.600"		
"	421.800	0.01900	3319.800"		
"	421.900	0.02300	4500.000"		
"	422.000	0.02600	5717.200"		
"	422.100	0.07100	6977.200"		
"	422.200	0.1940	8275.500"		
"	422.300	0.3520	9602.300"		
"	422.400	0.3950	10957.80"		
"	422.500	0.5140	12342.10"		
"	422.600	0.7980	13755.30"		
"	422.700	0.9580	15197.70"		
"	422.800	1.614	16669.40"		
"	422.900	2.846	18170.60"		
"	423.000	4.482	19701.40"		
"	423.100	6.460	21262.00"		
"	423.200	8.746	22852.50"		
"	Peak outflow	0.323	c.m/sec"		
"	Maximum level	422.281	metre"		
"	Maximum storage	9354.942	c.m"		
"	Centroidal lag	31.136	hours"		
"	0.383	4.631	0.323	0.398	c.m/sec"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.383	0.323	0.323	0.398"	
" 33	CATCHMENT 400"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	400 Catchment 400"				
"	0.000 % Impervious"				
"	3.330 Total Area"				
"	120.000 Flow length"				
"	3.000 Overland Slope"				
"	3.330 Pervious Area"				
"	120.000 Pervious length"				
"	3.000 Pervious slope"				
"	0.000 Impervious Area"				
"	120.000 Impervious length"				
"	3.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

	0.455	0.323	0.323	0.398 c.m/sec"	
"	Catchment 400	Pervious	Impervious	Total Area	"
"	Surface Area	3.330	0.000	3.330	hectare"
"	Time of concentration	21.072	3.835	21.072	minutes"
"	Time to Centroid	134.304	116.233	134.304	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"
"	Rainfall volume	1935.36	0.00	1935.37	c.m"
"	Rainfall losses	27.871	2.469	27.871	mm"
"	Runoff depth	30.248	55.650	30.248	mm"
"	Runoff volume	1007.27	0.00	1007.27	c.m"
"	Runoff coefficient	0.520	0.000	0.520	"
"	Maximum flow	0.455	0.000	0.455	c.m/sec"

" 40 HYDROGRAPH Add Runoff "

" 4 Add Runoff "

	0.455	0.480	0.323	0.398"
--	-------	-------	-------	--------

" 33 CATCHMENT 300"

"	1	Triangular SCS"
"	1	Equal length"
"	2	Horton equation"
"	300	Catchment 300"
"	50.000	% Impervious"
"	1.350	Total Area"
"	20.000	Flow length"
"	15.000	Overland Slope"
"	0.675	Pervious Area"
"	20.000	Pervious length"
"	15.000	Pervious slope"
"	0.675	Impervious Area"
"	20.000	Impervious length"
"	15.000	Impervious slope"
"	0.250	Pervious Manning 'n'"
"	30.000	Pervious Max.infiltration"
"	5.000	Pervious Min.infiltration"
"	0.250	Pervious Lag constant (hours)"
"	5.000	Pervious Depression storage"
"	0.015	Impervious Manning 'n'"
"	0.000	Impervious Max.infiltration"
"	0.000	Impervious Min.infiltration"
"	0.001	Impervious Lag constant (hours)"
"	1.500	Impervious Depression storage"

	0.424	0.480	0.323	0.398 c.m/sec"
--	-------	-------	-------	----------------

"	Catchment 300	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	4.437	0.808	2.102	minutes"
"	Time to Centroid	111.465	111.382	111.412	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"
"	Rainfall volume	392.30	392.30	784.61	c.m"
"	Rainfall losses	28.095	3.951	16.023	mm"
"	Runoff depth	30.025	54.169	42.097	mm"
"	Runoff volume	202.67	365.64	568.30	c.m"

"	Runoff coefficient	0.517	0.932	0.724	"
"	Maximum flow	0.180	0.250	0.424	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.424 0.560 0.323 0.398"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.424 0.560 0.560 0.398"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	0.560		c.m/sec"	
"	Hydrograph volume	9168.893		c.m"	
"	0.424 0.560 0.560 0.560"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.424 0.000 0.560 0.560"				
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.386 0.000 0.560 0.560 c.m/sec"				
"	Catchment 700 Pervious Impervious Total Area "				
"	Surface Area 2.980 0.000 2.980 hectare"				
"	Time of concentration 24.654 4.487 24.654 minutes"				
"	Time to Centroid 139.257 117.159 139.257 minutes"				
"	Rainfall depth 58.119 58.119 58.119 mm"				
"	Rainfall volume 1731.95 0.00 1731.95 c.m"				

"	Rainfall losses	27.890	1.793	27.890	mm"
"	Runoff depth	30.229	56.326	30.229	mm"
"	Runoff volume	900.82	0.00	900.82	c.m"
"	Runoff coefficient	0.520	0.000	0.520	"
"	Maximum flow	0.386	0.000	0.386	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.386 0.386 0.560 0.560"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.386 0.386 0.386 0.560"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.386 c.m/sec"				
"	Hydrograph volume 900.821 c.m"				
"	0.386 0.386 0.386 0.386"				
" 40	HYDROGRAPH Confluence 100"				
"	7 Confluence "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow 0.398 c.m/sec"				
"	Hydrograph volume 578.255 c.m"				
"	0.386 0.398 0.386 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.386 0.398 0.398 0.000"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 0.944 c.m/sec"				
"	Hydrograph volume 9747.152 c.m"				
"	0.386 0.398 0.398 0.944"				
" 40	HYDROGRAPH Confluence 200"				
"	7 Confluence "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 0.944 c.m/sec"				
"	Hydrograph volume 9747.152 c.m"				
"	0.386 0.944 0.398 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.386 0.944 0.944 0.000"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 1.160 c.m/sec"				

"	Hydrograph volume	10647.971	c.m"
"	0.386 0.944 0.944	1.160"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	11.691	hectare"
"	Total % impervious	29.656"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Interim__25yr.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/5/2025 at 11:46:32 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          746.059  Coefficient A"
"          0.085  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          175.653  mm/hr"
"          Total depth          67.239  mm"
"          6  025hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000  Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000  Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.052	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.428	0.261	1.342	minutes"
"		Time to Centroid	108.971	109.975	109.045	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	76.65	4.03	80.69	c.m"
"		Rainfall losses	29.074	9.934	28.117	mm"
"		Runoff depth	38.165	57.305	39.122	mm"
"		Runoff volume	43.51	3.44	46.95	c.m"
"		Runoff coefficient	0.568	0.852	0.582	"
"		Maximum flow	0.049	0.003	0.052	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.052	0.052	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.496	0.052	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	9.548	1.743	8.915	minutes"
"		Time to Centroid	120.388	112.106	119.717	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	1105.07	58.16	1163.23	c.m"
"		Rainfall losses	28.570	2.417	27.262	mm"
"		Runoff depth	38.669	64.822	39.977	mm"

"	Runoff volume	635.52	56.07	691.59	c.m"
"	Runoff coefficient	0.575	0.964	0.595	"
"	Maximum flow	0.477	0.039	0.496	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.496	0.519	0.000	0.000"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.496	0.519	0.519	0.000"	
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.519		c.m/sec"	
"	Hydrograph volume	738.540		c.m"	
"	0.496	0.519	0.519	0.519"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.496	0.000	0.519	0.519"	
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	1.530	0.000	0.519	0.519 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	42.108	7.686	41.532	minutes"
"	Time to Centroid	165.819	121.852	165.083	minutes"
"	Rainfall depth	67.239	67.239	67.239	mm"

"	Rainfall volume	9851.84	99.51	9951.36	c.m"
"	Rainfall losses	28.384	1.687	28.117	mm"
"	Runoff depth	38.855	65.552	39.122	mm"
"	Runoff volume	5692.97	97.02	5789.99	c.m"
"	Runoff coefficient	0.578	0.975	0.582	"
"	Maximum flow	1.521	0.060	1.530	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		1.530	1.530	0.519	0.519"
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	100 Catchment 100"				
"	80.000 % Impervious"				
"	13.090 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	2.618 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	10.472 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		5.040	1.530	0.519	0.519 c.m/sec"
"	Catchment 100	Pervious	Impervious	Total Area	"
"	Surface Area	2.618	10.472	13.090	hectare"
"	Time of concentration	11.529	2.104	3.327	minutes"
"	Time to Centroid	123.146	112.845	114.181	minutes"
"	Rainfall depth	67.239	67.239	67.239	mm"
"	Rainfall volume	1760.31	7041.26	8801.57	c.m"
"	Rainfall losses	28.447	2.145	7.405	mm"
"	Runoff depth	38.792	65.094	59.834	mm"
"	Runoff volume	1015.58	6816.62	7832.21	c.m"
"	Runoff coefficient	0.577	0.968	0.890	"
"	Maximum flow	0.662	4.705	5.040	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		5.040	5.289	0.519	0.519"
" 33	CATCHMENT 200"				


```

"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"      200   Catchment 200"
"    15.000   % Impervious"
"      2.020   Total Area"
"    40.000   Flow length"
"      2.000   Overland Slope"
"      1.717   Pervious Area"
"    40.000   Pervious length"
"      2.000   Pervious slope"
"      0.303   Impervious Area"
"    40.000   Impervious length"
"      2.000   Impervious slope"
"      0.250   Pervious Manning 'n'"
"    30.000   Pervious Max.infiltration"
"      5.000   Pervious Min.infiltration"
"      0.250   Pervious Lag constant (hours)"
"      5.000   Pervious Depression storage"
"      0.015   Impervious Manning 'n'"
"      0.000   Impervious Max.infiltration"
"      0.000   Impervious Min.infiltration"
"      0.001   Impervious Lag constant (hours)"
"      1.500   Impervious Depression storage"
"
"          0.509      5.289      0.519      0.519 c.m/sec"
"      Catchment 200      Pervious      Impervious Total Area "
"      Surface Area      1.717      0.303      2.020      hectare"
"      Time of concentration 11.529      2.104      9.376      minutes"
"      Time to Centroid 123.146      112.845      120.792      minutes"
"      Rainfall depth      67.239      67.239      67.239      mm"
"      Rainfall volume      1154.49      203.73      1358.23      c.m"
"      Rainfall losses      28.447      2.145      24.501      mm"
"      Runoff depth      38.792      65.094      42.738      mm"
"      Runoff volume      666.06      197.23      863.30      c.m"
"      Runoff coefficient      0.577      0.968      0.636      "
"      Maximum flow      0.434      0.136      0.509      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"
"          0.509      5.646      0.519      0.519"
" 54      POND DESIGN"
"      5.646      Current peak flow      c.m/sec"
"      3.341      Target outflow      c.m/sec"
"    14485.5      Hydrograph volume      c.m"
"      18.      Number of stages"
"    421.500      Minimum water level      metre"
"    423.200      Maximum water level      metre"
"    421.500      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"    421.500      0.000      0.000"

```

"	421.600	0.00700	1070.100"		
"	421.700	0.01300	2176.600"		
"	421.800	0.01900	3319.800"		
"	421.900	0.02300	4500.000"		
"	422.000	0.02600	5717.200"		
"	422.100	0.07100	6977.200"		
"	422.200	0.1940	8275.500"		
"	422.300	0.3520	9602.300"		
"	422.400	0.3950	10957.80"		
"	422.500	0.5140	12342.10"		
"	422.600	0.7980	13755.30"		
"	422.700	0.9580	15197.70"		
"	422.800	1.614	16669.40"		
"	422.900	2.846	18170.60"		
"	423.000	4.482	19701.40"		
"	423.100	6.460	21262.00"		
"	423.200	8.746	22852.50"		
"	Peak outflow	0.398	c.m/sec"		
"	Maximum level	422.402	metre"		
"	Maximum storage	10987.398	c.m"		
"	Centroidal lag	27.034	hours"		
"	0.509	5.646	0.398	0.519	c.m/sec"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.509	0.398	0.398	0.519"	
" 33	CATCHMENT 400"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	400 Catchment 400"				
"	0.000 % Impervious"				
"	3.330 Total Area"				
"	120.000 Flow length"				
"	3.000 Overland Slope"				
"	3.330 Pervious Area"				
"	120.000 Pervious length"				
"	3.000 Pervious slope"				
"	0.000 Impervious Area"				
"	120.000 Impervious length"				
"	3.000 Impervious slope"				
"	0.250 Pervious Manning 'n' "				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n' "				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

"	0.607	0.398	0.398	0.519 c.m/sec"
"	Catchment 400	Pervious	Impervious	Total Area "
"	Surface Area	3.330	0.000	3.330 hectare"
"	Time of concentration	19.735	3.602	19.735 minutes"
"	Time to Centroid	134.608	115.439	134.608 minutes"
"	Rainfall depth	67.239	67.239	67.239 mm"
"	Rainfall volume	2239.05	0.00	2239.05 c.m"
"	Rainfall losses	28.441	2.959	28.441 mm"
"	Runoff depth	38.798	64.280	38.798 mm"
"	Runoff volume	1291.96	0.00	1291.97 c.m"
"	Runoff coefficient	0.577	0.000	0.577 "
"	Maximum flow	0.607	0.000	0.607 c.m/sec"

" 40 HYDROGRAPH Add Runoff "

" 4 Add Runoff "

"	0.607	0.632	0.398	0.519"
---	-------	-------	-------	--------

" 33 CATCHMENT 300"

"	1	Triangular SCS"
"	1	Equal length"
"	2	Horton equation"
"	300	Catchment 300"
"	50.000	% Impervious"
"	1.350	Total Area"
"	20.000	Flow length"
"	15.000	Overland Slope"
"	0.675	Pervious Area"
"	20.000	Pervious length"
"	15.000	Pervious slope"
"	0.675	Impervious Area"
"	20.000	Impervious length"
"	15.000	Impervious slope"
"	0.250	Pervious Manning 'n' "
"	30.000	Pervious Max.infiltration"
"	5.000	Pervious Min.infiltration"
"	0.250	Pervious Lag constant (hours)"
"	5.000	Pervious Depression storage"
"	0.015	Impervious Manning 'n' "
"	0.000	Impervious Max.infiltration"
"	0.000	Impervious Min.infiltration"
"	0.001	Impervious Lag constant (hours)"
"	1.500	Impervious Depression storage"

"	0.525	0.632	0.398	0.519 c.m/sec"
---	-------	-------	-------	----------------

"	Catchment 300	Pervious	Impervious	Total Area "
"	Surface Area	0.675	0.675	1.350 hectare"
"	Time of concentration	4.156	0.759	2.050 minutes"
"	Time to Centroid	112.936	110.977	111.722 minutes"
"	Rainfall depth	67.239	67.239	67.239 mm"
"	Rainfall volume	453.86	453.86	907.72 c.m"
"	Rainfall losses	28.833	4.588	16.711 mm"
"	Runoff depth	38.406	62.651	50.528 mm"
"	Runoff volume	259.24	422.89	682.13 c.m"

"	Runoff coefficient	0.571	0.932	0.751	"
"	Maximum flow	0.234	0.291	0.525	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.525 0.756 0.398 0.519"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.525 0.756 0.756 0.519"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	0.756		c.m/sec"	
"	Hydrograph volume	12088.804		c.m"	
"	0.525 0.756 0.756 0.756"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.525 0.000 0.756 0.756"				
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.500 0.000 0.756 0.756 c.m/sec"				
"	Catchment 700 Pervious Impervious Total Area "				
"	Surface Area 2.980 0.000 2.980 hectare"				
"	Time of concentration 23.089 4.215 23.089 minutes"				
"	Time to Centroid 139.283 116.269 139.283 minutes"				
"	Rainfall depth 67.239 67.239 67.239 mm"				
"	Rainfall volume 2003.72 0.00 2003.72 c.m"				

"	Rainfall losses	28.407	2.068	28.407	mm"
"	Runoff depth	38.832	65.171	38.832	mm"
"	Runoff volume	1157.20	0.00	1157.20	c.m"
"	Runoff coefficient	0.578	0.000	0.578	"
"	Maximum flow	0.500	0.000	0.500	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.500 0.500 0.756 0.756"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.500 0.500 0.500 0.756"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.500 c.m/sec"				
"	Hydrograph volume 1157.205 c.m"				
"	0.500 0.500 0.500 0.500"				
" 40	HYDROGRAPH Confluence 100"				
"	7 Confluence "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow 0.519 c.m/sec"				
"	Hydrograph volume 738.540 c.m"				
"	0.500 0.519 0.500 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.500 0.519 0.519 0.000"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 1.239 c.m/sec"				
"	Hydrograph volume 12827.345 c.m"				
"	0.500 0.519 0.519 1.239"				
" 40	HYDROGRAPH Confluence 200"				
"	7 Confluence "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 1.239 c.m/sec"				
"	Hydrograph volume 12827.345 c.m"				
"	0.500 1.239 0.519 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.500 1.239 1.239 0.000"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 1.575 c.m/sec"				

"	Hydrograph volume	13984.553	c.m"
"	0.500 1.239 1.239	1.575"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	11.691	hectare"
"	Total % impervious	29.656"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Interim_50yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 11:49:00 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          820.361 Coefficient A"
"          0.010  Constant B"
"          0.691  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          194.803  mm/hr"
"          Total depth                74.358  mm"
"          6  050hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.058	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.368	0.250	1.290	minutes"
"		Time to Centroid	110.205	109.690	110.169	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	84.77	4.46	89.23	c.m"
"		Rainfall losses	29.637	11.032	28.707	mm"
"		Runoff depth	44.721	63.326	45.651	mm"
"		Runoff volume	50.98	3.80	54.78	c.m"
"		Runoff coefficient	0.601	0.852	0.614	"
"		Maximum flow	0.055	0.003	0.058	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.058	0.058	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.580	0.058	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	9.147	1.672	8.573	minutes"
"		Time to Centroid	121.402	111.843	120.668	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	1222.07	64.32	1286.39	c.m"
"		Rainfall losses	28.890	2.541	27.572	mm"
"		Runoff depth	45.468	71.816	46.785	mm"

"	Runoff volume	747.27	62.12	809.39	c.m"
"	Runoff coefficient	0.611	0.966	0.629	"
"	Maximum flow	0.558	0.043	0.580	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.580 0.604 0.000 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.580 0.604 0.604 0.000"				
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.604			c.m/sec"
"	Hydrograph volume	864.169			c.m"
"	0.580 0.604 0.604 0.604"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.580 0.000 0.604 0.604"				
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	1.817 0.000 0.604 0.604 c.m/sec"				
"	Catchment 500 Pervious Impervious Total Area "				
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	40.339	7.374	39.818	minutes"
"	Time to Centroid	166.075	121.211	165.366	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"

"	Rainfall volume	1.0895	0.0110	1.1005	ha-m"
"	Rainfall losses	28.716	1.802	28.447	mm"
"	Runoff depth	45.642	72.556	45.911	mm"
"	Runoff volume	6687.42	107.38	6794.80	c.m"
"	Runoff coefficient	0.614	0.976	0.617	"
"	Maximum flow	1.807	0.066	1.817	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		1.817	1.817	0.604	0.604"
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	100 Catchment 100"				
"	80.000 % Impervious"				
"	13.090 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	2.618 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	10.472 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		5.638	1.817	0.604	0.604 c.m/sec"
"	Catchment 100	Pervious	Impervious	Total Area	"
"	Surface Area	2.618	10.472	13.090	hectare"
"	Time of concentration	11.045	2.019	3.250	minutes"
"	Time to Centroid	124.131	112.509	114.093	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"
"	Rainfall volume	1946.69	7786.75	9733.44	c.m"
"	Rainfall losses	28.840	2.269	7.583	mm"
"	Runoff depth	45.518	72.088	66.774	mm"
"	Runoff volume	1191.65	7549.11	8740.76	c.m"
"	Runoff coefficient	0.612	0.969	0.898	"
"	Maximum flow	0.783	5.218	5.638	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		5.638	5.949	0.604	0.604"
" 33	CATCHMENT 200"				

```

"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"      200   Catchment 200"
"    15.000   % Impervious"
"      2.020   Total Area"
"    40.000   Flow length"
"      2.000   Overland Slope"
"      1.717   Pervious Area"
"    40.000   Pervious length"
"      2.000   Pervious slope"
"      0.303   Impervious Area"
"    40.000   Impervious length"
"      2.000   Impervious slope"
"      0.250   Pervious Manning 'n'"
"    30.000   Pervious Max.infiltration"
"      5.000   Pervious Min.infiltration"
"      0.250   Pervious Lag constant (hours)"
"      5.000   Pervious Depression storage"
"      0.015   Impervious Manning 'n'"
"      0.000   Impervious Max.infiltration"
"      0.000   Impervious Min.infiltration"
"      0.001   Impervious Lag constant (hours)"
"      1.500   Impervious Depression storage"
"
"          0.595      5.949      0.604      0.604 c.m/sec"
"      Catchment 200      Pervious      Impervious Total Area "
"      Surface Area      1.717      0.303      2.020      hectare"
"      Time of concentration 11.045      2.019      9.073      minutes"
"      Time to Centroid 124.131      112.509      121.592      minutes"
"      Rainfall depth      74.358      74.358      74.358      mm"
"      Rainfall volume      1276.72      225.30      1502.03      c.m"
"      Rainfall losses      28.840      2.269      24.855      mm"
"      Runoff depth      45.518      72.088      49.503      mm"
"      Runoff volume      781.54      218.43      999.97      c.m"
"      Runoff coefficient      0.612      0.969      0.666      "
"      Maximum flow      0.514      0.151      0.595      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"
"          0.595      6.376      0.604      0.604"
" 54      POND DESIGN"
"      6.376      Current peak flow      c.m/sec"
"      3.341      Target outflow      c.m/sec"
"    16535.5      Hydrograph volume      c.m"
"      18.      Number of stages"
"    421.500      Minimum water level      metre"
"    423.200      Maximum water level      metre"
"    421.500      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"    421.500      0.000      0.000"

```

"	421.600	0.00700	1070.100"		
"	421.700	0.01300	2176.600"		
"	421.800	0.01900	3319.800"		
"	421.900	0.02300	4500.000"		
"	422.000	0.02600	5717.200"		
"	422.100	0.07100	6977.200"		
"	422.200	0.1940	8275.500"		
"	422.300	0.3520	9602.300"		
"	422.400	0.3950	10957.80"		
"	422.500	0.5140	12342.10"		
"	422.600	0.7980	13755.30"		
"	422.700	0.9580	15197.70"		
"	422.800	1.614	16669.40"		
"	422.900	2.846	18170.60"		
"	423.000	4.482	19701.40"		
"	423.100	6.460	21262.00"		
"	423.200	8.746	22852.50"		
"	Peak outflow	0.501	c.m/sec"		
"	Maximum level	422.489	metre"		
"	Maximum storage	12187.462	c.m"		
"	Centroidal lag	24.653	hours"		
"	0.595	6.376	0.501	0.604	c.m/sec"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.595	0.501	0.501	0.604"	
" 33	CATCHMENT 400"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	400 Catchment 400"				
"	0.000 % Impervious"				
"	3.330 Total Area"				
"	120.000 Flow length"				
"	3.000 Overland Slope"				
"	3.330 Pervious Area"				
"	120.000 Pervious length"				
"	3.000 Pervious slope"				
"	0.000 Impervious Area"				
"	120.000 Impervious length"				
"	3.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

	0.720	0.501	0.501	0.604 c.m/sec"	
"	Catchment 400	Pervious	Impervious	Total Area	"
"	Surface Area	3.330	0.000	3.330	hectare"
"	Time of concentration	18.906	3.456	18.906	minutes"
"	Time to Centroid	135.377	115.016	135.377	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"
"	Rainfall volume	2476.11	0.00	2476.11	c.m"
"	Rainfall losses	28.813	3.112	28.813	mm"
"	Runoff depth	45.544	71.246	45.544	mm"
"	Runoff volume	1516.63	0.00	1516.63	c.m"
"	Runoff coefficient	0.613	0.000	0.613	"
"	Maximum flow	0.720	0.000	0.720	c.m/sec"

" 40 HYDROGRAPH Add Runoff "

"	4	Add Runoff "			
"		0.720	0.762	0.501	0.604"

" 33	CATCHMENT 300"			
"	1	Triangular SCS"		
"	1	Equal length"		
"	2	Horton equation"		
"	300	Catchment 300"		
"	50.000	% Impervious"		
"	1.350	Total Area"		
"	20.000	Flow length"		
"	15.000	Overland Slope"		
"	0.675	Pervious Area"		
"	20.000	Pervious length"		
"	15.000	Pervious slope"		
"	0.675	Impervious Area"		
"	20.000	Impervious length"		
"	15.000	Impervious slope"		
"	0.250	Pervious Manning 'n'"		
"	30.000	Pervious Max.infiltration"		
"	5.000	Pervious Min.infiltration"		
"	0.250	Pervious Lag constant (hours)"		
"	5.000	Pervious Depression storage"		
"	0.015	Impervious Manning 'n'"		
"	0.000	Impervious Max.infiltration"		
"	0.000	Impervious Min.infiltration"		
"	0.001	Impervious Lag constant (hours)"		
"	1.500	Impervious Depression storage"		

	0.597	0.762	0.501	0.604 c.m/sec"	
"	Catchment 300	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	3.981	0.728	2.007	minutes"
"	Time to Centroid	114.123	110.827	112.123	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"
"	Rainfall volume	501.92	501.92	1003.83	c.m"
"	Rainfall losses	29.474	5.085	17.279	mm"
"	Runoff depth	44.884	69.273	57.079	mm"
"	Runoff volume	302.97	467.59	770.56	c.m"

"	Runoff coefficient	0.604	0.932	0.768	"
"	Maximum flow	0.276	0.321	0.597	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.597 0.893 0.501 0.604"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.597 0.893 0.893 0.604"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	0.893		c.m/sec"	
"	Hydrograph volume	14396.146		c.m"	
"	0.597 0.893 0.893 0.893"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.597 0.000 0.893 0.893"				
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.575 0.000 0.893 0.893 c.m/sec"				
"	Catchment 700 Pervious Impervious Total Area "				
"	Surface Area 2.980 0.000 2.980 hectare"				
"	Time of concentration 22.119 4.044 22.119 minutes"				
"	Time to Centroid 139.988 115.872 139.988 minutes"				
"	Rainfall depth 74.358 74.358 74.358 mm"				
"	Rainfall volume 2215.86 0.00 2215.86 c.m"				

"	Rainfall losses	28.813	2.354	28.812	mm"
"	Runoff depth	45.545	72.004	45.545	mm"
"	Runoff volume	1357.25	0.00	1357.25	c.m"
"	Runoff coefficient	0.613	0.000	0.613	"
"	Maximum flow	0.575	0.000	0.575	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.575 0.575 0.893 0.893"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.575 0.575 0.575 0.893"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 0.575 c.m/sec"				
"	Hydrograph volume 1357.251 c.m"				
"	0.575 0.575 0.575 0.575"				
" 40	HYDROGRAPH Confluence 100"				
"	7 Confluence "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow 0.604 c.m/sec"				
"	Hydrograph volume 864.169 c.m"				
"	0.575 0.604 0.575 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.575 0.604 0.604 0.000"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 1.453 c.m/sec"				
"	Hydrograph volume 15260.317 c.m"				
"	0.575 0.604 0.604 1.453"				
" 40	HYDROGRAPH Confluence 200"				
"	7 Confluence "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 1.453 c.m/sec"				
"	Hydrograph volume 15260.318 c.m"				
"	0.575 1.453 0.604 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.575 1.453 1.453 0.000"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow 1.860 c.m/sec"				

"	Hydrograph volume	16617.568	c.m"
"	0.575 1.453 1.453	1.860"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	11.691	hectare"
"	Total % impervious	29.656"	
" 19	EXIT"		


```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Interim_100yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 11:52:52 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          901.088 Coefficient A"
"          0.043  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          212.928  mm/hr"
"          Total depth                81.221  mm"
"          6  100hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          600  Catchment 600"
"          5.000  % Impervious"
"          0.120  Total Area"
"          5.000  Flow length"
"          33.000 Overland Slope"
"          0.114  Pervious Area"
"          5.000  Pervious length"
"          33.000 Pervious slope"
"          0.006  Impervious Area"
"          5.000  Impervious length"
"          33.000 Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.063	0.000	0.000	0.000 c.m/sec"	
"		Catchment 600	Pervious	Impervious	Total Area	"
"		Surface Area	0.114	0.006	0.120	hectare"
"		Time of concentration	1.319	0.241	1.247	minutes"
"		Time to Centroid	110.907	109.390	110.806	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	92.59	4.87	97.47	c.m"
"		Rainfall losses	30.156	12.072	29.251	mm"
"		Runoff depth	51.065	69.149	51.969	mm"
"		Runoff volume	58.21	4.15	62.36	c.m"
"		Runoff coefficient	0.629	0.851	0.640	"
"		Maximum flow	0.060	0.003	0.063	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.063	0.063	0.000	0.000"	
" 33		CATCHMENT 800"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	800	Catchment 800"				
"	5.000	% Impervious"				
"	1.730	Total Area"				
"	40.000	Flow length"				
"	3.750	Overland Slope"				
"	1.643	Pervious Area"				
"	40.000	Pervious length"				
"	3.750	Pervious slope"				
"	0.087	Impervious Area"				
"	40.000	Impervious length"				
"	3.750	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.664	0.063	0.000	0.000 c.m/sec"	
"		Catchment 800	Pervious	Impervious	Total Area	"
"		Surface Area	1.643	0.087	1.730	hectare"
"		Time of concentration	8.817	1.614	8.287	minutes"
"		Time to Centroid	121.743	111.617	120.997	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	1334.87	70.26	1405.12	c.m"
"		Rainfall losses	29.209	2.686	27.883	mm"
"		Runoff depth	52.011	78.534	53.338	mm"

"	Runoff volume	854.81	67.93	922.74	c.m"
"	Runoff coefficient	0.640	0.967	0.657	"
"	Maximum flow	0.641	0.047	0.664	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.664 0.691 0.000 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.664 0.691 0.691 0.000"				
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.691		c.m/sec"	
"	Hydrograph volume	985.103		c.m"	
"	0.664 0.691 0.691 0.691"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.664 0.000 0.691 0.691"				
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	2.059 0.000 0.691 0.691 c.m/sec"				
"	Catchment 500 Pervious Impervious Total Area "				
"	Surface Area 14.652 0.148 14.800 hectare"				
"	Time of concentration 38.886 7.117 38.406 minutes"				
"	Time to Centroid 164.999 120.685 164.330 minutes"				
"	Rainfall depth 81.221 81.221 81.221 mm"				

"	Rainfall volume	1.1900	0.0120	1.2021	ha-m"
"	Rainfall losses	28.976	1.949	28.706	mm"
"	Runoff depth	52.245	79.272	52.515	mm"
"	Runoff volume	7654.92	117.32	7772.24	c.m"
"	Runoff coefficient	0.643	0.976	0.647	"
"	Maximum flow	2.049	0.072	2.059	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		2.059	2.059	0.691	0.691"
" 33	CATCHMENT 100"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	100 Catchment 100"				
"	80.000 % Impervious"				
"	13.090 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	2.618 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	10.472 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		6.209	2.059	0.691	0.691 c.m/sec"
"	Catchment 100	Pervious	Impervious	Total Area	"
"	Surface Area	2.618	10.472	13.090	hectare"
"	Time of concentration	10.647	1.949	3.182	minutes"
"	Time to Centroid	124.364	112.180	113.907	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"
"	Rainfall volume	0.2126	0.8505	1.0632	ha-m"
"	Rainfall losses	29.139	2.392	7.742	mm"
"	Runoff depth	52.082	78.828	73.479	mm"
"	Runoff volume	1363.51	8254.91	9618.42	c.m"
"	Runoff coefficient	0.641	0.971	0.905	"
"	Maximum flow	0.913	5.702	6.209	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		6.209	6.587	0.691	0.691"
" 33	CATCHMENT 200"				

```

"          1   Triangular SCS"
"          1   Equal length"
"          2   Horton equation"
"      200   Catchment 200"
"    15.000   % Impervious"
"      2.020   Total Area"
"    40.000   Flow length"
"      2.000   Overland Slope"
"      1.717   Pervious Area"
"    40.000   Pervious length"
"      2.000   Pervious slope"
"      0.303   Impervious Area"
"    40.000   Impervious length"
"      2.000   Impervious slope"
"      0.250   Pervious Manning 'n'"
"    30.000   Pervious Max.infiltration"
"      5.000   Pervious Min.infiltration"
"      0.250   Pervious Lag constant (hours)"
"      5.000   Pervious Depression storage"
"      0.015   Impervious Manning 'n'"
"      0.000   Impervious Max.infiltration"
"      0.000   Impervious Min.infiltration"
"      0.001   Impervious Lag constant (hours)"
"      1.500   Impervious Depression storage"
"
"          0.686      6.587      0.691      0.691 c.m/sec"
"      Catchment 200      Pervious      Impervious Total Area "
"      Surface Area      1.717      0.303      2.020      hectare"
"      Time of concentration 10.647      1.949      8.813      minutes"
"      Time to Centroid 124.365      112.180      121.796      minutes"
"      Rainfall depth      81.221      81.221      81.221      mm"
"      Rainfall volume      1394.56      246.10      1640.66      c.m"
"      Rainfall losses      29.139      2.392      25.127      mm"
"      Runoff depth      52.082      78.828      56.094      mm"
"      Runoff volume      894.25      238.85      1133.10      c.m"
"      Runoff coefficient      0.641      0.971      0.691      "
"      Maximum flow      0.598      0.165      0.686      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"      4      Add Runoff "
"
"          0.686      7.084      0.691      0.691"
" 54      POND DESIGN"
"      7.084      Current peak flow      c.m/sec"
"      3.341      Target outflow      c.m/sec"
"    18523.8      Hydrograph volume      c.m"
"      18.      Number of stages"
"    421.500      Minimum water level      metre"
"    423.200      Maximum water level      metre"
"    421.500      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"    421.500      0.000      0.000"

```

"	421.600	0.00700	1070.100"		
"	421.700	0.01300	2176.600"		
"	421.800	0.01900	3319.800"		
"	421.900	0.02300	4500.000"		
"	422.000	0.02600	5717.200"		
"	422.100	0.07100	6977.200"		
"	422.200	0.1940	8275.500"		
"	422.300	0.3520	9602.300"		
"	422.400	0.3950	10957.80"		
"	422.500	0.5140	12342.10"		
"	422.600	0.7980	13755.30"		
"	422.700	0.9580	15197.70"		
"	422.800	1.614	16669.40"		
"	422.900	2.846	18170.60"		
"	423.000	4.482	19701.40"		
"	423.100	6.460	21262.00"		
"	423.200	8.746	22852.50"		
"	Peak outflow	0.681	c.m/sec"		
"	Maximum level	422.559	metre"		
"	Maximum storage	13175.188	c.m"		
"	Centroidal lag	22.647	hours"		
"	0.686	7.084	0.681	0.691	c.m/sec"
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.686	0.681	0.681	0.691"	
" 33	CATCHMENT 400"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	400 Catchment 400"				
"	0.000 % Impervious"				
"	3.330 Total Area"				
"	120.000 Flow length"				
"	3.000 Overland Slope"				
"	3.330 Pervious Area"				
"	120.000 Pervious length"				
"	3.000 Pervious slope"				
"	0.000 Impervious Area"				
"	120.000 Impervious length"				
"	3.000 Impervious slope"				
"	0.250 Pervious Manning 'n' "				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n' "				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

"	0.835	0.681	0.681	0.691 c.m/sec"	
"	Catchment 400	Pervious	Impervious	Total Area	"
"	Surface Area	3.330	0.000	3.330	hectare"
"	Time of concentration	18.225	3.335	18.225	minutes"
"	Time to Centroid	135.263	114.631	135.263	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"
"	Rainfall volume	2704.65	0.00	2704.66	c.m"
"	Rainfall losses	28.982	3.311	28.982	mm"
"	Runoff depth	52.239	77.910	52.239	mm"
"	Runoff volume	1739.55	0.00	1739.55	c.m"
"	Runoff coefficient	0.643	0.000	0.643	"
"	Maximum flow	0.835	0.000	0.835	c.m/sec"

" 40 HYDROGRAPH Add Runoff "

" 4 Add Runoff "

"	0.835	0.909	0.681	0.691"
---	-------	-------	-------	--------

" 33 CATCHMENT 300"

"	1	Triangular SCS"
"	1	Equal length"
"	2	Horton equation"
"	300	Catchment 300"
"	50.000	% Impervious"
"	1.350	Total Area"
"	20.000	Flow length"
"	15.000	Overland Slope"
"	0.675	Pervious Area"
"	20.000	Pervious length"
"	15.000	Pervious slope"
"	0.675	Impervious Area"
"	20.000	Impervious length"
"	15.000	Impervious slope"
"	0.250	Pervious Manning 'n'"
"	30.000	Pervious Max.infiltration"
"	5.000	Pervious Min.infiltration"
"	0.250	Pervious Lag constant (hours)"
"	5.000	Pervious Depression storage"
"	0.015	Impervious Manning 'n'"
"	0.000	Impervious Max.infiltration"
"	0.000	Impervious Min.infiltration"
"	0.001	Impervious Lag constant (hours)"
"	1.500	Impervious Depression storage"

"	0.665	0.909	0.681	0.691 c.m/sec"
---	-------	-------	-------	----------------

"	Catchment 300	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	3.838	0.702	1.967	minutes"
"	Time to Centroid	114.744	110.663	112.309	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"
"	Rainfall volume	548.24	548.24	1096.48	c.m"
"	Rainfall losses	30.089	5.611	17.850	mm"
"	Runoff depth	51.132	75.610	63.371	mm"
"	Runoff volume	345.14	510.37	855.51	c.m"

"	Runoff coefficient	0.630	0.931	0.780	"
"	Maximum flow	0.315	0.350	0.665	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.665 1.033 0.681 0.691"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.665 1.033 1.033 0.691"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	1.033		c.m/sec"	
"	Hydrograph volume	16661.775		c.m"	
"	0.665 1.033 1.033 1.033"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.665 0.000 1.033 1.033"				
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.652 0.000 1.033 1.033 c.m/sec"				
"	Catchment 700 Pervious Impervious Total Area "				
"	Surface Area 2.980 0.000 2.980 hectare"				
"	Time of concentration 21.322 3.902 21.322 minutes"				
"	Time to Centroid 139.734 115.505 139.734 minutes"				
"	Rainfall depth 81.221 81.221 81.221 mm"				
"	Rainfall volume 2420.38 0.00 2420.38 c.m"				

"	Rainfall losses	28.988	2.703	28.988	mm"
"	Runoff depth	52.233	78.518	52.233	mm"
"	Runoff volume	1556.55	0.00	1556.55	c.m"
"	Runoff coefficient	0.643	0.000	0.643	"
"	Maximum flow	0.652	0.000	0.652	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.652 0.652 1.033 1.033"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.652 0.652 0.652 1.033"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow	0.652		c.m/sec"	
"	Hydrograph volume	1556.551		c.m"	
"	0.652 0.652 0.652 0.652"				
" 40	HYDROGRAPH Confluence 100"				
"	7 Confluence "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.691		c.m/sec"	
"	Hydrograph volume	985.103		c.m"	
"	0.652 0.691 0.652 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.652 0.691 0.691 0.000"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	1.665		c.m/sec"	
"	Hydrograph volume	17646.877		c.m"	
"	0.652 0.691 0.691 1.665"				
" 40	HYDROGRAPH Confluence 200"				
"	7 Confluence "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	1.665		c.m/sec"	
"	Hydrograph volume	17646.877		c.m"	
"	0.652 1.665 0.691 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.652 1.665 1.665 0.000"				
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow	2.153		c.m/sec"	

"	Hydrograph volume	19203.426	c.m"
"	0.652 1.665 1.665	2.153"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	11.691	hectare"
"	Total % impervious	29.656"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Interim__REG.out"
"          Licensee name:                     "
"          Company                             "
"          Date & Time last used:              2/5/2025 at 11:56:08 AM"
" 31      TIME PARAMETERS"
"          60.000  Time Step"
"          2880.000 Max. Storm length"
"          7500.000 Max. Hydrograph"
" 32      STORM Historic"
"          5      Historic"
"          2880.000 Duration"
"          48.000  Rainfall intensity values"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.026      2.026      2.026      2.028"
"                  2.026      6.000      4.000      6.000      13.000"
"                  17.000      13.000      23.000      13.000      13.000"
"                  53.000      38.000      13.000"
"          Maximum intensity                    53.000      mm/hr"
"          Total depth                          285.000      mm"
"          6 000hyd Hydrograph extension used in this file"
" 33      CATCHMENT 600"
"          1 Triangular SCS"
"          1 Equal length"
"          2 Horton equation"
"          600 Catchment 600"
"          5.000 % Impervious"
"          0.120 Total Area"
"          5.000 Flow length"
"          33.000 Overland Slope"
"          0.114 Pervious Area"
"          5.000 Pervious length"
"          33.000 Pervious slope"
"          0.006 Impervious Area"
"          5.000 Impervious length"
"          33.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000 Pervious Min.infiltration"

```

"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.014	0.000	0.000	0.000 c.m/sec"
"		Catchment 600	Pervious	Impervious	Total Area "
"		Surface Area	0.114	0.006	0.120 hectare"
"		Time of concentration	2.369	0.421	2.184 minutes"
"		Time to Centroid	2699.991	2271.477	2659.445 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	324.90	17.10	342.00 c.m"
"		Rainfall losses	157.980	32.780	151.720 mm"
"		Runoff depth	127.020	252.220	133.280 mm"
"		Runoff volume	144.80	15.13	159.94 c.m"
"		Runoff coefficient	0.446	0.885	0.468 "
"		Maximum flow	0.013	0.001	0.014 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.014	0.014	0.000	0.000"
" 33		CATCHMENT 800"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	800	Catchment 800"			
"	5.000	% Impervious"			
"	1.730	Total Area"			
"	40.000	Flow length"			
"	3.750	Overland Slope"			
"	1.643	Pervious Area"			
"	40.000	Pervious length"			
"	3.750	Pervious slope"			
"	0.087	Impervious Area"			
"	40.000	Impervious length"			
"	3.750	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.182	0.014	0.000	0.000 c.m/sec"
"		Catchment 800	Pervious	Impervious	Total Area "
"		Surface Area	1.643	0.087	1.730 hectare"

"	Time of concentration	15.838	2.814	14.776	minutes"
"	Time to Centroid	2719.829	2252.473	2681.704	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	4683.98	246.53	4930.50	c.m"
"	Rainfall losses	139.631	39.672	134.633	mm"
"	Runoff depth	145.370	245.328	150.368	mm"
"	Runoff volume	2389.15	212.21	2601.36	c.m"
"	Runoff coefficient	0.510	0.861	0.528	"
"	Maximum flow	0.171	0.011	0.182	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.182	0.196	0.000	0.000"
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"		0.182	0.196	0.196	0.000"
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow		0.196		c.m/sec"
"	Hydrograph volume		2761.294		c.m"
"		0.182	0.196	0.196	0.196"
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"		0.182	0.000	0.196	0.196"
" 33	CATCHMENT 500"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	500 Catchment 500"				
"	1.000 % Impervious"				
"	14.800 Total Area"				
"	245.000 Flow length"				
"	1.000 Overland Slope"				
"	14.652 Pervious Area"				
"	245.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.148 Impervious Area"				
"	245.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.010 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

"	1.470	0.000	0.196	0.196 c.m/sec"	
"	Catchment 500	Pervious	Impervious	Total Area	"
"	Surface Area	14.652	0.148	14.800	hectare"
"	Time of concentration	69.853	12.412	68.788	minutes"
"	Time to Centroid	2777.725	2293.748	2768.751	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	4.1758	0.0422	4.2180	ha-m"
"	Rainfall losses	138.578	11.153	137.304	mm"
"	Runoff depth	146.422	273.848	147.696	mm"
"	Runoff volume	2.1454	0.0405	2.1859	ha-m"
"	Runoff coefficient	0.514	0.961	0.518	"
"	Maximum flow	1.454	0.018	1.470	c.m/sec"

" 40 HYDROGRAPH Add Runoff "

"	4	Add Runoff "		
"	1.470	1.470	0.196	0.196"

" 33 CATCHMENT 100"

"	1	Triangular SCS"
"	1	Equal length"
"	2	Horton equation"
"	100	Catchment 100"
"	80.000	% Impervious"
"	13.090	Total Area"
"	40.000	Flow length"
"	2.000	Overland Slope"
"	2.618	Pervious Area"
"	40.000	Pervious length"
"	2.000	Pervious slope"
"	10.472	Impervious Area"
"	40.000	Impervious length"
"	2.000	Impervious slope"
"	0.250	Pervious Manning 'n' "
"	30.000	Pervious Max.infiltration"
"	5.000	Pervious Min.infiltration"
"	0.250	Pervious Lag constant (hours)"
"	5.000	Pervious Depression storage"
"	0.015	Impervious Manning 'n' "
"	0.000	Impervious Max.infiltration"
"	0.000	Impervious Min.infiltration"
"	0.010	Impervious Lag constant (hours)"
"	1.500	Impervious Depression storage"

"	1.584	1.470	0.196	0.196 c.m/sec"	
"	Catchment 100	Pervious	Impervious	Total Area	"
"	Surface Area	2.618	10.472	13.090	hectare"
"	Time of concentration	19.125	3.398	5.426	minutes"
"	Time to Centroid	2724.073	2240.649	2302.974	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	0.7461	2.9845	3.7307	ha-m"
"	Rainfall losses	139.363	39.000	59.073	mm"
"	Runoff depth	145.637	246.000	225.928	mm"
"	Runoff volume	0.3813	2.5761	2.9574	ha-m"

"	Runoff coefficient	0.511	0.863	0.793	"
"	Maximum flow	0.264	1.323	1.584	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	1.584 2.676 0.196 0.196"				
" 33	CATCHMENT 200"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	200 Catchment 200"				
"	15.000 % Impervious"				
"	2.020 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	1.717 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	0.303 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.010 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.210 2.676 0.196 0.196 c.m/sec"				
"	Catchment 200 Pervious Impervious Total Area "				
"	Surface Area 1.717 0.303 2.020 hectare"				
"	Time of concentration 19.125 3.398 15.514 minutes"				
"	Time to Centroid 2724.073 2240.649 2613.063 minutes"				
"	Rainfall depth 285.000 285.000 285.000 mm"				
"	Rainfall volume 4893.45 863.55 5757.00 c.m"				
"	Rainfall losses 139.363 39.000 124.309 mm"				
"	Runoff depth 145.637 246.000 160.691 mm"				
"	Runoff volume 2500.58 745.38 3245.96 c.m"				
"	Runoff coefficient 0.511 0.863 0.564 "				
"	Maximum flow 0.173 0.038 0.210 c.m/sec"				
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.210 2.876 0.196 0.196"				
" 54	POND DESIGN"				
"	2.876 Current peak flow c.m/sec"				
"	3.341 Target outflow c.m/sec"				
"	54678.9 Hydrograph volume c.m"				
"	18. Number of stages"				

```

"      421.500  Minimum water level      metre"
"      423.200  Maximum water level      metre"
"      421.500  Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"      421.500      0.000      0.000"
"      421.600      0.00700  1070.100"
"      421.700      0.01300  2176.600"
"      421.800      0.01900  3319.800"
"      421.900      0.02300  4500.000"
"      422.000      0.02600  5717.200"
"      422.100      0.07100  6977.200"
"      422.200      0.1940   8275.500"
"      422.300      0.3520  9602.300"
"      422.400      0.3950  10957.80"
"      422.500      0.5140  12342.10"
"      422.600      0.7980  13755.30"
"      422.700      0.9580  15197.70"
"      422.800      1.614   16669.40"
"      422.900      2.846   18170.60"
"      423.000      4.482   19701.40"
"      423.100      6.460   21262.00"
"      423.200      8.746   22852.50"
"          Peak outflow              2.741      c.m/sec"
"          Maximum level              422.892      metre"
"          Maximum storage            18043.141      c.m"
"          Centroidal lag              53.312      hours"
"          0.210      2.876      2.741      0.196 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5      Next link "
"          0.210      2.741      2.741      0.196"
" 33      CATCHMENT 400"
"          1      Triangular SCS"
"          1      Equal length"
"          2      Horton equation"
"          400      Catchment 400"
"          0.000      % Impervious"
"          3.330      Total Area"
"          120.000      Flow length"
"          3.000      Overland Slope"
"          3.330      Pervious Area"
"          120.000      Pervious length"
"          3.000      Pervious slope"
"          0.000      Impervious Area"
"          120.000      Impervious length"
"          3.000      Impervious slope"
"          0.250      Pervious Manning 'n'"
"          30.000      Pervious Max.infiltration"
"          5.000      Pervious Min.infiltration"
"          0.250      Pervious Lag constant (hours)"

```


"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.366	2.741	2.741	0.196 c.m/sec"
"		Catchment 400	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	32.738	5.817	32.738 minutes"
"		Time to Centroid	2737.685	2233.110	2737.684 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	9490.50	0.01	9490.51 c.m"
"		Rainfall losses	139.700	29.327	139.700 mm"
"		Runoff depth	145.300	255.674	145.301 mm"
"		Runoff volume	4838.50	0.01	4838.51 c.m"
"		Runoff coefficient	0.510	0.000	0.510 "
"		Maximum flow	0.366	0.000	0.366 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.366	3.107	2.741	0.196"
" 33		CATCHMENT 300"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	300	Catchment 300"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.165	3.107	2.741	0.196 c.m/sec"
"		Catchment 300	Pervious	Impervious	Total Area "
"		Surface Area	0.675	0.675	1.350 hectare"
"		Time of concentration	6.894	1.225	3.197 minutes"

"	Time to Centroid	2702.037	2279.379	2426.416	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	1923.75	1923.75	3847.50	c.m"
"	Rainfall losses	153.479	38.462	95.971	mm"
"	Runoff depth	131.521	246.538	189.030	mm"
"	Runoff volume	887.77	1664.13	2551.90	c.m"
"	Runoff coefficient	0.461	0.865	0.663	"
"	Maximum flow	0.077	0.088	0.165	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.165 3.222 2.741 0.196"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.165 3.222 3.222 0.196"				
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow 3.222 c.m/sec"				
"	Hydrograph volume 60356.441 c.m"				
"	0.165 3.222 3.222 3.222"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.165 0.000 3.222 3.222"				
" 33	CATCHMENT 700"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	700 Catchment 700"				
"	0.000 % Impervious"				
"	2.980 Total Area"				
"	90.000 Flow length"				
"	1.000 Overland Slope"				
"	2.980 Pervious Area"				
"	90.000 Pervious length"				
"	1.000 Pervious slope"				
"	0.000 Impervious Area"				
"	90.000 Impervious length"				
"	1.000 Impervious slope"				
"	0.250 Pervious Manning 'n' "				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n' "				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.010 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	0.327 0.000 3.222 3.222 c.m/sec"				

	Catchment 700	Pervious	Impervious	Total Area	
"	Surface Area	2.980	0.000	2.980	hectare"
"	Time of concentration	38.303	6.806	38.303	minutes"
"	Time to Centroid	2741.219	2241.540	2741.218	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	8493.00	0.01	8493.01	c.m"
"	Rainfall losses	141.568	24.635	141.568	mm"
"	Runoff depth	143.432	260.365	143.432	mm"
"	Runoff volume	4274.27	0.01	4274.27	c.m"
"	Runoff coefficient	0.503	0.000	0.503	"
"	Maximum flow	0.327	0.000	0.327	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.327 0.327	3.222	3.222"		
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.327 0.327	0.327	3.222"		
" 40	HYDROGRAPH Combine 300"				
"	6 Combine "				
"	300 Node #"				
"	To West Farm Field"				
"	Maximum flow	0.327	c.m/sec"		
"	Hydrograph volume	4274.274	c.m"		
"	0.327 0.327	0.327	0.327"		
" 40	HYDROGRAPH Confluence 100"				
"	7 Confluence "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.196	c.m/sec"		
"	Hydrograph volume	2761.294	c.m"		
"	0.327 0.196	0.327	0.000"		
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.327 0.196	0.196	0.000"		
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	3.399	c.m/sec"		
"	Hydrograph volume	63117.754	c.m"		
"	0.327 0.196	0.196	3.399"		
" 40	HYDROGRAPH Confluence 200"				
"	7 Confluence "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	3.399	c.m/sec"		
"	Hydrograph volume	63117.754	c.m"		
"	0.327 3.399	0.196	0.000"		
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				

"	0.327	3.399	3.399	0.000"	
" 40	HYDROGRAPH	Combine	300"		
"	6	Combine "			
"	300	Node #"			
"	To West Farm Field"				
"	Maximum flow	3.726		c.m/sec"	
"	Hydrograph volume	67392.039		c.m"	
"	0.327	3.399	3.399	3.726"	
" 38	START/RE-START TOTALS	200"			
"	3	Runoff Totals on EXIT"			
"	Total Catchment area	39.420		hectare"	
"	Total Impervious area	11.691		hectare"	
"	Total % impervious	29.656"			
" 19	EXIT"				

C.3. Ultimate Post-Development Conditions Modelling

NORTH LANDS SUBDIVISION
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)
Our File: 422079
March 4, 2025

Proposed Forebay

Forebay Length =	140.0 m	(Dist)
Forebay Top Width =	27.0 m	
Active Forebay Depth =	1.0 m	(d)
Active Forebay Bottom Width =	21.0 m	
Approximate Permanent Forebay Pool Volume =	224.9 m ³	
Length Width Ratio =	5.2 :1	(r)
25 mm Storm Pond Outlet Flowrate =	0.043 m ³ /s	(Q25mm)
5 Year Storm Inflow Rate =	8.626 m ³ /s	(Q5)
Desired Forebay Velocity =	0.500 m/s	(Vf)
Desired Settling Velocity (recommended) =	0.0003 m/s	(Vs)

Settling Length

$$\text{Dist} = ((r \times Q_{25\text{mm}})/V_s)^{.5} = 27.3 \text{ m} \quad 25\text{mm}$$

Forebay length (140 m) exceeds the settling length (27.3 m).

Dispersion Length

$$\text{Dist} = (8 \times Q_5)/(d \times V_f) = 138.0 \text{ m} \quad 5 \text{ Year}$$

Forebay length (140 m) exceeds the dispersion length (138.0 m).

Flow Velocity in Forebay

Cross-sectional Area (Forebay Only) =	24 m ²	
Cross-sectional Area (With Permanent Pool) =	41.85 m ²	
Cross-sectional Area (With Outlet Pool) =	57.85 m ²	(A)
Q5 =	8.626 m ³ /s	
Velocity = Q5/A =	0.149 m/s	5 Year

The average flow velocity through the forebay is equal to the allowable velocity of 0.15 m/s.

NORTH LANDS SUBDIVISION
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)
 Our File: 422079
 March 4, 2025

SWM Facility - Stage/Storage Volume Calculations

Forebay/Permanent Pool Storage Volume Calculations

Elevation (m)	Depth (m)	Forebay Surface Area (m ²)	Forebay Incremental Storage Volume (m ³)	Perm. Pool Surface Area (m ²)	Perm. Pool Incremental Storage Volume (m ³)	Accumulative Volume (m ³)	
420.20	0.00	0.0	0.0			0.0	Bottom of Forebay
420.40	0.20	817.9	81.79			81.8	
420.60	0.40	902.4	172.03			253.8	
420.80	0.60	989.3	189.17			443.0	
421.00	0.80	1,078.6	206.79			649.8	
421.20	1.00	1,170.2	224.88	9,630.00	0.00	874.7	Bottom of Permanent Pool
421.30	1.10			9,798.00	971.40	1,846.1	
421.40	1.20			10,157.40	997.77	2,843.8	
421.50	1.30			10,518.80	1,033.81	3,877.6	Top of Permanent Pool

Active Storage Volume Calculations

Elevation (m)	Depth (m)	Active Surface Area (m ²)	Active Incremental Volume (m ³)	Accumulative Active Volume (m ³)	
421.50	0.00	10,518.8	0.00	0.00	Bottom of Active Storage
421.60	0.10	10,882.4	1,070.06	1,070.06	
421.70	0.20	11,248.2	1,106.53	2,176.59	
421.80	0.30	11,616.3	1,143.23	3,319.82	
421.90	0.40	11,986.6	1,180.15	4,499.96	
422.00	0.50	12,359.0	1,217.28	5,717.24	T/G DICB.1
422.10	0.60	12,841.0	1,260.00	6,977.24	
422.20	0.70	13,125.1	1,298.31	8,275.55	
422.30	0.80	13,410.9	1,326.80	9,602.35	T/G DICB.2
422.40	0.90	13,698.3	1,355.46	10,957.81	
422.50	1.00	13,987.2	1,384.27	12,342.08	
422.60	1.10	14,277.9	1,413.26	13,755.34	Weir
422.70	1.20	14,570.1	1,442.40	15,197.74	
422.80	1.30	14,864.0	1,471.71	16,669.44	
422.90	1.40	15,159.4	1,501.17	18,170.61	
423.00	1.50	15,456.5	1,530.80	19,701.41	
423.10	1.60	15,755.3	1,560.59	21,262.00	Top of Pond
423.20	1.70	16,055.6	1,590.55	22,852.54	

1800 x1800 Structure Controls

Orifice Outlet (Extended Detention)

modelled with 50% blockage

INV = 421.50 m
 Q = 0.044 m³/s
 Cd = 0.600
 H = 1.100 m
 2g = 19.620
 A = 0.031 m²
 D = 0.200 m

Overflow Weir

d1 = 1.500 m
 h = 1.200
 H = 0.300 m
 2g = 19.620
 L = 15.0 m
 Q = 3.524 m³/s

$$\text{Orifice Flow} = Cd A \sqrt{2gH}$$

Cd = Discharge Coefficient
 A = Area of Orifice
 2g = 19.62
 H = Depth of Water above orifice - half of orifice diameter

Major Control - Flow Over Grate

modelled with 50% blockage

d1 = 0.80 m
 h = 0.50
 H = 0.30 m
 2g = 19.62
 L = 3.66 m
 Q = 0.453 m³/s

Length of Weir

Head over Grate (m)	Length (m)
0	1.200
0.1	1.832
0.2	2.464
0.3	3.66

Pipe Outflow - Outlet 1

INV. = 421.34 m
 Diameter = 525 mm
 Gradient = 0.50%
 Pipe Capacity = 0.317 m³/s
 Length = 21.30 m

Pipe Outflow - Outlet 2

INV. = 421.5 m
 Diameter = 600 mm
 Gradient = 1%
 Pipe Capacity = 0.641 m³/s
 Length = 20.30 m

$$\text{Weir Flow} = 0.433 \sqrt{2g\left(\frac{d}{d+h}\right)} LH^{3/2}$$

L = Length of Weir
 2g = 19.62
 d = total depth of water
 h = depth of water below weir
 H = depth of water above weir

Stage-Storage-Discharge Table										
Elevation (m)	Stage (m)	Storage (m ³)	OUTLET STRUCTURE 1		OUTLET STRUCTURE 2			Weir Overflow (m ³ /s)	Actual Discharge (m ³ /s)	
			Major Control Grate (m ³ /s)	Major Control Pipe Outlet (m ³ /s)	200mm dia. Minor Outlet (m ³ /s)	Major Control Grate (m ³ /s)	Major Control Pipe Outlet (m ³ /s)			
421.50	0.00	0.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	Bottom of Active Storage
421.60	0.10	1,070.1	0.000	0.152	0.007	0.000	0.039	0.000	0.007	
421.70	0.20	2,176.6	0.000	0.250	0.013	0.000	0.144	0.000	0.013	
421.80	0.30	3,319.8	0.000	0.317	0.019	0.000	0.307	0.000	0.019	
421.90	0.40	4,500.0	0.000	0.317	0.023	0.000	0.485	0.000	0.023	
422.00	0.50	5,717.2	0.000	0.317	0.026	0.000	0.621	0.000	0.026	T/G DICB.1
422.10	0.60	6,977.2	0.041	0.317	0.030	0.000	0.641	0.000	0.071	
422.20	0.70	8,275.5	0.161	0.317	0.032	0.000	0.641	0.000	0.194	
422.30	0.80	9,602.3	0.453	0.317	0.035	0.000	0.641	0.000	0.352	T/G DICB.2
422.40	0.90	10,957.8		0.317	0.037	0.040	0.641	0.000	0.395	
422.50	1.00	12,342.1		0.317	0.040	0.158	0.641	0.000	0.514	
422.60	1.10	13,755.3		0.317	0.042	0.439	0.641	0.000	0.798	Weir
422.70	1.20	15,197.7		0.317	0.044	0.689	0.641	0.000	0.958	
422.80	1.30	16,669.4		0.317			0.641	0.656	1.614	
422.90	1.40	18,170.6		0.317			0.641	1.888	2.846	
423.00	1.50	19,701.4		0.317			0.641	3.524	4.482	
423.10	1.60	21,262.0		0.317			0.641	5.502	6.460	Top of Pond
423.20	1.70	22,852.5		0.317			0.641	7.788	8.746	

Notes:

Major Controls - the minimum of flow over grate and pipe discharge flow rate is used in the actual discharge calculation

Knockout Controls - the knockout is assumed to contribute to discharge flow rates until the pipe discharge rate is the controlling release rate.

Major Control Pipe Flow - based on Pipe Capacity

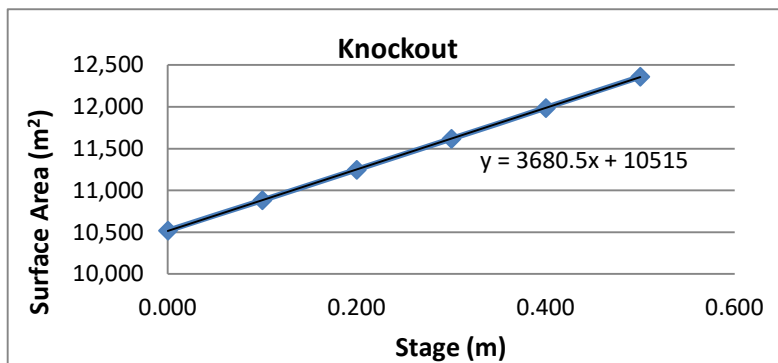
NORTH LANDS SUBDIVISION
TOWNSHIP OF CENTRE WELLINGTON (FERGUS)

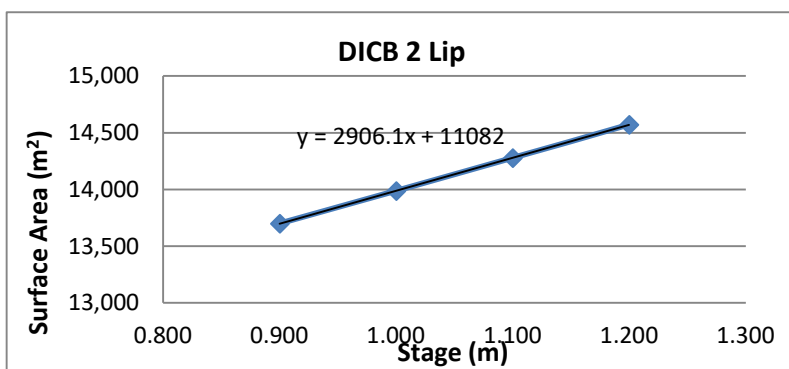
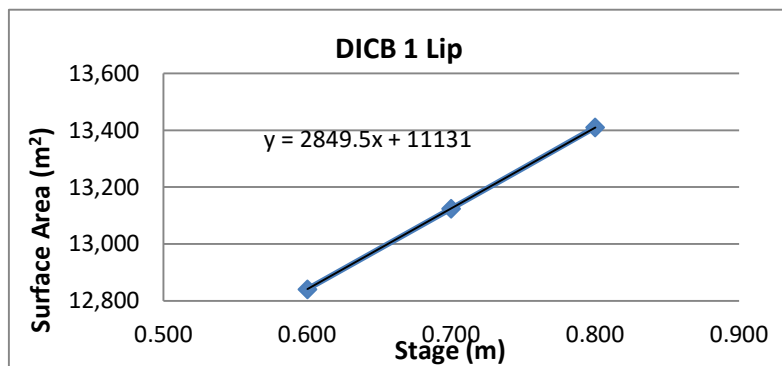
Our File: 422079

SWM Facility - Drawdown Calculations

Drawdown Calculations

Elevation	Stage	Surface area	
	(m)	(m ²)	
421.50	0.000	10,519	Bottom of Active Storage
421.60	0.100	10,882	
421.70	0.200	11,248	
421.80	0.300	11,616	
421.90	0.400	11,987	
422.00	0.500	12,359	T/G DICB.1
422.10	0.600	12,841	
422.20	0.700	13,125	T/G DICB.2
422.30	0.800	13,411	
422.40	0.900	13,698	
422.50	1.000	13,987	Weir
422.60	1.100	14,278	
422.70	1.200	14,570	
422.80	1.300	14,864	
422.90	1.400	15,159	
423.00	1.500	15,457	
423.10	1.600	15,755	
423.20	1.700	16,056	Top of Pond





$$t = \frac{0.66C_2h^{1.5} + 2C_3h^{0.5}}{2.75A_0}$$

Eq. 4.11 (MOE, 2003)

Knockout 1

Given: $d = 0.200$ m
 $A_0 = 0.031$ m
 $C_2 = 3680.5$
 $C_3 = 10515$

DCB Lip 1

Given: $d = 0.525$ m
 $A_0 = 0.216$ m
 $C_2 = 2489.5$
 $C_3 = 11131$

DCB Lip 2

Given: $d = 0.600$ m
 $A_0 = 0.283$ m
 $C_2 = 2906.1$
 $C_3 = 11082$

Storm	Ponding Depth	Knockout 1 h (m)	Knockout 1 Drawdown (hr)	DCB 1 Lip h (m)	DCB 1 Drawdown (hr)	DCB 2 Lip h (m)	DCB 2 Drawdown (hr)	Total Drawdown (hr)
25 mm	422.04	0.50	50.6	0.00	0.0	0.00	0.0	50.6
2-Year	422.24	0.50	50.6	0.24	5.2	0.00	0.0	55.8
5-Year	422.41	0.50	50.6	0.41	6.9	0.00	0.0	57.4
10-Year	422.52	0.50	50.6	0.30	5.8	0.22	3.8	60.2
25-Year	422.62	0.50	50.6	0.30	5.8	0.32	4.6	61.0
50-Year	422.71	0.50	50.6	0.30	5.8	0.40	5.2	61.6
100-Year	422.77	0.50	50.6	0.30	5.8	0.40	5.2	61.6
Regional	422.95	0.50	50.6	0.30	5.8	0.40	5.2	61.6

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      UnconPost_25mm.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/5/2025 at 2:23:14 PM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          367.000  Coefficient A"
"          5.000  Constant B"
"          0.700  Exponent C"
"          0.394  Fraction R"
"          120.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity                      72.993  mm/hr"
"          Total depth                          24.995  mm"
"          7  0025hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000  % Impervious"
"          0.120  Total Area"
"          55.000  Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000  Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000  Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.005	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	26.581	3.205	13.523	minutes"
"		Time to Centroid	88.923	64.163	75.092	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	22.50	7.50	29.99	c.m"
"		Rainfall losses	18.914	1.906	14.662	mm"
"		Runoff depth	6.081	23.090	10.333	mm"
"		Runoff volume	5.47	6.93	12.40	c.m"
"		Runoff coefficient	0.243	0.924	0.413	"
"		Maximum flow	0.002	0.004	0.005	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.005	0.005	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.032	0.005	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	3.071	0.370	2.655	minutes"
"		Time to Centroid	63.738	60.371	63.219	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	132.98	7.00	139.97	c.m"
"		Rainfall losses	19.084	4.536	18.356	mm"
"		Runoff depth	5.912	20.459	6.639	mm"

"	Runoff volume	31.45	5.73	37.18	c.m"
"	Runoff coefficient	0.237	0.819	0.266	"
"	Maximum flow	0.030	0.005	0.032	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.032	0.037	0.000	0.000"
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		3.692	0.037	0.000	0.000 c.m/sec"
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	26.613	3.209	4.655	minutes"
"	Time to Centroid	88.960	64.168	65.700	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	1577.21	6308.82	7886.03	c.m"
"	Rainfall losses	18.914	1.906	5.307	mm"
"	Runoff depth	6.082	23.089	19.688	mm"
"	Runoff volume	383.76	5827.78	6211.54	c.m"
"	Runoff coefficient	0.243	0.924	0.788	"
"	Maximum flow	0.150	3.664	3.692	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		3.692	3.729	0.000	0.000"
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	2000	Catchment 2000"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.056	3.729	0.000	0.000 c.m/sec"	
"		Catchment 2000	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	24.798	2.990	16.045	minutes"
"		Time to Centroid	87.039	63.901	77.753	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	429.17	75.74	504.91	c.m"
"		Rainfall losses	18.913	1.889	16.360	mm"
"		Runoff depth	6.082	23.106	8.636	mm"
"		Runoff volume	104.43	70.01	174.44	c.m"
"		Runoff coefficient	0.243	0.924	0.345	"
"		Maximum flow	0.045	0.045	0.056	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.056	3.781	0.000	0.000"	
" 33		CATCHMENT 4000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	4000	Catchment 4000"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				

"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.056	3.781	0.000	0.000 c.m/sec"	
"		Catchment 4000	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	42.448	5.118	42.448	minutes"
"		Time to Centroid	105.920	66.672	105.919	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	832.34	0.00	832.34	c.m"
"		Rainfall losses	18.910	1.665	18.910	mm"
"		Runoff depth	6.085	23.330	6.085	mm"
"		Runoff volume	202.64	0.00	202.64	c.m"
"		Runoff coefficient	0.243	0.000	0.243	"
"		Maximum flow	0.056	0.000	0.056	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.056	3.787	0.000	0.000"	
" 33		CATCHMENT 3000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	3000	Catchment 3000"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.121	3.787	0.000	0.000 c.m/sec"	
"		Catchment 3000	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	8.939	1.078	2.724	minutes"
"		Time to Centroid	70.037	61.193	63.045	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	168.72	168.72	337.44	c.m"
"		Rainfall losses	18.924	2.080	10.502	mm"
"		Runoff depth	6.071	22.916	14.493	mm"
"		Runoff volume	40.98	154.68	195.66	c.m"
"		Runoff coefficient	0.243	0.917	0.580	"
"		Maximum flow	0.031	0.118	0.121	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.121	3.876	0.000	0.000"	
" 33		CATCHMENT 7000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	7000	Catchment 7000"				
"	0.000	% Impervious"				
"	0.490	Total Area"				
"	7.500	Flow length"				
"	33.000	Overland Slope"				
"	0.490	Pervious Area"				
"	7.500	Pervious length"				
"	33.000	Pervious slope"				
"	0.000	Impervious Area"				
"	7.500	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.025	3.876	0.000	0.000 c.m/sec"	
"		Catchment 7000	Pervious	Impervious	Total Area	"
"		Surface Area	0.490	0.000	0.490	hectare"
"		Time of concentration	3.917	0.472	3.917	minutes"
"		Time to Centroid	64.675	60.746	64.675	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	122.48	0.00	122.48	c.m"
"		Rainfall losses	19.020	3.993	19.020	mm"
"		Runoff depth	5.975	21.002	5.975	mm"

"	Runoff volume	29.28	0.00	29.28	c.m"
"	Runoff coefficient	0.239	0.000	0.239	"
"	Maximum flow	0.025	0.000	0.025	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.025	3.901	0.000	0.000"	
" 38	START/RE-START TOTALS 7000"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			39.420	hectare"
"	Total Impervious area			26.276	hectare"
"	Total % impervious			66.657"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\"
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    UnconPost_2yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:25:17 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          414.876 Coefficient A"
"          0.027  Constant B"
"          0.682  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          100.235  mm/hr"
"          Total depth                39.504  mm"
"          6  002hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.009	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	15.715	2.823	9.662	minutes"
"		Time to Centroid	122.763	115.748	119.469	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	35.55	11.85	47.40	c.m"
"		Rainfall losses	25.414	2.086	19.582	mm"
"		Runoff depth	14.090	37.418	19.922	mm"
"		Runoff volume	12.68	11.23	23.91	c.m"
"		Runoff coefficient	0.357	0.947	0.504	"
"		Maximum flow	0.008	0.007	0.009	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.009	0.009	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.105	0.009	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.816	0.326	1.648	minutes"
"		Time to Centroid	104.196	112.311	105.112	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	210.16	11.06	221.22	c.m"
"		Rainfall losses	25.568	5.814	24.580	mm"
"		Runoff depth	13.936	33.690	14.924	mm"

"	Runoff volume	74.14	9.43	83.57	c.m"
"	Runoff coefficient	0.353	0.853	0.378	"
"	Maximum flow	0.098	0.007	0.105	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.105	0.114	0.000	0.000"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	6.428	0.114	0.000	0.000 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	15.735	2.827	3.937	minutes"
"	Time to Centroid	122.788	115.756	116.361	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	0.2493	0.9971	1.2464	ha-m"
"	Rainfall losses	25.416	2.089	6.754	mm"
"	Runoff depth	14.088	37.415	32.750	mm"
"	Runoff volume	0.0889	0.9444	1.0333	ha-m"
"	Runoff coefficient	0.357	0.947	0.829	"
"	Maximum flow	0.554	6.308	6.428	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	6.428	6.542	0.000	0.000"	
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	2000	Catchment 2000"			
"	15.000	% Impervious"			
"	2.020	Total Area"			
"	40.000	Flow length"			
"	2.000	Overland Slope"			
"	1.717	Pervious Area"			
"	40.000	Pervious length"			
"	2.000	Pervious slope"			
"	0.303	Impervious Area"			
"	40.000	Impervious length"			
"	2.000	Impervious slope"			
"	0.250	Pervious Manning 'n' "			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n' "			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.170 6.542 0.000 0.000 c.m/sec"			
"		Catchment 2000 Pervious Impervious Total Area "			
"		Surface Area 1.717 0.303 2.020 hectare"			
"		Time of concentration 14.661 2.634 10.821 minutes"			
"		Time to Centroid 121.346 115.356 119.434 minutes"			
"		Rainfall depth 39.504 39.504 39.504 mm"			
"		Rainfall volume 678.28 119.70 797.98 c.m"			
"		Rainfall losses 25.379 1.965 21.867 mm"			
"		Runoff depth 14.125 37.539 17.637 mm"			
"		Runoff volume 242.53 113.74 356.27 c.m"			
"		Runoff coefficient 0.358 0.950 0.446 "			
"		Maximum flow 0.155 0.077 0.170 c.m/sec"			
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.170 6.655 0.000 0.000"			
" 33		CATCHMENT 4000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	4000	Catchment 4000"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			

"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.193	6.655	0.000	0.000 c.m/sec"	
"		Catchment 4000	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	25.097	4.509	25.096	minutes"
"		Time to Centroid	135.157	118.349	135.157	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	1315.48	0.00	1315.48	c.m"
"		Rainfall losses	25.393	1.692	25.393	mm"
"		Runoff depth	14.111	37.813	14.111	mm"
"		Runoff volume	469.88	0.00	469.89	c.m"
"		Runoff coefficient	0.357	0.000	0.357	"
"		Maximum flow	0.193	0.000	0.193	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.193	6.685	0.000	0.000"	
" 33		CATCHMENT 3000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	3000	Catchment 3000"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"	0.228	6.685	0.000	0.000	c.m/sec"	
"	Catchment 3000	Pervious	Impervious	Total Area	"	
"	Surface Area	0.675	0.675	1.350	hectare"	
"	Time of concentration	5.285	0.949	2.157	minutes"	
"	Time to Centroid	108.893	112.435	111.449	minutes"	
"	Rainfall depth	39.504	39.504	39.504	mm"	
"	Rainfall volume	266.65	266.65	533.30	c.m"	
"	Rainfall losses	25.407	2.971	14.189	mm"	
"	Runoff depth	14.097	36.533	25.315	mm"	
"	Runoff volume	95.16	246.59	341.75	c.m"	
"	Runoff coefficient	0.357	0.925	0.641	"	
"	Maximum flow	0.106	0.170	0.228	c.m/sec"	
" 40	HYDROGRAPH Add Runoff "					
"	4	Add Runoff "				
"	0.228	6.912	0.000	0.000"		
" 33	CATCHMENT 7000"					
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	7000	Catchment 7000"				
"	0.000	% Impervious"				
"	0.490	Total Area"				
"	7.500	Flow length"				
"	33.000	Overland Slope"				
"	0.490	Pervious Area"				
"	7.500	Pervious length"				
"	33.000	Pervious slope"				
"	0.000	Impervious Area"				
"	7.500	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"	0.082	6.912	0.000	0.000	c.m/sec"	
"	Catchment 7000	Pervious	Impervious	Total Area	"	
"	Surface Area	0.490	0.000	0.490	hectare"	
"	Time of concentration	2.316	0.416	2.316	minutes"	
"	Time to Centroid	104.877	112.801	104.877	minutes"	
"	Rainfall depth	39.504	39.504	39.504	mm"	
"	Rainfall volume	193.57	0.00	193.57	c.m"	
"	Rainfall losses	25.440	5.168	25.440	mm"	
"	Runoff depth	14.064	34.336	14.064	mm"	

"	Runoff volume	68.91	0.00	68.91	c.m"
"	Runoff coefficient	0.356	0.000	0.356	"
"	Maximum flow	0.082	0.000	0.082	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.082	6.995	0.000	0.000"	
" 38	START/RE-START TOTALS 7000"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			39.420	hectare"
"	Total Impervious area			26.276	hectare"
"	Total % impervious			66.657"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    UnconPost_5yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:27:24 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          544.711 Coefficient A"
"          0.021  Constant B"
"          0.686  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          130.581  mm/hr"
"          Total depth                50.743  mm"
"          6  005hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"			
"		0.016	0.000	0.000	0.000 c.m/sec"
"		Catchment 5000	Pervious	Impervious	Total Area "
"		Surface Area	0.090	0.030	0.120 hectare"
"		Time of concentration	14.001	2.540	9.329 minutes"
"		Time to Centroid	122.721	114.328	119.300 minutes"
"		Rainfall depth	50.743	50.743	50.743 mm"
"		Rainfall volume	45.67	15.22	60.89 c.m"
"		Rainfall losses	27.152	2.035	20.873 mm"
"		Runoff depth	23.590	48.708	29.870 mm"
"		Runoff volume	21.23	14.61	35.84 c.m"
"		Runoff coefficient	0.465	0.960	0.589 "
"		Maximum flow	0.013	0.010	0.016 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.016	0.016	0.000	0.000"
" 33		CATCHMENT 6000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	6000	Catchment 6000"			
"	5.000	% Impervious"			
"	0.560	Total Area"			
"	5.000	Flow length"			
"	33.000	Overland Slope"			
"	0.532	Pervious Area"			
"	5.000	Pervious length"			
"	33.000	Pervious slope"			
"	0.028	Impervious Area"			
"	5.000	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.163	0.016	0.000	0.000 c.m/sec"
"		Catchment 6000	Pervious	Impervious	Total Area "
"		Surface Area	0.532	0.028	0.560 hectare"
"		Time of concentration	1.618	0.293	1.500 minutes"
"		Time to Centroid	105.803	111.144	106.279 minutes"
"		Rainfall depth	50.743	50.743	50.743 mm"
"		Rainfall volume	269.95	14.21	284.16 c.m"
"		Rainfall losses	27.440	7.450	26.440 mm"
"		Runoff depth	23.303	43.293	24.303 mm"

"	Runoff volume	123.97	12.12	136.10	c.m"
"	Runoff coefficient	0.459	0.853	0.479	"
"	Maximum flow	0.154	0.009	0.163	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.163	0.177	0.000	0.000"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	8.626	0.177	0.000	0.000 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	14.018	2.543	3.782	minutes"
"	Time to Centroid	122.745	114.334	115.243	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	0.3202	1.2808	1.6009	ha-m"
"	Rainfall losses	27.151	2.037	7.060	mm"
"	Runoff depth	23.592	48.706	43.683	mm"
"	Runoff volume	0.1489	1.2293	1.3782	ha-m"
"	Runoff coefficient	0.465	0.960	0.861	"
"	Maximum flow	0.936	8.331	8.626	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	8.626	8.803	0.000	0.000"	
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	2000	Catchment 2000"			
"	15.000	% Impervious"			
"	2.020	Total Area"			
"	40.000	Flow length"			
"	2.000	Overland Slope"			
"	1.717	Pervious Area"			
"	40.000	Pervious length"			
"	2.000	Pervious slope"			
"	0.303	Impervious Area"			
"	40.000	Impervious length"			
"	2.000	Impervious slope"			
"	0.250	Pervious Manning 'n' "			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n' "			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.279 8.803 0.000 0.000 c.m/sec"			
"		Catchment 2000 Pervious Impervious Total Area "			
"		Surface Area 1.717 0.303 2.020 hectare"			
"		Time of concentration 13.062 2.369 10.193 minutes"			
"		Time to Centroid 121.452 114.097 119.479 minutes"			
"		Rainfall depth 50.743 50.743 50.743 mm"			
"		Rainfall volume 871.26 153.75 1025.01 c.m"			
"		Rainfall losses 27.259 1.941 23.461 mm"			
"		Runoff depth 23.484 48.802 27.282 mm"			
"		Runoff volume 403.22 147.87 551.10 c.m"			
"		Runoff coefficient 0.463 0.962 0.538 "			
"		Maximum flow 0.259 0.101 0.279 c.m/sec"			
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.279 8.994 0.000 0.000"			
" 33		CATCHMENT 4000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	4000	Catchment 4000"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			

"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.356	8.994	0.000	0.000 c.m/sec"	
"		Catchment 4000	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	22.359	4.056	22.359	minutes"
"		Time to Centroid	134.036	116.866	134.036	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	1689.74	0.00	1689.74	c.m"
"		Rainfall losses	27.188	2.068	27.188	mm"
"		Runoff depth	23.555	48.675	23.555	mm"
"		Runoff volume	784.37	0.00	784.38	c.m"
"		Runoff coefficient	0.464	0.000	0.464	"
"		Maximum flow	0.356	0.000	0.356	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.356	9.065	0.000	0.000"	
" 33		CATCHMENT 3000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	3000	Catchment 3000"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.347	9.065	0.000	0.000 c.m/sec"	
"		Catchment 3000	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	4.708	0.854	2.132	minutes"
"		Time to Centroid	110.182	111.691	111.191	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	342.51	342.51	685.03	c.m"
"		Rainfall losses	27.326	3.537	15.432	mm"
"		Runoff depth	23.417	47.206	35.311	mm"
"		Runoff volume	158.07	318.64	476.70	c.m"
"		Runoff coefficient	0.461	0.930	0.696	"
"		Maximum flow	0.157	0.219	0.347	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.347	9.412	0.000	0.000"	
" 33		CATCHMENT 7000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	7000	Catchment 7000"				
"	0.000	% Impervious"				
"	0.490	Total Area"				
"	7.500	Flow length"				
"	33.000	Overland Slope"				
"	0.490	Pervious Area"				
"	7.500	Pervious length"				
"	33.000	Pervious slope"				
"	0.000	Impervious Area"				
"	7.500	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.136	9.412	0.000	0.000 c.m/sec"	
"		Catchment 7000	Pervious	Impervious	Total Area	"
"		Surface Area	0.490	0.000	0.490	hectare"
"		Time of concentration	2.063	0.374	2.063	minutes"
"		Time to Centroid	106.443	111.657	106.443	minutes"
"		Rainfall depth	50.743	50.743	50.743	mm"
"		Rainfall volume	248.64	0.00	248.64	c.m"
"		Rainfall losses	27.370	6.545	27.370	mm"
"		Runoff depth	23.373	44.198	23.373	mm"

"	Runoff volume	114.53	0.00	114.53	c.m"
"	Runoff coefficient	0.461	0.000	0.461	"
"	Maximum flow	0.136	0.000	0.136	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.136	9.548	0.000	0.000"	
" 38	START/RE-START TOTALS 7000"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			39.420	hectare"
"	Total Impervious area			26.276	hectare"
"	Total % impervious			66.657"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    UnconPost_10yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:43:38 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          627.308 Coefficient A"
"          0.014  Constant B"
"          0.687  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          150.159  mm/hr"
"          Total depth                58.119  mm"
"          6  010hyd Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000 Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.022	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	13.195	2.402	9.059	minutes"
"		Time to Centroid	123.483	113.773	119.762	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	52.31	17.44	69.74	c.m"
"		Rainfall losses	28.015	2.014	21.515	mm"
"		Runoff depth	30.104	56.105	36.604	mm"
"		Runoff volume	27.09	16.83	43.93	c.m"
"		Runoff coefficient	0.518	0.965	0.630	"
"		Maximum flow	0.017	0.011	0.022	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.022	0.022	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.198	0.022	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.525	0.278	1.424	minutes"
"		Time to Centroid	107.285	110.607	107.552	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	309.19	16.27	325.47	c.m"
"		Rainfall losses	28.307	8.539	27.318	mm"
"		Runoff depth	29.812	49.580	30.801	mm"

"	Runoff volume	158.60	13.88	172.48	c.m"
"	Runoff coefficient	0.513	0.853	0.530	"
"	Maximum flow	0.188	0.010	0.198	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.198	0.216	0.000	0.000"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	10.093	0.216	0.000	0.000 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	13.212	2.405	3.683	minutes"
"	Time to Centroid	123.506	113.777	114.928	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"
"	Rainfall volume	0.3667	1.4669	1.8337	ha-m"
"	Rainfall losses	28.011	2.016	7.215	mm"
"	Runoff depth	30.108	56.104	50.905	mm"
"	Runoff volume	0.1900	1.4161	1.6060	ha-m"
"	Runoff coefficient	0.518	0.965	0.876	"
"	Maximum flow	1.177	9.630	10.093	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	10.093	10.309	0.000	0.000"	
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	2000	Catchment 2000"			
"	15.000	% Impervious"			
"	2.020	Total Area"			
"	40.000	Flow length"			
"	2.000	Overland Slope"			
"	1.717	Pervious Area"			
"	40.000	Pervious length"			
"	2.000	Pervious slope"			
"	0.303	Impervious Area"			
"	40.000	Impervious length"			
"	2.000	Impervious slope"			
"	0.250	Pervious Manning 'n' "			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n' "			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.383 10.309 0.000 0.000 c.m/sec"			
"		Catchment 2000 Pervious Impervious Total Area "			
"		Surface Area 1.717 0.303 2.020 hectare"			
"		Time of concentration 12.310 2.241 9.821 minutes"			
"		Time to Centroid 122.260 113.547 120.106 minutes"			
"		Rainfall depth 58.119 58.119 58.119 mm"			
"		Rainfall volume 997.91 176.10 1174.01 c.m"			
"		Rainfall losses 27.960 1.991 24.064 mm"			
"		Runoff depth 30.159 56.128 34.055 mm"			
"		Runoff volume 517.84 170.07 687.90 c.m"			
"		Runoff coefficient 0.519 0.966 0.586 "			
"		Maximum flow 0.323 0.116 0.383 c.m/sec"			
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.383 10.560 0.000 0.000"			
" 33		CATCHMENT 4000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	4000	Catchment 4000"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			

"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.455	10.560	0.000	0.000 c.m/sec"	
"		Catchment 4000	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	21.072	3.835	21.072	minutes"
"		Time to Centroid	134.304	116.233	134.304	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	1935.36	0.00	1935.37	c.m"
"		Rainfall losses	27.871	2.469	27.871	mm"
"		Runoff depth	30.248	55.650	30.248	mm"
"		Runoff volume	1007.27	0.00	1007.27	c.m"
"		Runoff coefficient	0.520	0.000	0.520	"
"		Maximum flow	0.455	0.000	0.455	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.455	10.674	0.000	0.000"	
" 33		CATCHMENT 3000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	3000	Catchment 3000"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"			
"		0.424	10.674	0.000	0.000 c.m/sec"
"		Catchment 3000	Pervious	Impervious	Total Area "
"		Surface Area	0.675	0.675	1.350 hectare"
"		Time of concentration	4.437	0.808	2.102 minutes"
"		Time to Centroid	111.465	111.382	111.412 minutes"
"		Rainfall depth	58.119	58.119	58.119 mm"
"		Rainfall volume	392.30	392.30	784.61 c.m"
"		Rainfall losses	28.095	3.951	16.023 mm"
"		Runoff depth	30.025	54.169	42.097 mm"
"		Runoff volume	202.67	365.64	568.30 c.m"
"		Runoff coefficient	0.517	0.932	0.724 "
"		Maximum flow	0.180	0.250	0.424 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.424	11.098	0.000	0.000"
" 33		CATCHMENT 7000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	7000	Catchment 7000"			
"	0.000	% Impervious"			
"	0.490	Total Area"			
"	7.500	Flow length"			
"	33.000	Overland Slope"			
"	0.490	Pervious Area"			
"	7.500	Pervious length"			
"	33.000	Pervious slope"			
"	0.000	Impervious Area"			
"	7.500	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.169	11.098	0.000	0.000 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	1.945	0.354	1.945 minutes"
"		Time to Centroid	107.865	111.139	107.865 minutes"
"		Rainfall depth	58.119	58.119	58.119 mm"
"		Rainfall volume	284.78	0.00	284.78 c.m"
"		Rainfall losses	28.159	7.499	28.159 mm"
"		Runoff depth	29.960	50.620	29.960 mm"

"	Runoff volume	146.80	0.00	146.81	c.m"
"	Runoff coefficient	0.515	0.000	0.515	"
"	Maximum flow	0.169	0.000	0.169	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.169	11.267	0.000	0.000"	
" 38	START/RE-START TOTALS 7000"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			39.420	hectare"
"	Total Impervious area			26.276	hectare"
"	Total % impervious			66.657"	
" 19	EXIT"				


```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    UnconPost_25yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:41:28 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          746.059 Coefficient A"
"          0.085  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          175.653  mm/hr"
"          Total depth                67.239  mm"
"          6  025hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000 Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.029	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	12.358	2.256	8.731	minutes"
"		Time to Centroid	124.313	113.098	120.286	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	60.51	20.17	80.69	c.m"
"		Rainfall losses	28.460	2.063	21.861	mm"
"		Runoff depth	38.779	65.175	45.378	mm"
"		Runoff volume	34.90	19.55	54.45	c.m"
"		Runoff coefficient	0.577	0.969	0.675	"
"		Maximum flow	0.021	0.013	0.029	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.029	0.029	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.242	0.029	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.428	0.261	1.342	minutes"
"		Time to Centroid	108.971	109.975	109.045	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	357.71	18.83	376.54	c.m"
"		Rainfall losses	29.074	9.934	28.117	mm"
"		Runoff depth	38.165	57.305	39.122	mm"

"	Runoff volume	203.04	16.05	219.08	c.m"
"	Runoff coefficient	0.568	0.852	0.582	"
"	Maximum flow	0.230	0.012	0.242	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.242	0.265	0.000	0.000"
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		12.028	0.265	0.000	0.000 c.m/sec"
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	12.373	2.259	3.568	minutes"
"	Time to Centroid	124.335	113.103	114.557	minutes"
"	Rainfall depth	67.239	67.239	67.239	mm"
"	Rainfall volume	0.4243	1.6971	2.1214	ha-m"
"	Rainfall losses	28.462	2.063	7.343	mm"
"	Runoff depth	38.777	65.175	59.896	mm"
"	Runoff volume	0.2447	1.6450	1.8897	ha-m"
"	Runoff coefficient	0.577	0.969	0.891	"
"	Maximum flow	1.497	11.312	12.028	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		12.028	12.293	0.000	0.000"
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	2000	Catchment 2000"			
"	15.000	% Impervious"			
"	2.020	Total Area"			
"	40.000	Flow length"			
"	2.000	Overland Slope"			
"	1.717	Pervious Area"			
"	40.000	Pervious length"			
"	2.000	Pervious slope"			
"	0.303	Impervious Area"			
"	40.000	Impervious length"			
"	2.000	Impervious slope"			
"	0.250	Pervious Manning 'n' "			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n' "			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.509 12.293 0.000 0.000 c.m/sec"			
"		Catchment 2000 Pervious Impervious Total Area "			
"		Surface Area 1.717 0.303 2.020 hectare"			
"		Time of concentration 11.529 2.104 9.376 minutes"			
"		Time to Centroid 123.146 112.845 120.792 minutes"			
"		Rainfall depth 67.239 67.239 67.239 mm"			
"		Rainfall volume 1154.49 203.73 1358.23 c.m"			
"		Rainfall losses 28.447 2.145 24.501 mm"			
"		Runoff depth 38.792 65.094 42.738 mm"			
"		Runoff volume 666.06 197.23 863.30 c.m"			
"		Runoff coefficient 0.577 0.968 0.636 "			
"		Maximum flow 0.434 0.136 0.509 c.m/sec"			
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.509 12.650 0.000 0.000"			
" 33		CATCHMENT 4000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	4000	Catchment 4000"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			

"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.607	12.650	0.000	0.000 c.m/sec"	
"		Catchment 4000	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	19.735	3.602	19.735	minutes"
"		Time to Centroid	134.608	115.439	134.608	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	2239.05	0.00	2239.05	c.m"
"		Rainfall losses	28.441	2.959	28.441	mm"
"		Runoff depth	38.798	64.280	38.798	mm"
"		Runoff volume	1291.96	0.00	1291.97	c.m"
"		Runoff coefficient	0.577	0.000	0.577	"
"		Maximum flow	0.607	0.000	0.607	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.607	12.832	0.000	0.000"	
" 33		CATCHMENT 3000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	3000	Catchment 3000"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"	0.525	12.832	0.000	0.000	c.m/sec"	
"	Catchment 3000	Pervious	Impervious	Total Area	"	
"	Surface Area	0.675	0.675	1.350	hectare"	
"	Time of concentration	4.156	0.759	2.050	minutes"	
"	Time to Centroid	112.936	110.977	111.722	minutes"	
"	Rainfall depth	67.239	67.239	67.239	mm"	
"	Rainfall volume	453.86	453.86	907.72	c.m"	
"	Rainfall losses	28.833	4.588	16.711	mm"	
"	Runoff depth	38.406	62.651	50.528	mm"	
"	Runoff volume	259.24	422.89	682.13	c.m"	
"	Runoff coefficient	0.571	0.932	0.751	"	
"	Maximum flow	0.234	0.291	0.525	c.m/sec"	
" 40	HYDROGRAPH Add Runoff "					
"	4	Add Runoff "				
"	0.525	13.356	0.000	0.000"		
" 33	CATCHMENT 7000"					
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	7000	Catchment 7000"				
"	0.000	% Impervious"				
"	0.490	Total Area"				
"	7.500	Flow length"				
"	33.000	Overland Slope"				
"	0.490	Pervious Area"				
"	7.500	Pervious length"				
"	33.000	Pervious slope"				
"	0.000	Impervious Area"				
"	7.500	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"	0.210	13.356	0.000	0.000	c.m/sec"	
"	Catchment 7000	Pervious	Impervious	Total Area	"	
"	Surface Area	0.490	0.000	0.490	hectare"	
"	Time of concentration	1.821	0.332	1.821	minutes"	
"	Time to Centroid	109.483	110.512	109.483	minutes"	
"	Rainfall depth	67.239	67.239	67.239	mm"	
"	Rainfall volume	329.47	0.00	329.47	c.m"	
"	Rainfall losses	28.721	8.742	28.721	mm"	
"	Runoff depth	38.518	58.496	38.518	mm"	

"	Runoff volume	188.74	0.00	188.74	c.m"
"	Runoff coefficient	0.573	0.000	0.573	"
"	Maximum flow	0.210	0.000	0.210	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.210 13.566	0.000	0.000"		
" 38	START/RE-START TOTALS 7000"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		26.276	hectare"	
"	Total % impervious		66.657"		
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    UnconPost_50yr.out"
"          Licensee name:                     "
"          Company                           "
"          Date & Time last used:              2/5/2025 at 2:45:24 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          820.361 Coefficient A"
"          0.010  Constant B"
"          0.691  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          194.803  mm/hr"
"          Total depth                74.358  mm"
"          6  050hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```


"	1.500	Impervious Depression storage"				
"		0.034	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	11.839	2.164	8.495	minutes"
"		Time to Centroid	125.251	112.774	120.938	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	66.92	22.31	89.23	c.m"
"		Rainfall losses	28.786	2.145	22.126	mm"
"		Runoff depth	45.572	72.213	52.232	mm"
"		Runoff volume	41.01	21.66	62.68	c.m"
"		Runoff coefficient	0.613	0.971	0.702	"
"		Maximum flow	0.025	0.015	0.034	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.034	0.034	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.272	0.034	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.368	0.250	1.290	minutes"
"		Time to Centroid	110.205	109.690	110.169	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	395.58	20.82	416.40	c.m"
"		Rainfall losses	29.637	11.032	28.707	mm"
"		Runoff depth	44.721	63.326	45.651	mm"

"	Runoff volume	237.91	17.73	255.65	c.m"
"	Runoff coefficient	0.601	0.852	0.614	"
"	Maximum flow	0.259	0.013	0.272	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.272	0.300	0.000	0.000"
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		13.467	0.300	0.000	0.000 c.m/sec"
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	11.854	2.167	3.487	minutes"
"	Time to Centroid	125.272	112.780	114.482	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"
"	Rainfall volume	0.4692	1.8768	2.3460	ha-m"
"	Rainfall losses	28.785	2.143	7.472	mm"
"	Runoff depth	45.573	72.214	66.886	mm"
"	Runoff volume	0.2876	1.8227	2.1103	ha-m"
"	Runoff coefficient	0.613	0.971	0.900	"
"	Maximum flow	1.779	12.562	13.467	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		13.467	13.767	0.000	0.000"
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	2000	Catchment 2000"			
"	15.000	% Impervious"			
"	2.020	Total Area"			
"	40.000	Flow length"			
"	2.000	Overland Slope"			
"	1.717	Pervious Area"			
"	40.000	Pervious length"			
"	2.000	Pervious slope"			
"	0.303	Impervious Area"			
"	40.000	Impervious length"			
"	2.000	Impervious slope"			
"	0.250	Pervious Manning 'n' "			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n' "			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.595 13.767 0.000 0.000 c.m/sec"			
"		Catchment 2000 Pervious Impervious Total Area "			
"		Surface Area 1.717 0.303 2.020 hectare"			
"		Time of concentration 11.045 2.019 9.073 minutes"			
"		Time to Centroid 124.131 112.509 121.592 minutes"			
"		Rainfall depth 74.358 74.358 74.358 mm"			
"		Rainfall volume 1276.72 225.30 1502.03 c.m"			
"		Rainfall losses 28.840 2.269 24.855 mm"			
"		Runoff depth 45.518 72.088 49.503 mm"			
"		Runoff volume 781.54 218.43 999.97 c.m"			
"		Runoff coefficient 0.612 0.969 0.666 "			
"		Maximum flow 0.514 0.151 0.595 c.m/sec"			
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.595 14.194 0.000 0.000"			
" 33		CATCHMENT 4000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	4000	Catchment 4000"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			
"	3.330	Pervious Area"			
"	120.000	Pervious length"			
"	3.000	Pervious slope"			
"	0.000	Impervious Area"			
"	120.000	Impervious length"			

"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.720	14.194	0.000	0.000 c.m/sec"	
"		Catchment 4000	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	18.906	3.456	18.906	minutes"
"		Time to Centroid	135.377	115.016	135.377	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	2476.11	0.00	2476.11	c.m"
"		Rainfall losses	28.813	3.112	28.813	mm"
"		Runoff depth	45.544	71.246	45.544	mm"
"		Runoff volume	1516.63	0.00	1516.63	c.m"
"		Runoff coefficient	0.613	0.000	0.613	"
"		Maximum flow	0.720	0.000	0.720	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.720	14.422	0.000	0.000"	
" 33		CATCHMENT 3000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	3000	Catchment 3000"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"		0.597	14.422	0.000	0.000 c.m/sec"	
"		Catchment 3000	Pervious	Impervious	Total Area	"
"		Surface Area	0.675	0.675	1.350	hectare"
"		Time of concentration	3.981	0.728	2.007	minutes"
"		Time to Centroid	114.123	110.827	112.123	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	501.92	501.92	1003.83	c.m"
"		Rainfall losses	29.474	5.085	17.279	mm"
"		Runoff depth	44.884	69.273	57.079	mm"
"		Runoff volume	302.97	467.59	770.56	c.m"
"		Runoff coefficient	0.604	0.932	0.768	"
"		Maximum flow	0.276	0.321	0.597	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.597	15.020	0.000	0.000"	
" 33		CATCHMENT 7000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	7000	Catchment 7000"				
"	0.000	% Impervious"				
"	0.490	Total Area"				
"	7.500	Flow length"				
"	33.000	Overland Slope"				
"	0.490	Pervious Area"				
"	7.500	Pervious length"				
"	33.000	Pervious slope"				
"	0.000	Impervious Area"				
"	7.500	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.239	15.020	0.000	0.000 c.m/sec"	
"		Catchment 7000	Pervious	Impervious	Total Area	"
"		Surface Area	0.490	0.000	0.490	hectare"
"		Time of concentration	1.745	0.319	1.745	minutes"
"		Time to Centroid	110.683	110.237	110.683	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	364.35	0.00	364.35	c.m"
"		Rainfall losses	29.149	9.736	29.149	mm"
"		Runoff depth	45.208	64.622	45.208	mm"

"	Runoff volume	221.52	0.00	221.52	c.m"
"	Runoff coefficient	0.608	0.000	0.608	"
"	Maximum flow	0.239	0.000	0.239	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.239 15.259	0.000	0.000"		
" 38	START/RE-START TOTALS 7000"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		26.276	hectare"	
"	Total % impervious		66.657"		
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    UnconPost_100yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 2:46:55 PM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          901.088 Coefficient A"
"          0.043  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          212.928  mm/hr"
"          Total depth                81.221  mm"
"          6  100hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.039	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	11.412	2.089	8.285	minutes"
"		Time to Centroid	125.480	112.461	121.112	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	73.10	24.37	97.47	c.m"
"		Rainfall losses	29.094	2.284	22.391	mm"
"		Runoff depth	52.127	78.937	58.829	mm"
"		Runoff volume	46.91	23.68	70.60	c.m"
"		Runoff coefficient	0.642	0.972	0.724	"
"		Maximum flow	0.030	0.016	0.039	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.039	0.039	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.296	0.039	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.319	0.241	1.247	minutes"
"		Time to Centroid	110.907	109.390	110.806	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	432.10	22.74	454.84	c.m"
"		Rainfall losses	30.156	12.072	29.252	mm"
"		Runoff depth	51.065	69.149	51.969	mm"

"	Runoff volume	271.67	19.36	291.03	c.m"
"	Runoff coefficient	0.629	0.851	0.640	"
"	Maximum flow	0.282	0.014	0.296	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.296	0.328	0.000	0.000"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	14.844	0.328	0.000	0.000 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	11.426	2.091	3.414	minutes"
"	Time to Centroid	125.499	112.466	114.313	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"
"	Rainfall volume	0.5125	2.0500	2.5625	ha-m"
"	Rainfall losses	29.091	2.281	7.643	mm"
"	Runoff depth	52.130	78.940	73.578	mm"
"	Runoff volume	0.3289	1.9924	2.3214	ha-m"
"	Runoff coefficient	0.642	0.972	0.906	"
"	Maximum flow	2.075	13.744	14.844	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	14.844	15.173	0.000	0.000"	
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				

"	2000	Catchment 2000"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.686 15.173 0.000 0.000 c.m/sec"				
"		Catchment 2000 Pervious Impervious Total Area "				
"		Surface Area 1.717 0.303 2.020 hectare"				
"		Time of concentration 10.647 1.949 8.813 minutes"				
"		Time to Centroid 124.365 112.180 121.796 minutes"				
"		Rainfall depth 81.221 81.221 81.221 mm"				
"		Rainfall volume 1394.56 246.10 1640.66 c.m"				
"		Rainfall losses 29.139 2.392 25.127 mm"				
"		Runoff depth 52.082 78.828 56.094 mm"				
"		Runoff volume 894.25 238.85 1133.10 c.m"				
"		Runoff coefficient 0.641 0.971 0.691 "				
"		Maximum flow 0.598 0.165 0.686 c.m/sec"				
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.686 15.670 0.000 0.000"				
" 33		CATCHMENT 4000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	4000	Catchment 4000"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				
"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				

"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.835	15.670	0.000	0.000 c.m/sec"	
"		Catchment 4000	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	18.225	3.335	18.225	minutes"
"		Time to Centroid	135.263	114.631	135.263	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	2704.65	0.00	2704.66	c.m"
"		Rainfall losses	28.982	3.311	28.982	mm"
"		Runoff depth	52.239	77.910	52.239	mm"
"		Runoff volume	1739.55	0.00	1739.55	c.m"
"		Runoff coefficient	0.643	0.000	0.643	"
"		Maximum flow	0.835	0.000	0.835	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.835	15.947	0.000	0.000"	
" 33		CATCHMENT 3000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	3000	Catchment 3000"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				

"	1.500	Impervious Depression storage"				
"	0.665	15.947	0.000	0.000	c.m/sec"	
"	Catchment 3000	Pervious	Impervious	Total Area	"	
"	Surface Area	0.675	0.675	1.350	hectare"	
"	Time of concentration	3.838	0.702	1.967	minutes"	
"	Time to Centroid	114.744	110.663	112.309	minutes"	
"	Rainfall depth	81.221	81.221	81.221	mm"	
"	Rainfall volume	548.24	548.24	1096.48	c.m"	
"	Rainfall losses	30.089	5.611	17.850	mm"	
"	Runoff depth	51.132	75.610	63.371	mm"	
"	Runoff volume	345.14	510.37	855.51	c.m"	
"	Runoff coefficient	0.630	0.931	0.780	"	
"	Maximum flow	0.315	0.350	0.665	c.m/sec"	
" 40	HYDROGRAPH Add Runoff "					
"	4	Add Runoff "				
"	0.665	16.612	0.000	0.000"		
" 33	CATCHMENT 7000"					
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	7000	Catchment 7000"				
"	0.000	% Impervious"				
"	0.490	Total Area"				
"	7.500	Flow length"				
"	33.000	Overland Slope"				
"	0.490	Pervious Area"				
"	7.500	Pervious length"				
"	33.000	Pervious slope"				
"	0.000	Impervious Area"				
"	7.500	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"	0.261	16.612	0.000	0.000	c.m/sec"	
"	Catchment 7000	Pervious	Impervious	Total Area	"	
"	Surface Area	0.490	0.000	0.490	hectare"	
"	Time of concentration	1.682	0.308	1.682	minutes"	
"	Time to Centroid	111.370	109.953	111.370	minutes"	
"	Rainfall depth	81.221	81.221	81.221	mm"	
"	Rainfall volume	397.98	0.00	397.98	c.m"	
"	Rainfall losses	29.624	10.720	29.624	mm"	
"	Runoff depth	51.597	70.501	51.597	mm"	

"	Runoff volume	252.82	0.00	252.83	c.m"
"	Runoff coefficient	0.635	0.000	0.635	"
"	Maximum flow	0.261	0.000	0.261	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.261 16.873	0.000	0.000"		
" 38	START/RE-START TOTALS 7000"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area		39.420	hectare"	
"	Total Impervious area		26.276	hectare"	
"	Total % impervious		66.657"		
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    UnconPost_REG.out"
"          Licensee name:                     "
"          Company                             "
"          Date & Time last used:              2/5/2025 at 2:48:58 PM"
" 31      TIME PARAMETERS"
"          60.000  Time Step"
"          2880.000 Max. Storm length"
"          7500.000 Max. Hydrograph"
" 32      STORM Historic"
"          5      Historic"
"          2880.000 Duration"
"          48.000  Rainfall intensity values"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.026      2.026      2.026      2.028"
"                  2.026      6.000      4.000      6.000      13.000"
"                  17.000      13.000      23.000      13.000      13.000"
"                  53.000      38.000      13.000"
"          Maximum intensity                    53.000      mm/hr"
"          Total depth                          285.000      mm"
"          6 000hyd Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1 Triangular SCS"
"          1 Equal length"
"          2 Horton equation"
"          5000 Catchment 5000"
"          25.000 % Impervious"
"          0.120 Total Area"
"          55.000 Flow length"
"          3.000 Overland Slope"
"          0.090 Pervious Area"
"          55.000 Pervious length"
"          3.000 Pervious slope"
"          0.030 Impervious Area"
"          55.000 Impervious length"
"          3.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000 Pervious Min.infiltration"

```

"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.013	0.000	0.000	0.000 c.m/sec"
"		Catchment 5000	Pervious	Impervious	Total Area "
"		Surface Area	0.090	0.030	0.120 hectare"
"		Time of concentration	20.500	3.643	14.414 minutes"
"		Time to Centroid	2725.538	2237.026	2549.173 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	256.50	85.50	342.00 c.m"
"		Rainfall losses	139.608	38.558	114.346 mm"
"		Runoff depth	145.392	246.442	170.654 mm"
"		Runoff volume	130.85	73.93	204.79 c.m"
"		Runoff coefficient	0.510	0.865	0.599 "
"		Maximum flow	0.009	0.004	0.013 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.013	0.013	0.000	0.000"
" 33		CATCHMENT 6000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	6000	Catchment 6000"			
"	5.000	% Impervious"			
"	0.560	Total Area"			
"	5.000	Flow length"			
"	33.000	Overland Slope"			
"	0.532	Pervious Area"			
"	5.000	Pervious length"			
"	33.000	Pervious slope"			
"	0.028	Impervious Area"			
"	5.000	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.065	0.013	0.000	0.000 c.m/sec"
"		Catchment 6000	Pervious	Impervious	Total Area "
"		Surface Area	0.532	0.028	0.560 hectare"

"	Time of concentration	2.369	0.421	2.184	minutes"
"	Time to Centroid	2699.991	2271.479	2659.445	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	1516.20	79.80	1596.00	c.m"
"	Rainfall losses	157.980	32.780	151.720	mm"
"	Runoff depth	127.020	252.220	133.280	mm"
"	Runoff volume	675.75	70.62	746.37	c.m"
"	Runoff coefficient	0.446	0.885	0.468	"
"	Maximum flow	0.062	0.004	0.065	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.065 0.078 0.000 0.000"				
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.010 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	3.800 0.078 0.000 0.000 c.m/sec"				
"	Catchment 1000 Pervious Impervious Total Area "				
"	Surface Area 6.310 25.240 31.550 hectare"				
"	Time of concentration 20.526 3.647 5.817 minutes"				
"	Time to Centroid 2725.564 2236.987 2299.778 minutes"				
"	Rainfall depth 285.000 285.000 285.000 mm"				
"	Rainfall volume 1.7983 7.1934 8.9917 ha-m"				
"	Rainfall losses 139.615 38.537 58.753 mm"				
"	Runoff depth 145.385 246.463 226.247 mm"				
"	Runoff volume 0.9174 6.2207 7.1381 ha-m"				
"	Runoff coefficient 0.510 0.865 0.794 "				
"	Maximum flow 0.644 3.182 3.800 c.m/sec"				
" 40	HYDROGRAPH Add Runoff "				

"	4	Add Runoff "				
"		3.800	3.878	0.000	0.000"	
" 33		CATCHMENT 2000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	2000	Catchment 2000"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.010	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.210	3.878	0.000	0.000 c.m/sec"	
"		Catchment 2000	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	19.125	3.398	15.514	minutes"
"		Time to Centroid	2724.073	2240.650	2613.063	minutes"
"		Rainfall depth	285.000	285.000	285.000	mm"
"		Rainfall volume	4893.45	863.55	5757.00	c.m"
"		Rainfall losses	139.363	39.000	124.309	mm"
"		Runoff depth	145.637	246.000	160.691	mm"
"		Runoff volume	2500.58	745.38	3245.96	c.m"
"		Runoff coefficient	0.511	0.863	0.564	"
"		Maximum flow	0.173	0.038	0.210	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.210	4.087	0.000	0.000"	
" 33		CATCHMENT 4000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	4000	Catchment 4000"				
"	0.000	% Impervious"				
"	3.330	Total Area"				
"	120.000	Flow length"				

"	3.000	Overland Slope"				
"	3.330	Pervious Area"				
"	120.000	Pervious length"				
"	3.000	Pervious slope"				
"	0.000	Impervious Area"				
"	120.000	Impervious length"				
"	3.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.010	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.366	4.087	0.000	0.000 c.m/sec"	
"		Catchment 4000	Pervious	Impervious	Total Area	"
"		Surface Area	3.330	0.000	3.330	hectare"
"		Time of concentration	32.738	5.817	32.738	minutes"
"		Time to Centroid	2737.685	2233.111	2737.684	minutes"
"		Rainfall depth	285.000	285.000	285.000	mm"
"		Rainfall volume	9490.49	0.01	9490.50	c.m"
"		Rainfall losses	139.700	29.327	139.699	mm"
"		Runoff depth	145.300	255.673	145.301	mm"
"		Runoff volume	4838.50	0.01	4838.51	c.m"
"		Runoff coefficient	0.510	0.000	0.510	"
"		Maximum flow	0.366	0.000	0.366	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.366	4.373	0.000	0.000"	
" 33		CATCHMENT 3000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	3000	Catchment 3000"				
"	50.000	% Impervious"				
"	1.350	Total Area"				
"	20.000	Flow length"				
"	15.000	Overland Slope"				
"	0.675	Pervious Area"				
"	20.000	Pervious length"				
"	15.000	Pervious slope"				
"	0.675	Impervious Area"				
"	20.000	Impervious length"				
"	15.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				

"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.165	4.373	0.000	0.000 c.m/sec"
"		Catchment 3000	Pervious	Impervious	Total Area "
"		Surface Area	0.675	0.675	1.350 hectare"
"		Time of concentration	6.894	1.225	3.197 minutes"
"		Time to Centroid	2702.037	2279.380	2426.416 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	1923.75	1923.75	3847.50 c.m"
"		Rainfall losses	153.479	38.462	95.970 mm"
"		Runoff depth	131.521	246.538	189.030 mm"
"		Runoff volume	887.77	1664.13	2551.90 c.m"
"		Runoff coefficient	0.461	0.865	0.663 "
"		Maximum flow	0.077	0.088	0.165 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.165	4.538	0.000	0.000"
" 33		CATCHMENT 7000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	7000	Catchment 7000"			
"	0.000	% Impervious"			
"	0.490	Total Area"			
"	7.500	Flow length"			
"	33.000	Overland Slope"			
"	0.490	Pervious Area"			
"	7.500	Pervious length"			
"	33.000	Pervious slope"			
"	0.000	Impervious Area"			
"	7.500	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.056	4.538	0.000	0.000 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"

"	Time of concentration	3.021	0.537	3.021	minutes"
"	Time to Centroid	2699.929	2272.615	2699.928	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	1396.50	0.00	1396.50	c.m"
"	Rainfall losses	159.495	33.595	159.495	mm"
"	Runoff depth	125.505	251.405	125.505	mm"
"	Runoff volume	614.98	0.00	614.98	c.m"
"	Runoff coefficient	0.440	0.000	0.440	"
"	Maximum flow	0.056	0.000	0.056	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.056	4.594	0.000	0.000"
" 38	START/RE-START TOTALS 7000"				
"	3 Runoff Totals on EXIT"				
"	Total Catchment area			39.420	hectare"
"	Total Impervious area			26.276	hectare"
"	Total % impervious			66.657"	
" 19	EXIT"				

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Post_25mm.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/5/2025 at 10:32:39 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          367.000  Coefficient A"
"          5.000  Constant B"
"          0.700  Exponent C"
"          0.394  Fraction R"
"          120.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          72.993  mm/hr"
"          Total depth          24.995  mm"
"          7  0025hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000  % Impervious"
"          0.120  Total Area"
"          55.000  Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000  Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000  Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.005	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	26.581	3.205	13.523	minutes"
"		Time to Centroid	88.923	64.163	75.092	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	22.50	7.50	29.99	c.m"
"		Rainfall losses	18.914	1.906	14.662	mm"
"		Runoff depth	6.081	23.090	10.333	mm"
"		Runoff volume	5.47	6.93	12.40	c.m"
"		Runoff coefficient	0.243	0.924	0.413	"
"		Maximum flow	0.002	0.004	0.005	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.005	0.005	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.032	0.005	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	3.071	0.370	2.655	minutes"
"		Time to Centroid	63.738	60.371	63.219	minutes"
"		Rainfall depth	24.995	24.995	24.995	mm"
"		Rainfall volume	132.98	7.00	139.97	c.m"
"		Rainfall losses	19.084	4.536	18.356	mm"
"		Runoff depth	5.912	20.459	6.639	mm"

"	Runoff volume	31.45	5.73	37.18	c.m"
"	Runoff coefficient	0.237	0.819	0.266	"
"	Maximum flow	0.030	0.005	0.032	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.032	0.037	0.000	0.000"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.032	0.037	0.037	0.000"	
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.037		c.m/sec"	
"	Hydrograph volume	49.578		c.m"	
"	0.032	0.037	0.037	0.037"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.032	0.000	0.037	0.037"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	3.692	0.000	0.037	0.037 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	26.613	3.209	4.655	minutes"
"	Time to Centroid	88.960	64.168	65.700	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"

"	Rainfall volume	1577.21	6308.82	7886.03	c.m"
"	Rainfall losses	18.914	1.906	5.307	mm"
"	Runoff depth	6.082	23.089	19.688	mm"
"	Runoff volume	383.76	5827.78	6211.54	c.m"
"	Runoff coefficient	0.243	0.924	0.788	"
"	Maximum flow	0.150	3.664	3.692	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		3.692	3.692	0.037	0.037"
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	2000 Catchment 2000"				
"	15.000 % Impervious"				
"	2.020 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	1.717 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	0.303 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n' "				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n' "				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.056	3.692	0.037	0.037 c.m/sec"
"	Catchment 2000	Pervious	Impervious	Total Area	"
"	Surface Area	1.717	0.303	2.020	hectare"
"	Time of concentration	24.798	2.990	16.045	minutes"
"	Time to Centroid	87.039	63.901	77.753	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	429.17	75.74	504.91	c.m"
"	Rainfall losses	18.913	1.889	16.360	mm"
"	Runoff depth	6.082	23.106	8.636	mm"
"	Runoff volume	104.43	70.01	174.44	c.m"
"	Runoff coefficient	0.243	0.924	0.345	"
"	Maximum flow	0.045	0.045	0.056	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.056	3.744	0.037	0.037"
" 54	POND DESIGN"				

"	3.744	Current peak flow	c.m/sec"
"	3.341	Target outflow	c.m/sec"
"	6386.0	Hydrograph volume	c.m"
"	18.	Number of stages"	
"	421.500	Minimum water level	metre"
"	423.200	Maximum water level	metre"
"	421.500	Starting water level	metre"
"	0	Keep Design Data: 1 = True; 0 = False"	
"		Level Discharge	Volume"
"	421.500	0.000	0.000"
"	421.600	0.00700	1070.100"
"	421.700	0.01300	2176.600"
"	421.800	0.01900	3319.800"
"	421.900	0.02300	4500.000"
"	422.000	0.02600	5717.200"
"	422.100	0.07100	6977.200"
"	422.200	0.1940	8275.500"
"	422.300	0.3520	9602.300"
"	422.400	0.3950	10957.80"
"	422.500	0.5140	12342.10"
"	422.600	0.7980	13755.30"
"	422.700	0.9580	15197.70"
"	422.800	1.614	16669.40"
"	422.900	2.846	18170.60"
"	423.000	4.482	19701.40"
"	423.100	6.460	21262.00"
"	423.200	8.746	22852.50"
"		Peak outflow	0.043 c.m/sec"
"		Maximum level	422.039 metre"
"		Maximum storage	6204.953 c.m"
"		Centroidal lag	43.456 hours"
"	0.056	3.744	0.043 0.037 c.m/sec"
" 40		HYDROGRAPH Next link "	
"	5	Next link "	
"	0.056	0.043	0.043 0.037"
" 33		CATCHMENT 4000"	
"	1	Triangular SCS"	
"	1	Equal length"	
"	2	Horton equation"	
"	4000	Catchment 4000"	
"	0.000	% Impervious"	
"	3.330	Total Area"	
"	120.000	Flow length"	
"	3.000	Overland Slope"	
"	3.330	Pervious Area"	
"	120.000	Pervious length"	
"	3.000	Pervious slope"	
"	0.000	Impervious Area"	
"	120.000	Impervious length"	
"	3.000	Impervious slope"	

"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.056	0.043	0.043	0.037 c.m/sec"
"		Catchment 4000	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	42.448	5.118	42.448 minutes"
"		Time to Centroid	105.920	66.672	105.919 minutes"
"		Rainfall depth	24.995	24.995	24.995 mm"
"		Rainfall volume	832.34	0.00	832.34 c.m"
"		Rainfall losses	18.910	1.665	18.910 mm"
"		Runoff depth	6.085	23.330	6.085 mm"
"		Runoff volume	202.64	0.00	202.64 c.m"
"		Runoff coefficient	0.243	0.000	0.243 "
"		Maximum flow	0.056	0.000	0.056 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.056	0.080	0.043	0.037"
" 33		CATCHMENT 3000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	3000	Catchment 3000"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			

	0.121	0.080	0.043	0.037 c.m/sec"	
"	Catchment 3000	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	8.939	1.078	2.724	minutes"
"	Time to Centroid	70.037	61.193	63.045	minutes"
"	Rainfall depth	24.995	24.995	24.995	mm"
"	Rainfall volume	168.72	168.72	337.44	c.m"
"	Rainfall losses	18.924	2.080	10.502	mm"
"	Runoff depth	6.071	22.916	14.493	mm"
"	Runoff volume	40.98	154.68	195.66	c.m"
"	Runoff coefficient	0.243	0.917	0.580	"
"	Maximum flow	0.031	0.118	0.121	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4	Add Runoff "			
"	0.121	0.132	0.043	0.037"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8	Copy to Outflow"			
"	0.121	0.132	0.132	0.037"	
" 40	HYDROGRAPH Combine 200"				
"	6	Combine "			
"	200	Node #"			
"	To Northeast Wetland"				
"	Maximum flow	0.132	c.m/sec"		
"	Hydrograph volume	3284.512	c.m"		
"	0.121	0.132	0.132	0.132"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2	Start - New Tributary"			
"	0.121	0.000	0.132	0.132"	
" 33	CATCHMENT 7000"				
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	7000	Catchment 7000"			
"	0.000	% Impervious"			
"	0.490	Total Area"			
"	7.500	Flow length"			
"	33.000	Overland Slope"			
"	0.490	Pervious Area"			
"	7.500	Pervious length"			
"	33.000	Pervious slope"			
"	0.000	Impervious Area"			
"	7.500	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			

"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.025	0.000	0.132	0.132 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	3.917	0.472	3.917 minutes"
"		Time to Centroid	64.675	60.746	64.675 minutes"
"		Rainfall depth	24.995	24.995	24.995 mm"
"		Rainfall volume	122.48	0.00	122.48 c.m"
"		Rainfall losses	19.020	3.993	19.020 mm"
"		Runoff depth	5.975	21.002	5.975 mm"
"		Runoff volume	29.28	0.00	29.28 c.m"
"		Runoff coefficient	0.239	0.000	"
"		Maximum flow	0.025	0.000	0.025 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.025	0.025	0.132	0.132"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.025	0.025	0.025	0.132"
" 40		HYDROGRAPH Combine 300"			
"	6	Combine "			
"	300	Node #"			
"		To West Farm Field"			
"		Maximum flow	0.025		c.m/sec"
"		Hydrograph volume	29.277		c.m"
"		0.025	0.025	0.025	0.025"
" 40		HYDROGRAPH Confluence 100"			
"	7	Confluence "			
"	100	Node #"			
"		To Highway 6 Roadside Ditch"			
"		Maximum flow	0.037		c.m/sec"
"		Hydrograph volume	49.578		c.m"
"		0.025	0.037	0.025	0.000"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.025	0.037	0.037	0.000"
" 40		HYDROGRAPH Combine 200"			
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	0.151		c.m/sec"
"		Hydrograph volume	3334.089		c.m"
"		0.025	0.037	0.037	0.151"
" 40		HYDROGRAPH Confluence 200"			
"	7	Confluence "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	0.151		c.m/sec"

"	Hydrograph volume	3334.089	c.m"
"	0.025 0.151 0.037	0.000"	
" 40	HYDROGRAPH Copy to Outflow"		
"	8 Copy to Outflow"		
"	0.025 0.151 0.151	0.000"	
" 40	HYDROGRAPH Combine 300"		
"	6 Combine "		
"	300 Node #"		
"	To West Farm Field"		
"	Maximum flow	0.173	c.m/sec"
"	Hydrograph volume	3363.367	c.m"
"	0.025 0.151 0.151	0.173"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	26.276	hectare"
"	Total % impervious	66.657"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\"
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Post_2yr.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/5/2025 at 10:55:18 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          414.876  Coefficient A"
"          0.027  Constant B"
"          0.682  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          100.235  mm/hr"
"          Total depth          39.504  mm"
"          6  002hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000  % Impervious"
"          0.120  Total Area"
"          55.000  Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000  Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000  Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.009	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	15.715	2.823	9.662	minutes"
"		Time to Centroid	122.763	115.748	119.469	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	35.55	11.85	47.40	c.m"
"		Rainfall losses	25.414	2.086	19.582	mm"
"		Runoff depth	14.090	37.418	19.922	mm"
"		Runoff volume	12.68	11.23	23.91	c.m"
"		Runoff coefficient	0.357	0.947	0.504	"
"		Maximum flow	0.008	0.007	0.009	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.009	0.009	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.105	0.009	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.816	0.326	1.648	minutes"
"		Time to Centroid	104.196	112.311	105.112	minutes"
"		Rainfall depth	39.504	39.504	39.504	mm"
"		Rainfall volume	210.16	11.06	221.22	c.m"
"		Rainfall losses	25.568	5.814	24.580	mm"
"		Runoff depth	13.936	33.690	14.924	mm"

"	Runoff volume	74.14	9.43	83.57	c.m"
"	Runoff coefficient	0.353	0.853	0.378	"
"	Maximum flow	0.098	0.007	0.105	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.105	0.114	0.000	0.000"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.105	0.114	0.114	0.000"	
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.114		c.m/sec"	
"	Hydrograph volume	107.478		c.m"	
"	0.105	0.114	0.114	0.114"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.105	0.000	0.114	0.114"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	6.428	0.000	0.114	0.114 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	15.735	2.827	3.937	minutes"
"	Time to Centroid	122.788	115.756	116.361	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"

"	Rainfall volume	0.2493	0.9971	1.2464	ha-m"
"	Rainfall losses	25.416	2.089	6.754	mm"
"	Runoff depth	14.088	37.415	32.750	mm"
"	Runoff volume	0.0889	0.9444	1.0333	ha-m"
"	Runoff coefficient	0.357	0.947	0.829	"
"	Maximum flow	0.554	6.308	6.428	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		6.428	6.428	0.114	0.114"
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	2000 Catchment 2000"				
"	15.000 % Impervious"				
"	2.020 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	1.717 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	0.303 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n' "				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n' "				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.170	6.428	0.114	0.114 c.m/sec"
"	Catchment 2000	Pervious	Impervious	Total Area	"
"	Surface Area	1.717	0.303	2.020	hectare"
"	Time of concentration	14.661	2.634	10.821	minutes"
"	Time to Centroid	121.346	115.356	119.434	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	678.28	119.70	797.98	c.m"
"	Rainfall losses	25.379	1.965	21.867	mm"
"	Runoff depth	14.125	37.539	17.637	mm"
"	Runoff volume	242.53	113.74	356.27	c.m"
"	Runoff coefficient	0.358	0.950	0.446	"
"	Maximum flow	0.155	0.077	0.170	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.170	6.541	0.114	0.114"
" 54	POND DESIGN"				

"	6.541	Current peak flow	c.m/sec"
"	3.341	Target outflow	c.m/sec"
"	10688.8	Hydrograph volume	c.m"
"	18.	Number of stages"	
"	421.500	Minimum water level	metre"
"	423.200	Maximum water level	metre"
"	421.500	Starting water level	metre"
"	0	Keep Design Data: 1 = True; 0 = False"	
"		Level Discharge	Volume"
"	421.500	0.000	0.000"
"	421.600	0.00700	1070.100"
"	421.700	0.01300	2176.600"
"	421.800	0.01900	3319.800"
"	421.900	0.02300	4500.000"
"	422.000	0.02600	5717.200"
"	422.100	0.07100	6977.200"
"	422.200	0.1940	8275.500"
"	422.300	0.3520	9602.300"
"	422.400	0.3950	10957.80"
"	422.500	0.5140	12342.10"
"	422.600	0.7980	13755.30"
"	422.700	0.9580	15197.70"
"	422.800	1.614	16669.40"
"	422.900	2.846	18170.60"
"	423.000	4.482	19701.40"
"	423.100	6.460	21262.00"
"	423.200	8.746	22852.50"
"		Peak outflow	0.260 c.m/sec"
"		Maximum level	422.242 metre"
"		Maximum storage	8827.479 c.m"
"		Centroidal lag	33.143 hours"
"	0.170	6.541	0.260 0.114 c.m/sec"
" 40	HYDROGRAPH Next link "		
"	5	Next link "	
"	0.170	0.260	0.260 0.114"
" 33	CATCHMENT 4000"		
"	1	Triangular SCS"	
"	1	Equal length"	
"	2	Horton equation"	
"	4000	Catchment 4000"	
"	0.000	% Impervious"	
"	3.330	Total Area"	
"	120.000	Flow length"	
"	3.000	Overland Slope"	
"	3.330	Pervious Area"	
"	120.000	Pervious length"	
"	3.000	Pervious slope"	
"	0.000	Impervious Area"	
"	120.000	Impervious length"	
"	3.000	Impervious slope"	

"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.193	0.260	0.260	0.114 c.m/sec"
"		Catchment 4000	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	25.097	4.509	25.096 minutes"
"		Time to Centroid	135.157	118.349	135.157 minutes"
"		Rainfall depth	39.504	39.504	39.504 mm"
"		Rainfall volume	1315.48	0.00	1315.48 c.m"
"		Rainfall losses	25.393	1.692	25.393 mm"
"		Runoff depth	14.111	37.813	14.111 mm"
"		Runoff volume	469.88	0.00	469.89 c.m"
"		Runoff coefficient	0.357	0.000	0.357 "
"		Maximum flow	0.193	0.000	0.193 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.193	0.269	0.260	0.114"
" 33		CATCHMENT 3000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	3000	Catchment 3000"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			

	0.228	0.269	0.260	0.114 c.m/sec"	
"	Catchment 3000	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	5.285	0.949	2.157	minutes"
"	Time to Centroid	108.893	112.435	111.449	minutes"
"	Rainfall depth	39.504	39.504	39.504	mm"
"	Rainfall volume	266.65	266.65	533.30	c.m"
"	Rainfall losses	25.407	2.971	14.189	mm"
"	Runoff depth	14.097	36.533	25.315	mm"
"	Runoff volume	95.16	246.59	341.75	c.m"
"	Runoff coefficient	0.357	0.925	0.641	"
"	Maximum flow	0.106	0.170	0.228	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4	Add Runoff "			
"	0.228	0.296	0.260	0.114"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8	Copy to Outflow"			
"	0.228	0.296	0.296	0.114"	
" 40	HYDROGRAPH Combine 200"				
"	6	Combine "			
"	200	Node #"			
"	To Northeast Wetland"				
"	Maximum flow	0.296	c.m/sec"		
"	Hydrograph volume	7320.068	c.m"		
"	0.228	0.296	0.296	0.296"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2	Start - New Tributary"			
"	0.228	0.000	0.296	0.296"	
" 33	CATCHMENT 7000"				
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	7000	Catchment 7000"			
"	0.000	% Impervious"			
"	0.490	Total Area"			
"	7.500	Flow length"			
"	33.000	Overland Slope"			
"	0.490	Pervious Area"			
"	7.500	Pervious length"			
"	33.000	Pervious slope"			
"	0.000	Impervious Area"			
"	7.500	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			

"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.082	0.000	0.296	0.296 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	2.316	0.416	2.316 minutes"
"		Time to Centroid	104.877	112.801	104.877 minutes"
"		Rainfall depth	39.504	39.504	39.504 mm"
"		Rainfall volume	193.57	0.00	193.57 c.m"
"		Rainfall losses	25.440	5.168	25.440 mm"
"		Runoff depth	14.064	34.336	14.064 mm"
"		Runoff volume	68.91	0.00	68.91 c.m"
"		Runoff coefficient	0.356	0.000	0.356 "
"		Maximum flow	0.082	0.000	0.082 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.082	0.082	0.296	0.296"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.082	0.082	0.082	0.296"
" 40		HYDROGRAPH Combine 300"			
"	6	Combine "			
"	300	Node #"			
"		To West Farm Field"			
"		Maximum flow	0.082	c.m/sec"	
"		Hydrograph volume	68.915	c.m"	
"		0.082	0.082	0.082	0.082"
" 40		HYDROGRAPH Confluence 100"			
"	7	Confluence "			
"	100	Node #"			
"		To Highway 6 Roadside Ditch"			
"		Maximum flow	0.114	c.m/sec"	
"		Hydrograph volume	107.478	c.m"	
"		0.082	0.114	0.082	0.000"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.082	0.114	0.114	0.000"
" 40		HYDROGRAPH Combine 200"			
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	0.390	c.m/sec"	
"		Hydrograph volume	7427.548	c.m"	
"		0.082	0.114	0.114	0.390"
" 40		HYDROGRAPH Confluence 200"			
"	7	Confluence "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	0.390	c.m/sec"	

"	Hydrograph volume	7427.548	c.m"
"	0.082 0.390 0.114	0.000"	
" 40	HYDROGRAPH Copy to Outflow"		
"	8 Copy to Outflow"		
"	0.082 0.390 0.390	0.000"	
" 40	HYDROGRAPH Combine 300"		
"	6 Combine "		
"	300 Node #"		
"	To West Farm Field"		
"	Maximum flow	0.473	c.m/sec"
"	Hydrograph volume	7496.462	c.m"
"	0.082 0.390 0.390	0.473"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	26.276	hectare"
"	Total % impervious	66.657"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Post_5yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 10:57:02 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          544.711 Coefficient A"
"          0.021  Constant B"
"          0.686  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          130.581  mm/hr"
"          Total depth                50.743  mm"
"          6  005hyd Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000 Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"			
"		0.016	0.000	0.000	0.000 c.m/sec"
"		Catchment 5000	Pervious	Impervious	Total Area "
"		Surface Area	0.090	0.030	0.120 hectare"
"		Time of concentration	14.001	2.540	9.329 minutes"
"		Time to Centroid	122.721	114.328	119.300 minutes"
"		Rainfall depth	50.743	50.743	50.743 mm"
"		Rainfall volume	45.67	15.22	60.89 c.m"
"		Rainfall losses	27.152	2.035	20.873 mm"
"		Runoff depth	23.590	48.708	29.870 mm"
"		Runoff volume	21.23	14.61	35.84 c.m"
"		Runoff coefficient	0.465	0.960	0.589 "
"		Maximum flow	0.013	0.010	0.016 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.016	0.016	0.000	0.000"
" 33		CATCHMENT 6000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	6000	Catchment 6000"			
"	5.000	% Impervious"			
"	0.560	Total Area"			
"	5.000	Flow length"			
"	33.000	Overland Slope"			
"	0.532	Pervious Area"			
"	5.000	Pervious length"			
"	33.000	Pervious slope"			
"	0.028	Impervious Area"			
"	5.000	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.163	0.016	0.000	0.000 c.m/sec"
"		Catchment 6000	Pervious	Impervious	Total Area "
"		Surface Area	0.532	0.028	0.560 hectare"
"		Time of concentration	1.618	0.293	1.500 minutes"
"		Time to Centroid	105.803	111.144	106.279 minutes"
"		Rainfall depth	50.743	50.743	50.743 mm"
"		Rainfall volume	269.95	14.21	284.16 c.m"
"		Rainfall losses	27.440	7.450	26.440 mm"
"		Runoff depth	23.303	43.293	24.303 mm"

"	Runoff volume	123.97	12.12	136.10	c.m"
"	Runoff coefficient	0.459	0.853	0.479	"
"	Maximum flow	0.154	0.009	0.163	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.163 0.177 0.000 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.163 0.177 0.177 0.000"				
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.177		c.m/sec"	
"	Hydrograph volume	171.938		c.m"	
"	0.163 0.177 0.177 0.177"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.163 0.000 0.177 0.177"				
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	8.626 0.000 0.177 0.177 c.m/sec"				
"	Catchment 1000 Pervious Impervious Total Area "				
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	14.018	2.543	3.782	minutes"
"	Time to Centroid	122.745	114.334	115.243	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"

"	Rainfall volume	0.3202	1.2808	1.6009	ha-m"
"	Rainfall losses	27.151	2.037	7.060	mm"
"	Runoff depth	23.592	48.706	43.683	mm"
"	Runoff volume	0.1489	1.2293	1.3782	ha-m"
"	Runoff coefficient	0.465	0.960	0.861	"
"	Maximum flow	0.936	8.331	8.626	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		8.626	8.626	0.177	0.177"
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	2000 Catchment 2000"				
"	15.000 % Impervious"				
"	2.020 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	1.717 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	0.303 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.279	8.626	0.177	0.177 c.m/sec"
"	Catchment 2000	Pervious	Impervious	Total Area	"
"	Surface Area	1.717	0.303	2.020	hectare"
"	Time of concentration	13.062	2.369	10.193	minutes"
"	Time to Centroid	121.452	114.097	119.479	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	871.26	153.75	1025.01	c.m"
"	Rainfall losses	27.259	1.941	23.461	mm"
"	Runoff depth	23.484	48.802	27.282	mm"
"	Runoff volume	403.22	147.87	551.10	c.m"
"	Runoff coefficient	0.463	0.962	0.538	"
"	Maximum flow	0.259	0.101	0.279	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.279	8.816	0.177	0.177"
" 54	POND DESIGN"				

"	8.816	Current peak flow	c.m/sec"
"	3.341	Target outflow	c.m/sec"
"	14333.0	Hydrograph volume	c.m"
"	18.	Number of stages"	
"	421.500	Minimum water level	metre"
"	423.200	Maximum water level	metre"
"	421.500	Starting water level	metre"
"	0	Keep Design Data: 1 = True; 0 = False"	
"		Level Discharge	Volume"
"	421.500	0.000	0.000"
"	421.600	0.00700	1070.100"
"	421.700	0.01300	2176.600"
"	421.800	0.01900	3319.800"
"	421.900	0.02300	4500.000"
"	422.000	0.02600	5717.200"
"	422.100	0.07100	6977.200"
"	422.200	0.1940	8275.500"
"	422.300	0.3520	9602.300"
"	422.400	0.3950	10957.80"
"	422.500	0.5140	12342.10"
"	422.600	0.7980	13755.30"
"	422.700	0.9580	15197.70"
"	422.800	1.614	16669.40"
"	422.900	2.846	18170.60"
"	423.000	4.482	19701.40"
"	423.100	6.460	21262.00"
"	423.200	8.746	22852.50"
"		Peak outflow	0.407 c.m/sec"
"		Maximum level	422.410 metre"
"		Maximum storage	11095.038 c.m"
"		Centroidal lag	26.748 hours"
"	0.279	8.816	0.407 0.177 c.m/sec"
" 40		HYDROGRAPH Next link "	
"	5	Next link "	
"	0.279	0.407	0.407 0.177"
" 33		CATCHMENT 4000"	
"	1	Triangular SCS"	
"	1	Equal length"	
"	2	Horton equation"	
"	4000	Catchment 4000"	
"	0.000	% Impervious"	
"	3.330	Total Area"	
"	120.000	Flow length"	
"	3.000	Overland Slope"	
"	3.330	Pervious Area"	
"	120.000	Pervious length"	
"	3.000	Pervious slope"	
"	0.000	Impervious Area"	
"	120.000	Impervious length"	
"	3.000	Impervious slope"	

"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.356	0.407	0.407	0.177 c.m/sec"
"		Catchment 4000	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	22.359	4.056	22.359 minutes"
"		Time to Centroid	134.036	116.866	134.036 minutes"
"		Rainfall depth	50.743	50.743	50.743 mm"
"		Rainfall volume	1689.74	0.00	1689.74 c.m"
"		Rainfall losses	27.188	2.068	27.188 mm"
"		Runoff depth	23.555	48.675	23.555 mm"
"		Runoff volume	784.37	0.00	784.38 c.m"
"		Runoff coefficient	0.464	0.000	0.464 "
"		Maximum flow	0.356	0.000	0.356 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.356	0.634	0.407	0.177"
" 33		CATCHMENT 3000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	3000	Catchment 3000"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			

	0.347	0.634	0.407	0.177 c.m/sec"	
"	Catchment 3000	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	4.708	0.854	2.132	minutes"
"	Time to Centroid	110.182	111.691	111.191	minutes"
"	Rainfall depth	50.743	50.743	50.743	mm"
"	Rainfall volume	342.51	342.51	685.03	c.m"
"	Rainfall losses	27.326	3.537	15.432	mm"
"	Runoff depth	23.417	47.206	35.311	mm"
"	Runoff volume	158.07	318.64	476.70	c.m"
"	Runoff coefficient	0.461	0.930	0.696	"
"	Maximum flow	0.157	0.219	0.347	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.347	0.687	0.407	0.177"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.347	0.687	0.687	0.177"	
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow	0.687	c.m/sec"		
"	Hydrograph volume	11277.046	c.m"		
"	0.347	0.687	0.687	0.687"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.347	0.000	0.687	0.687"	
" 33	CATCHMENT 7000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	7000 Catchment 7000"				
"	0.000 % Impervious"				
"	0.490 Total Area"				
"	7.500 Flow length"				
"	33.000 Overland Slope"				
"	0.490 Pervious Area"				
"	7.500 Pervious length"				
"	33.000 Pervious slope"				
"	0.000 Impervious Area"				
"	7.500 Impervious length"				
"	33.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				

"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.136	0.000	0.687	0.687 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	2.063	0.374	2.063 minutes"
"		Time to Centroid	106.443	111.657	106.443 minutes"
"		Rainfall depth	50.743	50.743	50.743 mm"
"		Rainfall volume	248.64	0.00	248.64 c.m"
"		Rainfall losses	27.370	6.545	27.370 mm"
"		Runoff depth	23.373	44.198	23.373 mm"
"		Runoff volume	114.53	0.00	114.53 c.m"
"		Runoff coefficient	0.461	0.000	0.461 "
"		Maximum flow	0.136	0.000	0.136 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.136	0.136	0.687	0.687"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.136	0.136	0.136	0.687"
" 40		HYDROGRAPH Combine 300"			
"	6	Combine "			
"	300	Node #"			
"		To West Farm Field"			
"		Maximum flow	0.136		c.m/sec"
"		Hydrograph volume	114.529		c.m"
"		0.136	0.136	0.136	0.136"
" 40		HYDROGRAPH Confluence 100"			
"	7	Confluence "			
"	100	Node #"			
"		To Highway 6 Roadside Ditch"			
"		Maximum flow	0.177		c.m/sec"
"		Hydrograph volume	171.938		c.m"
"		0.136	0.177	0.136	0.000"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.136	0.177	0.177	0.000"
" 40		HYDROGRAPH Combine 200"			
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	0.718		c.m/sec"
"		Hydrograph volume	11448.981		c.m"
"		0.136	0.177	0.177	0.718"
" 40		HYDROGRAPH Confluence 200"			
"	7	Confluence "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	0.718		c.m/sec"

"	Hydrograph volume	11448.983	c.m"
"	0.136 0.718 0.177	0.000"	
" 40	HYDROGRAPH Copy to Outflow"		
"	8 Copy to Outflow"		
"	0.136 0.718 0.718	0.000"	
" 40	HYDROGRAPH Combine 300"		
"	6 Combine "		
"	300 Node #"		
"	To West Farm Field"		
"	Maximum flow	0.755	c.m/sec"
"	Hydrograph volume	11563.512	c.m"
"	0.136 0.718 0.718	0.755"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	26.276	hectare"
"	Total % impervious	66.657"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Post_10yr.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/5/2025 at 11:06:22 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          627.308  Coefficient A"
"          0.014  Constant B"
"          0.687  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          150.159  mm/hr"
"          Total depth          58.119  mm"
"          6  010hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000  % Impervious"
"          0.120  Total Area"
"          55.000  Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000  Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000  Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```


"	1.500	Impervious Depression storage"				
"		0.022	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	13.195	2.402	9.059	minutes"
"		Time to Centroid	123.483	113.773	119.762	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	52.31	17.44	69.74	c.m"
"		Rainfall losses	28.015	2.014	21.515	mm"
"		Runoff depth	30.104	56.105	36.604	mm"
"		Runoff volume	27.09	16.83	43.93	c.m"
"		Runoff coefficient	0.518	0.965	0.630	"
"		Maximum flow	0.017	0.011	0.022	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.022	0.022	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.198	0.022	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.525	0.278	1.424	minutes"
"		Time to Centroid	107.285	110.607	107.552	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	309.19	16.27	325.47	c.m"
"		Rainfall losses	28.307	8.539	27.318	mm"
"		Runoff depth	29.812	49.580	30.801	mm"

"	Runoff volume	158.60	13.88	172.48	c.m"
"	Runoff coefficient	0.513	0.853	0.530	"
"	Maximum flow	0.188	0.010	0.198	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.198	0.216	0.000	0.000"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.198	0.216	0.216	0.000"	
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.216		c.m/sec"	
"	Hydrograph volume	216.410		c.m"	
"	0.198	0.216	0.216	0.216"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.198	0.000	0.216	0.216"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	10.093	0.000	0.216	0.216 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	13.212	2.405	3.683	minutes"
"	Time to Centroid	123.506	113.777	114.928	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"

"		Rainfall volume	0.3667	1.4669	1.8337	ha-m"
"		Rainfall losses	28.011	2.016	7.215	mm"
"		Runoff depth	30.108	56.104	50.905	mm"
"		Runoff volume	0.1900	1.4161	1.6060	ha-m"
"		Runoff coefficient	0.518	0.965	0.876	"
"		Maximum flow	1.177	9.630	10.093	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"			10.093	10.093	0.216	0.216"
" 33		CATCHMENT 2000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	2000	Catchment 2000"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n' "				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n' "				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"			0.383	10.093	0.216	0.216 c.m/sec"
"		Catchment 2000	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	12.310	2.241	9.821	minutes"
"		Time to Centroid	122.260	113.547	120.106	minutes"
"		Rainfall depth	58.119	58.119	58.119	mm"
"		Rainfall volume	997.91	176.10	1174.01	c.m"
"		Rainfall losses	27.960	1.991	24.064	mm"
"		Runoff depth	30.159	56.128	34.055	mm"
"		Runoff volume	517.84	170.07	687.90	c.m"
"		Runoff coefficient	0.519	0.966	0.586	"
"		Maximum flow	0.323	0.116	0.383	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"			0.383	10.344	0.216	0.216"
" 54		POND DESIGN"				

"	10.344	Current peak flow	c.m/sec"
"	3.341	Target outflow	c.m/sec"
"	16748.3	Hydrograph volume	c.m"
"	18.	Number of stages"	
"	421.500	Minimum water level	metre"
"	423.200	Maximum water level	metre"
"	421.500	Starting water level	metre"
"	0	Keep Design Data: 1 = True; 0 = False"	
"		Level Discharge	Volume"
"	421.500	0.000	0.000"
"	421.600	0.00700	1070.100"
"	421.700	0.01300	2176.600"
"	421.800	0.01900	3319.800"
"	421.900	0.02300	4500.000"
"	422.000	0.02600	5717.200"
"	422.100	0.07100	6977.200"
"	422.200	0.1940	8275.500"
"	422.300	0.3520	9602.300"
"	422.400	0.3950	10957.80"
"	422.500	0.5140	12342.10"
"	422.600	0.7980	13755.30"
"	422.700	0.9580	15197.70"
"	422.800	1.614	16669.40"
"	422.900	2.846	18170.60"
"	423.000	4.482	19701.40"
"	423.100	6.460	21262.00"
"	423.200	8.746	22852.50"
"		Peak outflow	0.562 c.m/sec"
"		Maximum level	422.517 metre"
"		Maximum storage	12581.290 c.m"
"		Centroidal lag	23.904 hours"
"	0.383	10.344	0.562 0.216 c.m/sec"
" 40	HYDROGRAPH Next link "		
"	5	Next link "	
"	0.383	0.562	0.562 0.216"
" 33	CATCHMENT 4000"		
"	1	Triangular SCS"	
"	1	Equal length"	
"	2	Horton equation"	
"	4000	Catchment 4000"	
"	0.000	% Impervious"	
"	3.330	Total Area"	
"	120.000	Flow length"	
"	3.000	Overland Slope"	
"	3.330	Pervious Area"	
"	120.000	Pervious length"	
"	3.000	Pervious slope"	
"	0.000	Impervious Area"	
"	120.000	Impervious length"	
"	3.000	Impervious slope"	

"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.455	0.562	0.562	0.216 c.m/sec"
"		Catchment 4000	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	21.072	3.835	21.072 minutes"
"		Time to Centroid	134.304	116.233	134.304 minutes"
"		Rainfall depth	58.119	58.119	58.119 mm"
"		Rainfall volume	1935.36	0.00	1935.37 c.m"
"		Rainfall losses	27.871	2.469	27.871 mm"
"		Runoff depth	30.248	55.650	30.248 mm"
"		Runoff volume	1007.27	0.00	1007.27 c.m"
"		Runoff coefficient	0.520	0.000	0.520 "
"		Maximum flow	0.455	0.000	0.455 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.455	0.832	0.562	0.216"
" 33		CATCHMENT 3000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	3000	Catchment 3000"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			

	0.424	0.832	0.562	0.216 c.m/sec"	
"	Catchment 3000	Pervious	Impervious	Total Area	"
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	4.437	0.808	2.102	minutes"
"	Time to Centroid	111.465	111.382	111.412	minutes"
"	Rainfall depth	58.119	58.119	58.119	mm"
"	Rainfall volume	392.30	392.30	784.61	c.m"
"	Rainfall losses	28.095	3.951	16.023	mm"
"	Runoff depth	30.025	54.169	42.097	mm"
"	Runoff volume	202.67	365.64	568.30	c.m"
"	Runoff coefficient	0.517	0.932	0.724	"
"	Maximum flow	0.180	0.250	0.424	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4	Add Runoff "			
"	0.424	0.907	0.562	0.216"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8	Copy to Outflow"			
"	0.424	0.907	0.907	0.216"	
" 40	HYDROGRAPH Combine 200"				
"	6	Combine "			
"	200	Node #"			
"	To Northeast Wetland"				
"	Maximum flow	0.907	c.m/sec"		
"	Hydrograph volume	13946.430	c.m"		
"	0.424	0.907	0.907	0.907"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2	Start - New Tributary"			
"	0.424	0.000	0.907	0.907"	
" 33	CATCHMENT 7000"				
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	7000	Catchment 7000"			
"	0.000	% Impervious"			
"	0.490	Total Area"			
"	7.500	Flow length"			
"	33.000	Overland Slope"			
"	0.490	Pervious Area"			
"	7.500	Pervious length"			
"	33.000	Pervious slope"			
"	0.000	Impervious Area"			
"	7.500	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			

"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.169	0.000	0.907	0.907 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	1.945	0.354	1.945 minutes"
"		Time to Centroid	107.865	111.139	107.865 minutes"
"		Rainfall depth	58.119	58.119	58.119 mm"
"		Rainfall volume	284.78	0.00	284.78 c.m"
"		Rainfall losses	28.159	7.499	28.159 mm"
"		Runoff depth	29.960	50.620	29.960 mm"
"		Runoff volume	146.80	0.00	146.81 c.m"
"		Runoff coefficient	0.515	0.000	0.515 "
"		Maximum flow	0.169	0.000	0.169 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.169	0.169	0.907	0.907"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.169	0.169	0.169	0.907"
" 40		HYDROGRAPH Combine 300"			
"	6	Combine "			
"	300	Node #"			
"		To West Farm Field"			
"		Maximum flow	0.169		c.m/sec"
"		Hydrograph volume	146.805		c.m"
"		0.169	0.169	0.169	0.169"
" 40		HYDROGRAPH Confluence 100"			
"	7	Confluence "			
"	100	Node #"			
"		To Highway 6 Roadside Ditch"			
"		Maximum flow	0.216		c.m/sec"
"		Hydrograph volume	216.410		c.m"
"		0.169	0.216	0.169	0.000"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.169	0.216	0.216	0.000"
" 40		HYDROGRAPH Combine 200"			
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	0.946		c.m/sec"
"		Hydrograph volume	14162.840		c.m"
"		0.169	0.216	0.216	0.946"
" 40		HYDROGRAPH Confluence 200"			
"	7	Confluence "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	0.946		c.m/sec"

"	Hydrograph volume	14162.840	c.m"
"	0.169 0.946 0.216	0.000"	
" 40	HYDROGRAPH Copy to Outflow"		
"	8 Copy to Outflow"		
"	0.169 0.946 0.946	0.000"	
" 40	HYDROGRAPH Combine 300"		
"	6 Combine "		
"	300 Node #"		
"	To West Farm Field"		
"	Maximum flow	0.975	c.m/sec"
"	Hydrograph volume	14309.646	c.m"
"	0.169 0.946 0.946	0.975"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	26.276	hectare"
"	Total % impervious	66.657"	
" 19	EXIT"		


```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                          B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Post_25yr.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/5/2025 at 11:16:58 AM"
" 31          TIME PARAMETERS"
"          5.000  Time Step"
"          240.000  Max. Storm length"
"          2000.000  Max. Hydrograph"
" 32          STORM Chicago storm"
"          1  Chicago storm"
"          746.059  Coefficient A"
"          0.085  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000  Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          175.653  mm/hr"
"          Total depth          67.239  mm"
"          6  025hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000  % Impervious"
"          0.120  Total Area"
"          55.000  Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000  Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000  Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.029	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	12.358	2.256	8.731	minutes"
"		Time to Centroid	124.313	113.098	120.286	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	60.51	20.17	80.69	c.m"
"		Rainfall losses	28.460	2.063	21.861	mm"
"		Runoff depth	38.779	65.175	45.378	mm"
"		Runoff volume	34.90	19.55	54.45	c.m"
"		Runoff coefficient	0.577	0.969	0.675	"
"		Maximum flow	0.021	0.013	0.029	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.029	0.029	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.242	0.029	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.428	0.261	1.342	minutes"
"		Time to Centroid	108.971	109.975	109.045	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	357.71	18.83	376.54	c.m"
"		Rainfall losses	29.074	9.934	28.117	mm"
"		Runoff depth	38.165	57.305	39.122	mm"

"	Runoff volume	203.04	16.05	219.08	c.m"
"	Runoff coefficient	0.568	0.852	0.582	"
"	Maximum flow	0.230	0.012	0.242	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.242	0.265	0.000	0.000"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.242	0.265	0.265	0.000"	
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.265		c.m/sec"	
"	Hydrograph volume	273.537		c.m"	
"	0.242	0.265	0.265	0.265"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.242	0.000	0.265	0.265"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	12.028	0.000	0.265	0.265 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	12.373	2.259	3.568	minutes"
"	Time to Centroid	124.335	113.103	114.557	minutes"
"	Rainfall depth	67.239	67.239	67.239	mm"

"		Rainfall volume	0.4243	1.6971	2.1214	ha-m"
"		Rainfall losses	28.462	2.063	7.343	mm"
"		Runoff depth	38.777	65.175	59.896	mm"
"		Runoff volume	0.2447	1.6450	1.8897	ha-m"
"		Runoff coefficient	0.577	0.969	0.891	"
"		Maximum flow	1.497	11.312	12.028	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"			12.028	12.028	0.265	0.265"
" 33		CATCHMENT 2000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	2000	Catchment 2000"				
"	15.000	% Impervious"				
"	2.020	Total Area"				
"	40.000	Flow length"				
"	2.000	Overland Slope"				
"	1.717	Pervious Area"				
"	40.000	Pervious length"				
"	2.000	Pervious slope"				
"	0.303	Impervious Area"				
"	40.000	Impervious length"				
"	2.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"			0.509	12.028	0.265	0.265 c.m/sec"
"		Catchment 2000	Pervious	Impervious	Total Area	"
"		Surface Area	1.717	0.303	2.020	hectare"
"		Time of concentration	11.529	2.104	9.376	minutes"
"		Time to Centroid	123.146	112.845	120.792	minutes"
"		Rainfall depth	67.239	67.239	67.239	mm"
"		Rainfall volume	1154.49	203.73	1358.23	c.m"
"		Rainfall losses	28.447	2.145	24.501	mm"
"		Runoff depth	38.792	65.094	42.738	mm"
"		Runoff volume	666.06	197.23	863.30	c.m"
"		Runoff coefficient	0.577	0.968	0.636	"
"		Maximum flow	0.434	0.136	0.509	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"			0.509	12.384	0.265	0.265"
" 54		POND DESIGN"				

"	12.384	Current peak flow	c.m/sec"
"	3.341	Target outflow	c.m/sec"
"	19760.4	Hydrograph volume	c.m"
"	18.	Number of stages"	
"	421.500	Minimum water level	metre"
"	423.200	Maximum water level	metre"
"	421.500	Starting water level	metre"
"	0	Keep Design Data: 1 = True; 0 = False"	
"		Level Discharge	Volume"
"	421.500	0.000	0.000"
"	421.600	0.00700	1070.100"
"	421.700	0.01300	2176.600"
"	421.800	0.01900	3319.800"
"	421.900	0.02300	4500.000"
"	422.000	0.02600	5717.200"
"	422.100	0.07100	6977.200"
"	422.200	0.1940	8275.500"
"	422.300	0.3520	9602.300"
"	422.400	0.3950	10957.80"
"	422.500	0.5140	12342.10"
"	422.600	0.7980	13755.30"
"	422.700	0.9580	15197.70"
"	422.800	1.614	16669.40"
"	422.900	2.846	18170.60"
"	423.000	4.482	19701.40"
"	423.100	6.460	21262.00"
"	423.200	8.746	22852.50"
"		Peak outflow	0.835 c.m/sec"
"		Maximum level	422.623 metre"
"		Maximum storage	14091.537 c.m"
"		Centroidal lag	20.999 hours"
"	0.509	12.384	0.835 0.265 c.m/sec"
" 40		HYDROGRAPH Next link "	
"	5	Next link "	
"	0.509	0.835	0.835 0.265"
" 33		CATCHMENT 4000"	
"	1	Triangular SCS"	
"	1	Equal length"	
"	2	Horton equation"	
"	4000	Catchment 4000"	
"	0.000	% Impervious"	
"	3.330	Total Area"	
"	120.000	Flow length"	
"	3.000	Overland Slope"	
"	3.330	Pervious Area"	
"	120.000	Pervious length"	
"	3.000	Pervious slope"	
"	0.000	Impervious Area"	
"	120.000	Impervious length"	
"	3.000	Impervious slope"	

"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.607 0.835 0.835 0.265 c.m/sec"			
"		Catchment 4000	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	19.735	3.602	19.735 minutes"
"		Time to Centroid	134.608	115.439	134.608 minutes"
"		Rainfall depth	67.239	67.239	67.239 mm"
"		Rainfall volume	2239.05	0.00	2239.05 c.m"
"		Rainfall losses	28.441	2.959	28.441 mm"
"		Runoff depth	38.798	64.280	38.798 mm"
"		Runoff volume	1291.96	0.00	1291.97 c.m"
"		Runoff coefficient	0.577	0.000	0.577 "
"		Maximum flow	0.607	0.000	0.607 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.607 1.111 0.835 0.265"			
" 33		CATCHMENT 3000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	3000	Catchment 3000"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			

	0.525	1.111	0.835	0.265 c.m/sec"
"	Catchment 3000	Pervious	Impervious	Total Area "
"	Surface Area	0.675	0.675	1.350 hectare"
"	Time of concentration	4.156	0.759	2.050 minutes"
"	Time to Centroid	112.936	110.977	111.722 minutes"
"	Rainfall depth	67.239	67.239	67.239 mm"
"	Rainfall volume	453.86	453.86	907.72 c.m"
"	Rainfall losses	28.833	4.588	16.711 mm"
"	Runoff depth	38.406	62.651	50.528 mm"
"	Runoff volume	259.24	422.89	682.13 c.m"
"	Runoff coefficient	0.571	0.932	0.751 "
"	Maximum flow	0.234	0.291	0.525 c.m/sec"
" 40	HYDROGRAPH Add Runoff "			
"	4 Add Runoff "			
"	0.525	1.185	0.835	0.265"
" 40	HYDROGRAPH Copy to Outflow"			
"	8 Copy to Outflow"			
"	0.525	1.185	1.185	0.265"
" 40	HYDROGRAPH Combine 200"			
"	6 Combine "			
"	200 Node #"			
"	To Northeast Wetland"			
"	Maximum flow	1.185	c.m/sec"	
"	Hydrograph volume	17323.447	c.m"	
"	0.525	1.185	1.185	1.185"
" 40	HYDROGRAPH Start - New Tributary"			
"	2 Start - New Tributary"			
"	0.525	0.000	1.185	1.185"
" 33	CATCHMENT 7000"			
"	1 Triangular SCS"			
"	1 Equal length"			
"	2 Horton equation"			
"	7000 Catchment 7000"			
"	0.000 % Impervious"			
"	0.490 Total Area"			
"	7.500 Flow length"			
"	33.000 Overland Slope"			
"	0.490 Pervious Area"			
"	7.500 Pervious length"			
"	33.000 Pervious slope"			
"	0.000 Impervious Area"			
"	7.500 Impervious length"			
"	33.000 Impervious slope"			
"	0.250 Pervious Manning 'n'"			
"	30.000 Pervious Max.infiltration"			
"	5.000 Pervious Min.infiltration"			
"	0.250 Pervious Lag constant (hours)"			
"	5.000 Pervious Depression storage"			
"	0.015 Impervious Manning 'n'"			
"	0.000 Impervious Max.infiltration"			

"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.210	0.000	1.185	1.185 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	1.821	0.332	1.821 minutes"
"		Time to Centroid	109.483	110.512	109.483 minutes"
"		Rainfall depth	67.239	67.239	67.239 mm"
"		Rainfall volume	329.47	0.00	329.47 c.m"
"		Rainfall losses	28.721	8.742	28.721 mm"
"		Runoff depth	38.518	58.496	38.518 mm"
"		Runoff volume	188.74	0.00	188.74 c.m"
"		Runoff coefficient	0.573	0.000	0.573 "
"		Maximum flow	0.210	0.000	0.210 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.210	0.210	1.185	1.185"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.210	0.210	0.210	1.185"
" 40		HYDROGRAPH Combine 300"			
"	6	Combine "			
"	300	Node #"			
"		To West Farm Field"			
"		Maximum flow	0.210		c.m/sec"
"		Hydrograph volume	188.740		c.m"
"		0.210	0.210	0.210	0.210"
" 40		HYDROGRAPH Confluence 100"			
"	7	Confluence "			
"	100	Node #"			
"		To Highway 6 Roadside Ditch"			
"		Maximum flow	0.265		c.m/sec"
"		Hydrograph volume	273.537		c.m"
"		0.210	0.265	0.210	0.000"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.210	0.265	0.265	0.000"
" 40		HYDROGRAPH Combine 200"			
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	1.233		c.m/sec"
"		Hydrograph volume	17596.980		c.m"
"		0.210	0.265	0.265	1.233"
" 40		HYDROGRAPH Confluence 200"			
"	7	Confluence "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	1.233		c.m/sec"

"	Hydrograph volume	17596.980	c.m"
"	0.210 1.233 0.265	0.000"	
" 40	HYDROGRAPH Copy to Outflow"		
"	8 Copy to Outflow"		
"	0.210 1.233 1.233	0.000"	
" 40	HYDROGRAPH Combine 300"		
"	6 Combine "		
"	300 Node #"		
"	To West Farm Field"		
"	Maximum flow	1.292	c.m/sec"
"	Hydrograph volume	17785.725	c.m"
"	0.210 1.233 1.233	1.292"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	26.276	hectare"
"	Total % impervious	66.657"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Post_50yr.out"
"          Licensee name:                     "
"          Company                             "
"          Date & Time last used:              2/5/2025 at 11:19:40 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          820.361 Coefficient A"
"          0.010  Constant B"
"          0.691  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          194.803  mm/hr"
"          Total depth                74.358  mm"
"          6  050hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250 Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250 Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015 Impervious Manning 'n'"
"          0.000 Impervious Max.infiltration"
"          0.000 Impervious Min.infiltration"
"          0.001 Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.034	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	11.839	2.164	8.495	minutes"
"		Time to Centroid	125.251	112.774	120.938	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	66.92	22.31	89.23	c.m"
"		Rainfall losses	28.786	2.145	22.126	mm"
"		Runoff depth	45.572	72.213	52.232	mm"
"		Runoff volume	41.01	21.66	62.68	c.m"
"		Runoff coefficient	0.613	0.971	0.702	"
"		Maximum flow	0.025	0.015	0.034	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.034	0.034	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.272	0.034	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.368	0.250	1.290	minutes"
"		Time to Centroid	110.205	109.690	110.169	minutes"
"		Rainfall depth	74.358	74.358	74.358	mm"
"		Rainfall volume	395.58	20.82	416.40	c.m"
"		Rainfall losses	29.637	11.032	28.707	mm"
"		Runoff depth	44.721	63.326	45.651	mm"

"	Runoff volume	237.91	17.73	255.65	c.m"
"	Runoff coefficient	0.601	0.852	0.614	"
"	Maximum flow	0.259	0.013	0.272	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.272 0.300 0.000 0.000"				
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.272 0.300 0.300 0.000"				
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.300		c.m/sec"	
"	Hydrograph volume	318.324		c.m"	
"	0.272 0.300 0.300 0.300"				
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.272 0.000 0.300 0.300"				
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	13.467 0.000 0.300 0.300 c.m/sec"				
"	Catchment 1000 Pervious Impervious Total Area "				
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	11.854	2.167	3.487	minutes"
"	Time to Centroid	125.272	112.780	114.482	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"

"	Rainfall volume	0.4692	1.8768	2.3460	ha-m"
"	Rainfall losses	28.785	2.143	7.472	mm"
"	Runoff depth	45.573	72.214	66.886	mm"
"	Runoff volume	0.2876	1.8227	2.1103	ha-m"
"	Runoff coefficient	0.613	0.971	0.900	"
"	Maximum flow	1.779	12.562	13.467	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		13.467	13.467	0.300	0.300"
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	2000 Catchment 2000"				
"	15.000 % Impervious"				
"	2.020 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	1.717 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	0.303 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.595	13.467	0.300	0.300 c.m/sec"
"	Catchment 2000	Pervious	Impervious	Total Area	"
"	Surface Area	1.717	0.303	2.020	hectare"
"	Time of concentration	11.045	2.019	9.073	minutes"
"	Time to Centroid	124.131	112.509	121.592	minutes"
"	Rainfall depth	74.358	74.358	74.358	mm"
"	Rainfall volume	1276.72	225.30	1502.03	c.m"
"	Rainfall losses	28.840	2.269	24.855	mm"
"	Runoff depth	45.518	72.088	49.503	mm"
"	Runoff volume	781.54	218.43	999.97	c.m"
"	Runoff coefficient	0.612	0.969	0.666	"
"	Maximum flow	0.514	0.151	0.595	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.595	13.894	0.300	0.300"
" 54	POND DESIGN"				

"	13.894	Current peak flow	c.m/sec"
"	3.341	Target outflow	c.m/sec"
"	22102.5	Hydrograph volume	c.m"
"	18.	Number of stages"	
"	421.500	Minimum water level	metre"
"	423.200	Maximum water level	metre"
"	421.500	Starting water level	metre"
"	0	Keep Design Data: 1 = True; 0 = False"	
"		Level Discharge	Volume"
"	421.500	0.000	0.000"
"	421.600	0.00700	1070.100"
"	421.700	0.01300	2176.600"
"	421.800	0.01900	3319.800"
"	421.900	0.02300	4500.000"
"	422.000	0.02600	5717.200"
"	422.100	0.07100	6977.200"
"	422.200	0.1940	8275.500"
"	422.300	0.3520	9602.300"
"	422.400	0.3950	10957.80"
"	422.500	0.5140	12342.10"
"	422.600	0.7980	13755.30"
"	422.700	0.9580	15197.70"
"	422.800	1.614	16669.40"
"	422.900	2.846	18170.60"
"	423.000	4.482	19701.40"
"	423.100	6.460	21262.00"
"	423.200	8.746	22852.50"
"		Peak outflow	1.045 c.m/sec"
"		Maximum level	422.713 metre"
"		Maximum storage	15395.049 c.m"
"		Centroidal lag	19.343 hours"
"	0.595	13.894	1.045 0.300 c.m/sec"
" 40	HYDROGRAPH Next link "		
"	5	Next link "	
"	0.595	1.045	1.045 0.300"
" 33	CATCHMENT 4000"		
"	1	Triangular SCS"	
"	1	Equal length"	
"	2	Horton equation"	
"	4000	Catchment 4000"	
"	0.000	% Impervious"	
"	3.330	Total Area"	
"	120.000	Flow length"	
"	3.000	Overland Slope"	
"	3.330	Pervious Area"	
"	120.000	Pervious length"	
"	3.000	Pervious slope"	
"	0.000	Impervious Area"	
"	120.000	Impervious length"	
"	3.000	Impervious slope"	

"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.720	1.045	1.045	0.300 c.m/sec"
"		Catchment 4000	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	18.906	3.456	18.906 minutes"
"		Time to Centroid	135.377	115.016	135.377 minutes"
"		Rainfall depth	74.358	74.358	74.358 mm"
"		Rainfall volume	2476.11	0.00	2476.11 c.m"
"		Rainfall losses	28.813	3.112	28.813 mm"
"		Runoff depth	45.544	71.246	45.544 mm"
"		Runoff volume	1516.63	0.00	1516.63 c.m"
"		Runoff coefficient	0.613	0.000	0.613 "
"		Maximum flow	0.720	0.000	0.720 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.720	1.463	1.045	0.300"
" 33		CATCHMENT 3000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	3000	Catchment 3000"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			

	0.597	1.463	1.045	0.300 c.m/sec"
"	Catchment 3000	Pervious	Impervious	Total Area "
"	Surface Area	0.675	0.675	1.350 hectare"
"	Time of concentration	3.981	0.728	2.007 minutes"
"	Time to Centroid	114.123	110.827	112.123 minutes"
"	Rainfall depth	74.358	74.358	74.358 mm"
"	Rainfall volume	501.92	501.92	1003.83 c.m"
"	Rainfall losses	29.474	5.085	17.279 mm"
"	Runoff depth	44.884	69.273	57.079 mm"
"	Runoff volume	302.97	467.59	770.56 c.m"
"	Runoff coefficient	0.604	0.932	0.768 "
"	Maximum flow	0.276	0.321	0.597 c.m/sec"
" 40	HYDROGRAPH Add Runoff "			
"	4 Add Runoff "			
"	0.597	1.561	1.045	0.300"
" 40	HYDROGRAPH Copy to Outflow"			
"	8 Copy to Outflow"			
"	0.597	1.561	1.561	0.300"
" 40	HYDROGRAPH Combine 200"			
"	6 Combine "			
"	200 Node #"			
"	To Northeast Wetland"			
"	Maximum flow		1.561	c.m/sec"
"	Hydrograph volume		19945.855	c.m"
"	0.597	1.561	1.561	1.561"
" 40	HYDROGRAPH Start - New Tributary"			
"	2 Start - New Tributary"			
"	0.597	0.000	1.561	1.561"
" 33	CATCHMENT 7000"			
"	1 Triangular SCS"			
"	1 Equal length"			
"	2 Horton equation"			
"	7000 Catchment 7000"			
"	0.000 % Impervious"			
"	0.490 Total Area"			
"	7.500 Flow length"			
"	33.000 Overland Slope"			
"	0.490 Pervious Area"			
"	7.500 Pervious length"			
"	33.000 Pervious slope"			
"	0.000 Impervious Area"			
"	7.500 Impervious length"			
"	33.000 Impervious slope"			
"	0.250 Pervious Manning 'n'"			
"	30.000 Pervious Max.infiltration"			
"	5.000 Pervious Min.infiltration"			
"	0.250 Pervious Lag constant (hours)"			
"	5.000 Pervious Depression storage"			
"	0.015 Impervious Manning 'n'"			
"	0.000 Impervious Max.infiltration"			

"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.239	0.000	1.561	1.561 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	1.745	0.319	1.745 minutes"
"		Time to Centroid	110.683	110.237	110.683 minutes"
"		Rainfall depth	74.358	74.358	74.358 mm"
"		Rainfall volume	364.35	0.00	364.35 c.m"
"		Rainfall losses	29.149	9.736	29.149 mm"
"		Runoff depth	45.208	64.622	45.208 mm"
"		Runoff volume	221.52	0.00	221.52 c.m"
"		Runoff coefficient	0.608	0.000	0.608 "
"		Maximum flow	0.239	0.000	0.239 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.239	0.239	1.561	1.561"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.239	0.239	0.239	1.561"
" 40		HYDROGRAPH Combine 300"			
"	6	Combine "			
"	300	Node #"			
"		To West Farm Field"			
"		Maximum flow	0.239	c.m/sec"	
"		Hydrograph volume	221.521	c.m"	
"		0.239	0.239	0.239	0.239"
" 40		HYDROGRAPH Confluence 100"			
"	7	Confluence "			
"	100	Node #"			
"		To Highway 6 Roadside Ditch"			
"		Maximum flow	0.300	c.m/sec"	
"		Hydrograph volume	318.324	c.m"	
"		0.239	0.300	0.239	0.000"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.239	0.300	0.300	0.000"
" 40		HYDROGRAPH Combine 200"			
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	1.614	c.m/sec"	
"		Hydrograph volume	20264.172	c.m"	
"		0.239	0.300	0.300	1.614"
" 40		HYDROGRAPH Confluence 200"			
"	7	Confluence "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	1.614	c.m/sec"	

"	Hydrograph volume	20264.172	c.m"
"	0.239 1.614 0.300	0.000"	
" 40	HYDROGRAPH Copy to Outflow"		
"	8 Copy to Outflow"		
"	0.239 1.614 1.614	0.000"	
" 40	HYDROGRAPH Combine 300"		
"	6 Combine "		
"	300 Node #"		
"	To West Farm Field"		
"	Maximum flow	1.643	c.m/sec"
"	Hydrograph volume	20485.707	c.m"
"	0.239 1.614 1.614	1.643"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	26.276	hectare"
"	Total % impervious	66.657"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                    Post_100yr.out"
"          Licensee name:                      "
"          Company                            "
"          Date & Time last used:              2/5/2025 at 11:22:08 AM"
" 31      TIME PARAMETERS"
"          5.000  Time Step"
"          240.000 Max. Storm length"
"          2000.000 Max. Hydrograph"
" 32      STORM Chicago storm"
"          1  Chicago storm"
"          901.088 Coefficient A"
"          0.043  Constant B"
"          0.692  Exponent C"
"          0.375  Fraction R"
"          240.000 Duration"
"          1.000  Time step multiplier"
"          Maximum intensity          212.928  mm/hr"
"          Total depth                81.221  mm"
"          6  100hyd  Hydrograph extension used in this file"
" 33      CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000 % Impervious"
"          0.120  Total Area"
"          55.000 Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000 Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000 Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000 Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"
"          0.250  Pervious Lag constant (hours)"
"          5.000  Pervious Depression storage"
"          0.015  Impervious Manning 'n'"
"          0.000  Impervious Max.infiltration"
"          0.000  Impervious Min.infiltration"
"          0.001  Impervious Lag constant (hours)"

```

"	1.500	Impervious Depression storage"				
"		0.039	0.000	0.000	0.000 c.m/sec"	
"		Catchment 5000	Pervious	Impervious	Total Area	"
"		Surface Area	0.090	0.030	0.120	hectare"
"		Time of concentration	11.412	2.089	8.285	minutes"
"		Time to Centroid	125.480	112.461	121.112	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	73.10	24.37	97.47	c.m"
"		Rainfall losses	29.094	2.284	22.391	mm"
"		Runoff depth	52.127	78.937	58.829	mm"
"		Runoff volume	46.91	23.68	70.60	c.m"
"		Runoff coefficient	0.642	0.972	0.724	"
"		Maximum flow	0.030	0.016	0.039	c.m/sec"
" 40		HYDROGRAPH Add Runoff "				
"	4	Add Runoff "				
"		0.039	0.039	0.000	0.000"	
" 33		CATCHMENT 6000"				
"	1	Triangular SCS"				
"	1	Equal length"				
"	2	Horton equation"				
"	6000	Catchment 6000"				
"	5.000	% Impervious"				
"	0.560	Total Area"				
"	5.000	Flow length"				
"	33.000	Overland Slope"				
"	0.532	Pervious Area"				
"	5.000	Pervious length"				
"	33.000	Pervious slope"				
"	0.028	Impervious Area"				
"	5.000	Impervious length"				
"	33.000	Impervious slope"				
"	0.250	Pervious Manning 'n'"				
"	30.000	Pervious Max.infiltration"				
"	5.000	Pervious Min.infiltration"				
"	0.250	Pervious Lag constant (hours)"				
"	5.000	Pervious Depression storage"				
"	0.015	Impervious Manning 'n'"				
"	0.000	Impervious Max.infiltration"				
"	0.000	Impervious Min.infiltration"				
"	0.001	Impervious Lag constant (hours)"				
"	1.500	Impervious Depression storage"				
"		0.296	0.039	0.000	0.000 c.m/sec"	
"		Catchment 6000	Pervious	Impervious	Total Area	"
"		Surface Area	0.532	0.028	0.560	hectare"
"		Time of concentration	1.319	0.241	1.247	minutes"
"		Time to Centroid	110.907	109.390	110.806	minutes"
"		Rainfall depth	81.221	81.221	81.221	mm"
"		Rainfall volume	432.10	22.74	454.84	c.m"
"		Rainfall losses	30.156	12.072	29.252	mm"
"		Runoff depth	51.065	69.149	51.969	mm"

"	Runoff volume	271.67	19.36	291.03	c.m"
"	Runoff coefficient	0.629	0.851	0.640	"
"	Maximum flow	0.282	0.014	0.296	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.296	0.328	0.000	0.000"	
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"	0.296	0.328	0.328	0.000"	
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow	0.328		c.m/sec"	
"	Hydrograph volume	361.624		c.m"	
"	0.296	0.328	0.328	0.328"	
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"	0.296	0.000	0.328	0.328"	
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"	14.844	0.000	0.328	0.328 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	11.426	2.091	3.414	minutes"
"	Time to Centroid	125.499	112.466	114.313	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"

"	Rainfall volume	0.5125	2.0500	2.5625	ha-m"
"	Rainfall losses	29.091	2.281	7.643	mm"
"	Runoff depth	52.130	78.940	73.578	mm"
"	Runoff volume	0.3289	1.9924	2.3214	ha-m"
"	Runoff coefficient	0.642	0.972	0.906	"
"	Maximum flow	2.075	13.744	14.844	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		14.844	14.844	0.328	0.328"
" 33	CATCHMENT 2000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	2000 Catchment 2000"				
"	15.000 % Impervious"				
"	2.020 Total Area"				
"	40.000 Flow length"				
"	2.000 Overland Slope"				
"	1.717 Pervious Area"				
"	40.000 Pervious length"				
"	2.000 Pervious slope"				
"	0.303 Impervious Area"				
"	40.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.001 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				
"		0.686	14.844	0.328	0.328 c.m/sec"
"	Catchment 2000	Pervious	Impervious	Total Area	"
"	Surface Area	1.717	0.303	2.020	hectare"
"	Time of concentration	10.647	1.949	8.813	minutes"
"	Time to Centroid	124.365	112.180	121.796	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"
"	Rainfall volume	1394.56	246.10	1640.66	c.m"
"	Rainfall losses	29.139	2.392	25.127	mm"
"	Runoff depth	52.082	78.828	56.094	mm"
"	Runoff volume	894.25	238.85	1133.10	c.m"
"	Runoff coefficient	0.641	0.971	0.691	"
"	Maximum flow	0.598	0.165	0.686	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.686	15.342	0.328	0.328"
" 54	POND DESIGN"				

"	15.342	Current peak flow	c.m/sec"
"	3.341	Target outflow	c.m/sec"
"	24346.9	Hydrograph volume	c.m"
"	18.	Number of stages"	
"	421.500	Minimum water level	metre"
"	423.200	Maximum water level	metre"
"	421.500	Starting water level	metre"
"	0	Keep Design Data: 1 = True; 0 = False"	
"		Level Discharge	Volume"
"	421.500	0.000	0.000"
"	421.600	0.00700	1070.100"
"	421.700	0.01300	2176.600"
"	421.800	0.01900	3319.800"
"	421.900	0.02300	4500.000"
"	422.000	0.02600	5717.200"
"	422.100	0.07100	6977.200"
"	422.200	0.1940	8275.500"
"	422.300	0.3520	9602.300"
"	422.400	0.3950	10957.80"
"	422.500	0.5140	12342.10"
"	422.600	0.7980	13755.30"
"	422.700	0.9580	15197.70"
"	422.800	1.614	16669.40"
"	422.900	2.846	18170.60"
"	423.000	4.482	19701.40"
"	423.100	6.460	21262.00"
"	423.200	8.746	22852.50"
"		Peak outflow	1.445 c.m/sec"
"		Maximum level	422.774 metre"
"		Maximum storage	16290.217 c.m"
"		Centroidal lag	17.909 hours"
"	0.686	15.342	1.445 0.328 c.m/sec"
" 40	HYDROGRAPH Next link "		
"	5	Next link "	
"	0.686	1.445	1.445 0.328"
" 33	CATCHMENT 4000"		
"	1	Triangular SCS"	
"	1	Equal length"	
"	2	Horton equation"	
"	4000	Catchment 4000"	
"	0.000	% Impervious"	
"	3.330	Total Area"	
"	120.000	Flow length"	
"	3.000	Overland Slope"	
"	3.330	Pervious Area"	
"	120.000	Pervious length"	
"	3.000	Pervious slope"	
"	0.000	Impervious Area"	
"	120.000	Impervious length"	
"	3.000	Impervious slope"	

"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.835	1.445	1.445	0.328 c.m/sec"
"		Catchment 4000	Pervious	Impervious	Total Area "
"		Surface Area	3.330	0.000	3.330 hectare"
"		Time of concentration	18.225	3.335	18.225 minutes"
"		Time to Centroid	135.263	114.631	135.263 minutes"
"		Rainfall depth	81.221	81.221	81.221 mm"
"		Rainfall volume	2704.65	0.00	2704.66 c.m"
"		Rainfall losses	28.982	3.311	28.982 mm"
"		Runoff depth	52.239	77.910	52.239 mm"
"		Runoff volume	1739.55	0.00	1739.55 c.m"
"		Runoff coefficient	0.643	0.000	0.643 "
"		Maximum flow	0.835	0.000	0.835 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.835	1.781	1.445	0.328"
" 33		CATCHMENT 3000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	3000	Catchment 3000"			
"	50.000	% Impervious"			
"	1.350	Total Area"			
"	20.000	Flow length"			
"	15.000	Overland Slope"			
"	0.675	Pervious Area"			
"	20.000	Pervious length"			
"	15.000	Pervious slope"			
"	0.675	Impervious Area"			
"	20.000	Impervious length"			
"	15.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			

"		0.665	1.781	1.445	0.328 c.m/sec"
"	Catchment 3000		Pervious	Impervious	Total Area "
"	Surface Area	0.675	0.675	1.350	hectare"
"	Time of concentration	3.838	0.702	1.967	minutes"
"	Time to Centroid	114.744	110.663	112.309	minutes"
"	Rainfall depth	81.221	81.221	81.221	mm"
"	Rainfall volume	548.24	548.24	1096.48	c.m"
"	Rainfall losses	30.089	5.611	17.850	mm"
"	Runoff depth	51.132	75.610	63.371	mm"
"	Runoff volume	345.14	510.37	855.51	c.m"
"	Runoff coefficient	0.630	0.931	0.780	"
"	Maximum flow	0.315	0.350	0.665	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.665	1.866	1.445	0.328"
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"		0.665	1.866	1.866	0.328"
" 40	HYDROGRAPH Combine 200"				
"	6 Combine "				
"	200 Node #"				
"	To Northeast Wetland"				
"	Maximum flow		1.866	c.m/sec"	
"	Hydrograph volume		22483.559	c.m"	
"		0.665	1.866	1.866	1.866"
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"		0.665	0.000	1.866	1.866"
" 33	CATCHMENT 7000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	7000 Catchment 7000"				
"	0.000 % Impervious"				
"	0.490 Total Area"				
"	7.500 Flow length"				
"	33.000 Overland Slope"				
"	0.490 Pervious Area"				
"	7.500 Pervious length"				
"	33.000 Pervious slope"				
"	0.000 Impervious Area"				
"	7.500 Impervious length"				
"	33.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				

"	0.000	Impervious Min.infiltration"			
"	0.001	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.261	0.000	1.866	1.866 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	1.682	0.308	1.682 minutes"
"		Time to Centroid	111.370	109.953	111.370 minutes"
"		Rainfall depth	81.221	81.221	81.221 mm"
"		Rainfall volume	397.98	0.00	397.98 c.m"
"		Rainfall losses	29.624	10.720	29.624 mm"
"		Runoff depth	51.597	70.501	51.597 mm"
"		Runoff volume	252.82	0.00	252.83 c.m"
"		Runoff coefficient	0.635	0.000	0.635 "
"		Maximum flow	0.261	0.000	0.261 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.261	0.261	1.866	1.866"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.261	0.261	0.261	1.866"
" 40		HYDROGRAPH Combine 300"			
"	6	Combine "			
"	300	Node #"			
"		To West Farm Field"			
"		Maximum flow	0.261	c.m/sec"	
"		Hydrograph volume	252.825	c.m"	
"		0.261	0.261	0.261	0.261"
" 40		HYDROGRAPH Confluence 100"			
"	7	Confluence "			
"	100	Node #"			
"		To Highway 6 Roadside Ditch"			
"		Maximum flow	0.328	c.m/sec"	
"		Hydrograph volume	361.624	c.m"	
"		0.261	0.328	0.261	0.000"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.261	0.328	0.328	0.000"
" 40		HYDROGRAPH Combine 200"			
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	1.906	c.m/sec"	
"		Hydrograph volume	22845.188	c.m"	
"		0.261	0.328	0.328	1.906"
" 40		HYDROGRAPH Confluence 200"			
"	7	Confluence "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	1.906	c.m/sec"	

"	Hydrograph volume	22845.186	c.m"
"	0.261 1.906 0.328	0.000"	
" 40	HYDROGRAPH Copy to Outflow"		
"	8 Copy to Outflow"		
"	0.261 1.906 1.906	0.000"	
" 40	HYDROGRAPH Combine 300"		
"	6 Combine "		
"	300 Node #"		
"	To West Farm Field"		
"	Maximum flow	1.932	c.m/sec"
"	Hydrograph volume	23098.012	c.m"
"	0.261 1.906 1.906	1.932"	
" 38	START/RE-START TOTALS 200"		
"	3 Runoff Totals on EXIT"		
"	Total Catchment area	39.420	hectare"
"	Total Impervious area	26.276	hectare"
"	Total % impervious	66.657"	
" 19	EXIT"		

```

"          MIDUSS Output ----->"
"          MIDUSS version                      Version 2.25  rev. 473"
"          MIDUSS created                      Sunday, February 7, 2010"
"          10  Units used:                      ie METRIC"
"          Job folder:                        B:\Working\POLOCORP INC\
"          2401807 - 422079 North Lands Hwy 6 Fergus\Design Phase\Design
Data\Modelling Files\Jan10_2025 - Copy"
"          Output filename:                      Post_REG.out"
"          Licensee name:                      "
"          Company                              "
"          Date & Time last used:                2/5/2025 at 11:23:53 AM"
" 31          TIME PARAMETERS"
"          60.000  Time Step"
"          2880.000  Max. Storm length"
"          7500.000  Max. Hydrograph"
" 32          STORM Historic"
"          5  Historic"
"          2880.000  Duration"
"          48.000  Rainfall intensity values"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.028      2.028      2.028      2.028"
"                  2.028      2.026      2.026      2.026      2.028"
"                  2.026      6.000      4.000      6.000      13.000"
"                  17.000      13.000      23.000      13.000      13.000"
"                  53.000      38.000      13.000"
"          Maximum intensity                    53.000      mm/hr"
"          Total depth                          285.000      mm"
"          6  000hyd  Hydrograph extension used in this file"
" 33          CATCHMENT 5000"
"          1  Triangular SCS"
"          1  Equal length"
"          2  Horton equation"
"          5000  Catchment 5000"
"          25.000  % Impervious"
"          0.120  Total Area"
"          55.000  Flow length"
"          3.000  Overland Slope"
"          0.090  Pervious Area"
"          55.000  Pervious length"
"          3.000  Pervious slope"
"          0.030  Impervious Area"
"          55.000  Impervious length"
"          3.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          30.000  Pervious Max.infiltration"
"          5.000  Pervious Min.infiltration"

```

"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.013	0.000	0.000	0.000 c.m/sec"
"		Catchment 5000	Pervious	Impervious	Total Area "
"		Surface Area	0.090	0.030	0.120 hectare"
"		Time of concentration	20.500	3.643	14.414 minutes"
"		Time to Centroid	2725.538	2237.026	2549.173 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	256.50	85.50	342.00 c.m"
"		Rainfall losses	139.608	38.558	114.346 mm"
"		Runoff depth	145.392	246.442	170.654 mm"
"		Runoff volume	130.85	73.93	204.79 c.m"
"		Runoff coefficient	0.510	0.865	0.599 "
"		Maximum flow	0.009	0.004	0.013 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.013	0.013	0.000	0.000"
" 33		CATCHMENT 6000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	6000	Catchment 6000"			
"	5.000	% Impervious"			
"	0.560	Total Area"			
"	5.000	Flow length"			
"	33.000	Overland Slope"			
"	0.532	Pervious Area"			
"	5.000	Pervious length"			
"	33.000	Pervious slope"			
"	0.028	Impervious Area"			
"	5.000	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			
"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.065	0.013	0.000	0.000 c.m/sec"
"		Catchment 6000	Pervious	Impervious	Total Area "
"		Surface Area	0.532	0.028	0.560 hectare"

"	Time of concentration	2.369	0.421	2.184	minutes"
"	Time to Centroid	2699.991	2271.479	2659.445	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	1516.20	79.80	1596.00	c.m"
"	Rainfall losses	157.980	32.780	151.720	mm"
"	Runoff depth	127.020	252.220	133.280	mm"
"	Runoff volume	675.75	70.62	746.37	c.m"
"	Runoff coefficient	0.446	0.885	0.468	"
"	Maximum flow	0.062	0.004	0.065	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"		0.065	0.078	0.000	0.000"
" 40	HYDROGRAPH Copy to Outflow"				
"	8 Copy to Outflow"				
"		0.065	0.078	0.078	0.000"
" 40	HYDROGRAPH Combine 100"				
"	6 Combine "				
"	100 Node #"				
"	To Highway 6 Roadside Ditch"				
"	Maximum flow		0.078		c.m/sec"
"	Hydrograph volume		951.152		c.m"
"		0.065	0.078	0.078	0.078"
" 40	HYDROGRAPH Start - New Tributary"				
"	2 Start - New Tributary"				
"		0.065	0.000	0.078	0.078"
" 33	CATCHMENT 1000"				
"	1 Triangular SCS"				
"	1 Equal length"				
"	2 Horton equation"				
"	1000 Catchment 1000"				
"	80.000 % Impervious"				
"	31.550 Total Area"				
"	45.000 Flow length"				
"	2.000 Overland Slope"				
"	6.310 Pervious Area"				
"	45.000 Pervious length"				
"	2.000 Pervious slope"				
"	25.240 Impervious Area"				
"	45.000 Impervious length"				
"	2.000 Impervious slope"				
"	0.250 Pervious Manning 'n'"				
"	30.000 Pervious Max.infiltration"				
"	5.000 Pervious Min.infiltration"				
"	0.250 Pervious Lag constant (hours)"				
"	5.000 Pervious Depression storage"				
"	0.015 Impervious Manning 'n'"				
"	0.000 Impervious Max.infiltration"				
"	0.000 Impervious Min.infiltration"				
"	0.010 Impervious Lag constant (hours)"				
"	1.500 Impervious Depression storage"				

"	3.800	0.000	0.078	0.078 c.m/sec"	
"	Catchment 1000	Pervious	Impervious	Total Area	"
"	Surface Area	6.310	25.240	31.550	hectare"
"	Time of concentration	20.526	3.647	5.817	minutes"
"	Time to Centroid	2725.564	2236.987	2299.778	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	1.7983	7.1934	8.9917	ha-m"
"	Rainfall losses	139.615	38.537	58.753	mm"
"	Runoff depth	145.385	246.463	226.247	mm"
"	Runoff volume	0.9174	6.2207	7.1381	ha-m"
"	Runoff coefficient	0.510	0.865	0.794	"
"	Maximum flow	0.644	3.182	3.800	c.m/sec"

" 40 HYDROGRAPH Add Runoff "

"	4	Add Runoff "			
"	3.800	3.800	0.078	0.078"	

" 33	CATCHMENT 2000"			
"	1	Triangular SCS"		
"	1	Equal length"		
"	2	Horton equation"		
"	2000	Catchment 2000"		
"	15.000	% Impervious"		
"	2.020	Total Area"		
"	40.000	Flow length"		
"	2.000	Overland Slope"		
"	1.717	Pervious Area"		
"	40.000	Pervious length"		
"	2.000	Pervious slope"		
"	0.303	Impervious Area"		
"	40.000	Impervious length"		
"	2.000	Impervious slope"		
"	0.250	Pervious Manning 'n' "		
"	30.000	Pervious Max.infiltration"		
"	5.000	Pervious Min.infiltration"		
"	0.250	Pervious Lag constant (hours)"		
"	5.000	Pervious Depression storage"		
"	0.015	Impervious Manning 'n' "		
"	0.000	Impervious Max.infiltration"		
"	0.000	Impervious Min.infiltration"		
"	0.010	Impervious Lag constant (hours)"		
"	1.500	Impervious Depression storage"		

"	0.210	3.800	0.078	0.078 c.m/sec"	
"	Catchment 2000	Pervious	Impervious	Total Area	"
"	Surface Area	1.717	0.303	2.020	hectare"
"	Time of concentration	19.125	3.398	15.514	minutes"
"	Time to Centroid	2724.073	2240.650	2613.063	minutes"
"	Rainfall depth	285.000	285.000	285.000	mm"
"	Rainfall volume	4893.45	863.55	5757.00	c.m"
"	Rainfall losses	139.363	39.000	124.309	mm"
"	Runoff depth	145.637	246.000	160.691	mm"
"	Runoff volume	2500.58	745.38	3245.96	c.m"

"	Runoff coefficient	0.511	0.863	0.564	"
"	Maximum flow	0.173	0.038	0.210	c.m/sec"
" 40	HYDROGRAPH Add Runoff "				
"	4 Add Runoff "				
"	0.210	4.009	0.078	0.078"	
" 54	POND DESIGN"				
"	4.009	Current peak flow	c.m/sec"		
"	3.341	Target outflow	c.m/sec"		
"	74626.9	Hydrograph volume	c.m"		
"	18.	Number of stages"			
"	421.500	Minimum water level	metre"		
"	423.200	Maximum water level	metre"		
"	421.500	Starting water level	metre"		
"	0	Keep Design Data: 1 = True; 0 = False"			
"	Level Discharge	Volume"			
"	421.500	0.000	0.000"		
"	421.600	0.00700	1070.100"		
"	421.700	0.01300	2176.600"		
"	421.800	0.01900	3319.800"		
"	421.900	0.02300	4500.000"		
"	422.000	0.02600	5717.200"		
"	422.100	0.07100	6977.200"		
"	422.200	0.1940	8275.500"		
"	422.300	0.3520	9602.300"		
"	422.400	0.3950	10957.80"		
"	422.500	0.5140	12342.10"		
"	422.600	0.7980	13755.30"		
"	422.700	0.9580	15197.70"		
"	422.800	1.614	16669.40"		
"	422.900	2.846	18170.60"		
"	423.000	4.482	19701.40"		
"	423.100	6.460	21262.00"		
"	423.200	8.746	22852.50"		
"	Peak outflow	3.326	c.m/sec"		
"	Maximum level	422.950	metre"		
"	Maximum storage	18928.572	c.m"		
"	Centroidal lag	48.750	hours"		
"	0.210	4.009	3.326	0.078 c.m/sec"	
" 40	HYDROGRAPH Next link "				
"	5 Next link "				
"	0.210	3.326	3.326	0.078"	
" 33	CATCHMENT 4000"				
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	4000	Catchment 4000"			
"	0.000	% Impervious"			
"	3.330	Total Area"			
"	120.000	Flow length"			
"	3.000	Overland Slope"			

"	3.330	Pervious Area"
"	120.000	Pervious length"
"	3.000	Pervious slope"
"	0.000	Impervious Area"
"	120.000	Impervious length"
"	3.000	Impervious slope"
"	0.250	Pervious Manning 'n'"
"	30.000	Pervious Max.infiltration"
"	5.000	Pervious Min.infiltration"
"	0.250	Pervious Lag constant (hours)"
"	5.000	Pervious Depression storage"
"	0.015	Impervious Manning 'n'"
"	0.000	Impervious Max.infiltration"
"	0.000	Impervious Min.infiltration"
"	0.010	Impervious Lag constant (hours)"
"	1.500	Impervious Depression storage"
"	0.366	3.326 3.326 0.078 c.m/sec"
"	Catchment 4000	Pervious Impervious Total Area "
"	Surface Area	3.330 0.000 3.330 hectare"
"	Time of concentration	32.738 5.817 32.738 minutes"
"	Time to Centroid	2737.685 2233.111 2737.684 minutes"
"	Rainfall depth	285.000 285.000 285.000 mm"
"	Rainfall volume	9490.49 0.01 9490.50 c.m"
"	Rainfall losses	139.700 29.327 139.699 mm"
"	Runoff depth	145.300 255.673 145.301 mm"
"	Runoff volume	4838.50 0.01 4838.51 c.m"
"	Runoff coefficient	0.510 0.000 0.510 "
"	Maximum flow	0.366 0.000 0.366 c.m/sec"
" 40	HYDROGRAPH Add Runoff "	
"	4 Add Runoff "	
"	0.366	3.692 3.326 0.078"
" 33	CATCHMENT 3000"	
"	1 Triangular SCS"	
"	1 Equal length"	
"	2 Horton equation"	
"	3000 Catchment 3000"	
"	50.000 % Impervious"	
"	1.350 Total Area"	
"	20.000 Flow length"	
"	15.000 Overland Slope"	
"	0.675 Pervious Area"	
"	20.000 Pervious length"	
"	15.000 Pervious slope"	
"	0.675 Impervious Area"	
"	20.000 Impervious length"	
"	15.000 Impervious slope"	
"	0.250 Pervious Manning 'n'"	
"	30.000 Pervious Max.infiltration"	
"	5.000 Pervious Min.infiltration"	
"	0.250 Pervious Lag constant (hours)"	

"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.165	3.692	3.326	0.078 c.m/sec"
"		Catchment 3000	Pervious	Impervious	Total Area "
"		Surface Area	0.675	0.675	1.350 hectare"
"		Time of concentration	6.894	1.225	3.197 minutes"
"		Time to Centroid	2702.037	2279.380	2426.416 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	1923.75	1923.75	3847.50 c.m"
"		Rainfall losses	153.479	38.462	95.970 mm"
"		Runoff depth	131.521	246.538	189.030 mm"
"		Runoff volume	887.77	1664.13	2551.90 c.m"
"		Runoff coefficient	0.461	0.865	0.663 "
"		Maximum flow	0.077	0.088	0.165 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.165	3.807	3.326	0.078"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.165	3.807	3.807	0.078"
" 40		HYDROGRAPH Combine 200"			
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	3.807		c.m/sec"
"		Hydrograph volume	80205.555		c.m"
"		0.165	3.807	3.807	3.807"
" 40		HYDROGRAPH Start - New Tributary"			
"	2	Start - New Tributary"			
"		0.165	0.000	3.807	3.807"
" 33		CATCHMENT 7000"			
"	1	Triangular SCS"			
"	1	Equal length"			
"	2	Horton equation"			
"	7000	Catchment 7000"			
"	0.000	% Impervious"			
"	0.490	Total Area"			
"	7.500	Flow length"			
"	33.000	Overland Slope"			
"	0.490	Pervious Area"			
"	7.500	Pervious length"			
"	33.000	Pervious slope"			
"	0.000	Impervious Area"			
"	7.500	Impervious length"			
"	33.000	Impervious slope"			
"	0.250	Pervious Manning 'n'"			

"	30.000	Pervious Max.infiltration"			
"	5.000	Pervious Min.infiltration"			
"	0.250	Pervious Lag constant (hours)"			
"	5.000	Pervious Depression storage"			
"	0.015	Impervious Manning 'n'"			
"	0.000	Impervious Max.infiltration"			
"	0.000	Impervious Min.infiltration"			
"	0.010	Impervious Lag constant (hours)"			
"	1.500	Impervious Depression storage"			
"		0.056	0.000	3.807	3.807 c.m/sec"
"		Catchment 7000	Pervious	Impervious	Total Area "
"		Surface Area	0.490	0.000	0.490 hectare"
"		Time of concentration	3.021	0.537	3.021 minutes"
"		Time to Centroid	2699.929	2272.615	2699.928 minutes"
"		Rainfall depth	285.000	285.000	285.000 mm"
"		Rainfall volume	1396.50	0.00	1396.50 c.m"
"		Rainfall losses	159.495	33.595	159.495 mm"
"		Runoff depth	125.505	251.405	125.505 mm"
"		Runoff volume	614.98	0.00	614.98 c.m"
"		Runoff coefficient	0.440	0.000	0.440 "
"		Maximum flow	0.056	0.000	0.056 c.m/sec"
" 40		HYDROGRAPH Add Runoff "			
"	4	Add Runoff "			
"		0.056	0.056	3.807	3.807"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.056	0.056	0.056	3.807"
" 40		HYDROGRAPH Combine	300"		
"	6	Combine "			
"	300	Node #"			
"		To West Farm Field"			
"		Maximum flow	0.056		c.m/sec"
"		Hydrograph volume	614.977		c.m"
"		0.056	0.056	0.056	0.056"
" 40		HYDROGRAPH Confluence	100"		
"	7	Confluence "			
"	100	Node #"			
"		To Highway 6 Roadside Ditch"			
"		Maximum flow	0.078		c.m/sec"
"		Hydrograph volume	951.152		c.m"
"		0.056	0.078	0.056	0.000"
" 40		HYDROGRAPH Copy to Outflow"			
"	8	Copy to Outflow"			
"		0.056	0.078	0.078	0.000"
" 40		HYDROGRAPH Combine	200"		
"	6	Combine "			
"	200	Node #"			
"		To Northeast Wetland"			
"		Maximum flow	3.863		c.m/sec"
"		Hydrograph volume	81156.703		c.m"

"		0.056	0.078	0.078	3.863"	
" 40	HYDROGRAPH	Confluence	200"			
"	7	Confluence "				
"	200	Node #"				
"		To Northeast Wetland"				
"		Maximum flow	3.863		c.m/sec"	
"		Hydrograph volume	81156.703		c.m"	
"		0.056	3.863	0.078	0.000"	
" 40	HYDROGRAPH	Copy to Outflow"				
"	8	Copy to Outflow"				
"		0.056	3.863	3.863	0.000"	
" 40	HYDROGRAPH	Combine	300"			
"	6	Combine "				
"	300	Node #"				
"		To West Farm Field"				
"		Maximum flow	3.902		c.m/sec"	
"		Hydrograph volume	81771.688		c.m"	
"		0.056	3.863	3.863	3.902"	
" 38	START/RE-START TOTALS	200"				
"	3	Runoff Totals on EXIT"				
"		Total Catchment area			39.420	hectare"
"		Total Impervious area			26.276	hectare"
"		Total % impervious			66.657"	
" 19	EXIT"					

Appendix D Water Balance Analysis

South Lands Subdivision
Township of Centre Wellington (Fergus)
Monthly Water Balance (Thornthwaite and Mather Method)
Date: February 2025

Table No. 21: Pre-Development Recharge Volume Summary

Catchment	Area	Imperv. (%)	Recharge Depth (mm/yr)	Recharge Volume (m³/yr)
40	3.33	0	328	10922.4
Portion of 30	0.26	5	287	708.89
Portion of 10	15.8	5	308	46230.8
				57,862.09

South Lands Subdivision
Township of Centre Wellington (Fergus)
Monthly Water Balance (Thornthwaite and Mather Method)
Date: February 2025

Table No. 22: Recharge Volume Summary

Catchment	Area	Imperv. (%)	Recharge Depth	Recharge Volume
100	13.09 ha	80	308 mm/yr	8,063 m ³ /yr
200	2.02 ha	15	308 mm/yr	5,288 m ³ /yr
300	1.35 ha	50	308 mm/yr	2,079 m ³ /yr
400	3.33 ha	0	328 mm/yr	10,922 m ³ /yr
600	0.12 ha	5	213 mm/yr	243 m ³ /yr
				26,596 m ³ /yr
Enhanced Infiltration from Infiltration Galleries				33,160 m ³ /yr
				59,756 m³/yr

103% of 57,862 m³/yr required as per
Hydrogeological Investigation

Table 23: Rooftop (100% Impervious)

Contributing Catchments: Rooftops	Soil Type: Fine Sand	Impervious Area = 0.19 ha	Percent of Total Area 100%	Runoff Factor = 1.00
Contributing Area = 0.19 ha	Vegetation: Shallow-rooted crops	Pervious Area = 0.00 ha	0%	
Percent Impervious = 100%	Root Zone Depth = 0.50m	Total Area = 0.19 ha	100%	Evapotranspiration Factor for Impervious Surfaces = 0.34
	Soil Moisture Retention Capacity = 75mm			

Month	Daily Average Temperature	Monthly Heat Index	Unadjusted Daily Potential Evapotranspiration	Correction Factors	Adjusted Potential Evapotranspiration	Average Precipitation	P-PE	Accum. Pot. Water Loss	Storage	ΔS	Pervious ET	Actual Evapotranspiration	Pervious ET - Actual ET	Moisture Deficit	Moisture Surplus	Water Runoff	Snow Melt Runoff	Total Recharge & Runoff	Actual Runoff
	(°C)		(mm)		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
Jan	-7.4	0.0	0.0	24.3	0.0	67.9	67.9		211.5	0.0	0.0	0.0	0.0	0.0	0.0	18.2	0.0	18.2	18.2
Feb	-6.3	0.0	0.0	24.5	0.0	55.9	55.9		267.4	0.0	0.0	0.0	0.0	0.0	0.0	9.1	0.0	9.1	9.1
Mar	-1.9	0.0	0.0	30.6	0.0	59.6	59.6		327.0	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.0	4.5	4.5
Apr	5.7	1.2	0.9	33.6	29.2	74.1	44.9		75.0	0.0	29.2	9.8	19.4	19.4	64.3	34.4	25.2	59.6	59.6
May	12.2	3.9	1.9	37.9	72.4	86.9	14.5		75.0	0.0	72.4	24.4	48.0	48.0	62.5	48.5	113.4	161.9	161.9
Jun	17.5	6.7	2.8	38.5	107.0	83.8	-23.2	-23.2	54.0	-21.0	104.8	35.3	69.5	71.7	69.5	59.0	56.7	115.7	115.7
Jul	20.0	8.2	3.2	38.8	124.2	89.2	-35.0	-58.2	46.0	-8.0	97.2	32.7	64.5	91.4	64.5	61.7	28.4	90.1	90.1
Aug	19.0	7.6	3.0	36.0	109.1	96.6	-12.5	-70.7	28.0	-18.0	114.6	38.6	76.0	70.5	76.0	68.9	14.2	83.0	83.0
Sep	14.9	5.2	2.4	31.2	73.3	93.1	19.8		47.8	19.8	73.3	24.7	48.6	48.6	48.6	58.8	7.5	66.3	66.3
Oct	8.3	2.2	1.3	28.5	36.5	77.2	40.7		88.5	40.7	36.5	12.3	24.2	24.2	24.2	41.5	3.9	45.4	45.4
Nov	2.1	0.3	0.3	24.2	7.5	93.0	85.5		75.0	-13.5	7.5	2.5	5.0	5.0	104.0	72.7	2.0	74.7	74.7
Dec	-3.9	0.0	0.0	23.0	0.0	68.6	68.6		143.6	0.0	0.0	0.0	0.0	0.0	0.0	36.4	0.8	37.2	37.2
Total		35.1				945.9	386.7					535.5	180.3	355.2	378.9	513.6	513.6	252.0	765.5

Notes: Precipitation and Temperature data from Environment Canada Climate Normals 1981-2010 for the Orangeville Weather Station
Monthly water balance strategy as outlined in the document *Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance (Thorntwaite and Mather, 1957)*
Evaporation Factor for Impervious Surfaces = Average Annual Evapotranspiration for Impervious Surfaces (180.3mm/year) / Average Annual Evapotranspiration for Pervious Surfaces (535.5mm/year) = 0.34
Runoff Factor = [(Impervious Percentage of Site x Average Annual Runoff for Impervious Surfaces (765.6mm/year)) + (Pervious Percentage of Site x Average Annual Runoff for Pervious Surfaces (123 mm/year))]/ Total Annual Recharge & Runoff

**South Lands Subdivision
Township of Centre Wellington (Fergus)
File No: 422079**

Table 24: Infiltration Gallery Sizing Calculation

Runoff Depth = 25 mm							Infiltration Gallery					
Type of Lot	Number of Units	Building Width (m)	Building Length (m)	Rooftop Area (m ²)	Required Storage Volume Per Lot (m ³)	Total Storage Volume Required (m ³)	Length (m)	Width (m)	Depth (m)	Stone Volume (m ³)	Storage Volume (m ³)	Total Storage Volume Provided (m ³)
Single Detached (11m - 15.2m lots)	88	9.20	17.00	156.40	3.91	344.08	7.50	1.6	1	12.00	4.00	352.00
Street Townhouse (5.5m - 7m units)	118	5.00	17.00	42.50	1.06	125.38	3.25	1	1	3.25	1.08	127.83
Mixed Use and Medium Density Blocks				1,670.00		41.75	125.00	1	1	125.00	41.67	41.67
Total	206			1,868.90		511.21						521.50

Notes:

- 1.0 Assumes the following lot setbacks:
- 2.0 Assumes stone void ratio of 1/3
- 3.0 Infiltration Galleries sized to infiltrate 25mm design storm event from building rooftops.
- 4.0 For townhome units, it is assumed that only half of the rooftop area can be infiltrated.
- 5.0 Assumes Multiple Residential Block rooftop area to be infiltrated is 25% of block area

Table 25: Enhanced Recharge Calculation - Single Detached Houses

Structure Length =	7.50	m	Gallery Footprint =	12.00	m ²
Structure Width =	1.60	m			
Structure Depth =	1.00	m			
			Volume of Stone =	12.00	m ³
			Stone Porosity =	0.33	
			Storage Volume of Stone =	4.00	m³

Draindown time calculated using the BMP Sizing equation from the Low Impact Development Stormwater Management Planning and Design Guide

$$d_{rmax} = i * t_s / V_r$$

d_{rmax} = depth of stone = 1000.00 mm
 i = infiltration rate for native soils = 15.00 mm/hr
 V_r = void space ratio for aggregate used = 0.33
 t_s = time to drain, solve for t_s

$$t_s = d_{rmax} * V_r / i = 22.00 \text{ hours or } 0.92 \text{ day draindown period}$$

Building Rooftops

Number of Lots =	207	
Rooftop Area (per lot)=	156.40 m ²	0.0156 ha
Total Rooftop Area	3.237 ha	Rooftop Area (ha) x Number of Lots
Recharge Time	22.00 hours	/ 0.92 days
Recharge Volume Potential =	4.00 m ³	(per lot)
Total Recharge Volume Potential =	828.00 m ³	(Recharge Volume Potential x Number of Lots)

Month	Total Runoff (mm)	No. of days	Max Potential Recharge (m ³)	Total Available Recharge (m ³)	Total Enhanced Recharge (m ³)	Available Recharge per Lot (m ³)	Enhanced Recharge per Lot (m ³)
Jan	18.2	31	28,001	589	500	2.8	2.4
Feb	9.1	28	25,292	294	250	1.4	1.2
Mar	4.5	31	28,001	147	125	0.7	0.6
Apr	59.6	30	27,098	1,929	1,640	9.3	7.9
May	161.9	31	28,001	5,240	4,454	25.3	21.5
Jun	115.7	30	27,098	3,745	3,183	18.1	15.4
Jul	90.1	31	28,001	2,916	2,479	14.1	12.0
Aug	83.0	31	28,001	2,689	2,285	13.0	11.0
Sep	66.3	30	27,098	2,145	1,823	10.4	8.8
Oct	45.4	31	28,001	1,469	1,249	7.1	6.0
Nov	74.7	30	27,098	2,418	2,055	11.7	9.9
Dec	37.2	31	28,001	1,203	1,023	5.8	4.9
Total	765.5	365	329,695	24,784	21,066	119.7	101.8

Note: Infiltration Galleries are sized for the 25mm design storm event. It is assumed that 85% of storm events are 25mm or less. Enhanced recharge is taken as 85% of the available recharge to represent the 25mm storm infiltration.

Table 26: Enhanced Recharge Calculation - Townhome Blocks

Structure Length =	3.00	m	Gallery Footprint =	3.00	m ²
Structure Width =	1.00	m			
Structure Depth =	1.00	m			
			Volume of Stone =	3.00	m ³
			Stone Porosity =	0.33	
			Storage Volume of Stone =	1.00	m³

Draindown time calculated using the BMP Sizing equation from the Low Impact Development Stormwater Management Planning and Design Guide

$d_{rmax} = i * t_s / V_r$		
d_{rmax} = depth of stone =	1000.00	mm
i = infiltration rate for native soils =	15.00	mm/hr
V_r = void space ratio for aggregate used =	0.33	
t_s = time to drain, solve for t_s		
$t_s = d_{rmax} * V_r / i =$	22.00 hours or	0.92 day draindown period

Building Rooftops

Number of Lots =	398	
Rooftop Area (per lot)=	42.50 m ²	0.0043 ha
Total Rooftop Area	1.692 ha	Rooftop Area (ha) x Number of Lots
Recharge Time	22.00 hours	/ 0.92 days
Recharge Volume Potential =	1.00 m ³	(per lot)
Total Recharge Volume Potential =	398.00 m ³	(Recharge Volume Potential x Number of Lots)

Month	Total Runoff (mm)	No. of days	Max Potential Recharge (m ³)	Available Recharge (m ³)	Enhanced Recharge (m ³)
Jan	18.2	31	13,460	308	261
Feb	9.1	28	12,157	154	131
Mar	4.5	31	13,460	77	65
Apr	59.6	30	13,025	1,008	857
May	161.9	31	13,460	2,738	2,327
Jun	115.7	30	13,025	1,957	1,663
Jul	90.1	31	13,460	1,524	1,295
Aug	83.0	31	13,460	1,405	1,194
Sep	66.3	30	13,025	1,121	953
Oct	45.4	31	13,460	768	652
Nov	74.7	30	13,025	1,263	1,074
Dec	37.2	31	13,460	629	534
Total	765.5	365	158,476	12,949	11,007

Notes:

- 1.0 Rooftop area for townhome units is taken as half of the building roof area (assumes only rear half of roof is infiltrated)
2.0 Note: Infiltration Galleries are sized for the 25mm design storm event. It is assumed that 85% of storm events are 25mm or less. Enhanced recharge is taken as 85% of the available recharge to represent the 25mm storm infiltration.

Table 27: Enhanced Recharge Calculation - Medium Density/ Mixed Use Blocks

Structure Length =	125.00	m	Gallery Footprint =	125.00	m ²
Structure Width =	1.00	m			
Structure Depth =	1.00	m			
			Volume of Stone =	125.00	m ³
			Stone Porosity =	0.33	
			Storage Volume of Stone =	41.67	m³

Draindown time calculated using the BMP Sizing equation from the Low Impact Development Stormwater Management Planning and Design Guide

$d_{rmax} = i * t_s / V_r$		
d_{rmax} = depth of stone =	1000.00	mm
i = infiltration rate for native soils =	15.00	mm/hr
V_r = void space ratio for aggregate used =	0.33	
t_s = time to drain, solve for t_s		
$t_s = d_{rmax} * V_r / i =$	22.00 hours or	0.92 day draindown period

Building Rooftops

Total Rooftop Area	0.167 ha	Rooftop Area (ha) x Number of Lots
Recharge Time	22.00 hours /	0.92 days
Recharge Volume Potential =	41.67 m ³	(per lot)

Month	Total Runoff (mm)	No. of days	Max Potential Recharge (m ³)	Available Recharge (m ³)	Enhanced Recharge (m ³)
Jan	18.2	31	1,409	30	26
Feb	9.1	28	1,273	15	13
Mar	4.5	31	1,409	8	6
Apr	59.6	30	1,364	99	85
May	161.9	31	1,409	270	230
Jun	115.7	30	1,364	193	164
Jul	90.1	31	1,409	150	128
Aug	83.0	31	1,409	139	118
Sep	66.3	30	1,364	111	94
Oct	45.4	31	1,409	76	64
Nov	74.7	30	1,364	125	106
Dec	37.2	31	1,409	62	53
Total	765.5	365	16,591	1,278	1,087

Notes:

- 1.0 Assumes Multiple Residential Block rooftop area to be infiltrated is 25% of block area
- 2.0 Infiltration Galleries are sized for the 25mm design storm event. It is assumed that 85% of storm events are 25mm or less. Enhanced recharge is taken as 85% of the available recharge to represent the 25mm storm infiltration.