FINAL

Phase One Environmental Site Assessment

2275 Mer Bleue Road
Ottawa, Ontario

Prepared for:

Broadstreet Properties Ltd.
100 St. Ann's Road
Campbell River, BC V9W 4C4

May 9, 2023

Pinchin File: 325586

© 2023 Pinchin Ltd.

Issued To:	**Broadstreet Properties Ltd.**
Issued On:	**May 9, 2023**
Pinchin File:	**325586**
Issuing Office:	**Kanata, ON**

Author:
Alex Kelly, B.Sc.
Project Technologist
613.223.0668
akelly@pinchin.com

Reviewer:
Scott Mather, P.Eng., QP$_{ESA}$
Director, Eastern Ontario
613.851.4098
smather@pinchin.com

© 2023 Pinchin Ltd.

TABLE OF CONTENTS

© 2023 Pinchin Ltd.

© 2023 Pinchin Ltd.

APPENDICES

FIGURES

© 2023 Pinchin Ltd.

1.0 EXECUTIVE SUMMARY

Pinchin Ltd. (Pinchin) was retained by Broadstreet Properties Ltd. (Client) to complete a Phase One Environmental Site Assessment (Phase One ESA) of the property located at 2275 Mer Bleue Road in Ottawa, Ontario (hereafter referred to as the Site or Phase One Property). The Phase One Property is approximately 8.8 acres in size and presently consists of vacant undeveloped land.

Pinchin conducted this Phase One ESA in accordance with Part VII and Schedule D of the Province of Ontario's *Environmental Protection Act R.S.O. 1990, c. E.19* and *Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act*, and last amended by Ontario Regulation 274/20 on July 1, 2020 (O. Reg. 153/04). The purpose of the Phase One ESA was to assess the potential presence of environmental impacts at the Phase One Property due to activities at and near the Phase One Property.

This Phase One ESA was conducted at the request of the Client as a condition for a Site Plan Approval application with the City of Ottawa.

The scope of work for this Phase One ESA was consistent with O. Reg. 153/04 in support of filing a Site Plan Approval application and was comprised of the following:

- A Records Review: Reviewed available current and historical information sources pertaining to the Phase One Property and Phase One Study Area including the use of, but not limited to, aerial photographs, city directories, Environmental Risk Information System (ERIS) regulatory search and a regulatory database search. Regulatory agencies were also contacted to identify if any records of environmental non-compliance or other information associated with the environmental condition of the Phase One Property exists, including a search of Ministry of the Environment, Conservation and Parks records;
- Interviews: Site information was gathered via email correspondence with a Site Representative (see Section 5.0) to determine if any current or historical operations have caused a concern with respect to the environmental condition of the Phase One Property and the surrounding properties within the Phase One Study Area;
- Site Reconnaissance: Completed a visual assessment of the Phase One Property and the surrounding properties within the Phase One Study Area (from publicly-accessible areas) including any associated buildings and/or facilities for the purpose of identifying the presence of potentially contaminating activities (PCAs);
- Evaluation: Evaluated the information gathered from the records review, interviews and Site reconnaissance;
- Reporting: Prepared a Phase One ESA report; and

© 2023 Pinchin Ltd.

- Submission: Submitted the Phase One ESA report to the Client.

The Phase One Property consists of one legal lot situated at the municipal addresses of 2275 Mer Bleue Road, Ottawa, Ontario and is currently owned by Broadstreet Properties Ltd. The Phase One Property is located immediately east of Mer Bleue Road, approximately 265 metres (m) southwest of the intersection of Brian Coburn Boulevard East, Jerome Jodoin Drive and Gerry Lalonde Drive, in Ottawa, Ontario.

A review of the aerial photographs indicated that the Phase One Property has not been developed with any buildings and/or permanent structures. The 1952 aerial photograph indicated that the forested area throughout the Phase One Property had been removed for the land to be used for agricultural purposes.

It is Pinchin's opinion that the date of the first use of the Phase One Property is prior to 1952, with the removal of the forested area on the Phase One Property. The date of the first developed use of the Phase One Property was determined through a review of aerial photographs. No other historical records were available to Pinchin that provided information for determining the date of first developed use of the Phase One Property.

Based on the findings of this Phase One ESA, Pinchin did not identify any PCAs at the Phase One Property. Seven PCAs were identified within the Phase One Study Area:

- An automotive repair/servicing facility has been located approximately 70 m southeast of the Phase One Property since 1995; and
- A total of one pole-mounted and five pad-mounted oil-cooled transformers are located within 250 m of the Phase One Property.

However, no evidence of spills or historical spills (i.e., staining) observed in the vicinity of the transformers and no issues of potential environmental concern (i.e., spills) were noted for the transformers within the ERIS report and any maintenance/environmental issues associated with the transformers would be the responsibility of Hydro One. Based on the above-noted information; the distance between these properties and the Phase One property and the inferred groundwater flow direction, it is Pinchin's opinion that these PCAs do not represent APECs for the Phase One Property. Based on these findings, nothing was identified that is likely to have resulted in impacts to the soil and/or groundwater at the Phase One Property and would require the completion of a Phase Two ESA. As such, it is Pinchin's opinion that the Phase One Property is suitable for the purpose of filing a Site Plan Approval with the City of Ottawa based only on the completion of this Phase One ESA report.

It should be noted that the references and sources for the information used in evaluating the Phase One Property are provided in the relevant sections of this report. Specific references are also summarized in Section 9.0

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.

© 2023 Pinchin Ltd.

2.0 INTRODUCTION

A Phase One ESA is defined as a systematic qualitative process to determine whether a particular property is, or may be subject to, actual or potential contamination. Under the Province of Ontario's *Environmental Protection Act R.S.O. 1990, c. E.19* (EPA) and *Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act*, and last amended by Ontario Regulation 274/20 on July 1, 2020 (O. Reg. 153/04), the purpose of a Phase One ESA is two-fold:

- To obtain and review records that relate to the Phase One Property, and to the current and past uses of and activities at or affecting the Phase One Property, in order to determine if an area of potential environmental concern (APEC) exists and to interpret any APEC; and
- To obtain and review records that relate to properties in the Phase One Study Area, other than the Phase One Property, in order to determine if a potentially contaminating activity (PCA) exists and interpret whether any such PCA results in an APEC at the Phase One Property.

This Phase One ESA was conducted at the request of the Client as a condition for a Site Plan Approval application with the City of Ottawa.

A Phase One ESA does not include sampling or testing of environmental media or building materials. The study period for this assessment was April and May 2023, which included the records review, Site reconnaissance, interviews and reporting.

2.1 Phase One Property Information

The Phase One Property consists of one legal lot situated at the municipal addresses of 2275 Mer Bleue Road, Ottawa, Ontario and is currently owned by Broadstreet Properties Ltd. The Phase One Property is located immediately east of Mer Bleue Road, approximately 265 metres (m) southwest of the intersection of Brian Coburn Boulevard East, Jerome Jodoin Drive and Gerry Lalonde Drive, in Ottawa, Ontario, as shown on Figure 1 (all Figures are provided in Appendix A and all appendices are provided in Section 10.0). A plan showing the Phase One Property is provided as Figure 2. PCAs identified within the Phase One Study Area are depicted on Figure 3. Photographs of the Phase One Property and surrounding properties are presented in Appendix B.

© 2023 Pinchin Ltd.

Pertinent details of the Phase One Property are provided in the following table:

Detail	Source / Reference	Information
Legal Description	N/A	N/A
Municipal Addresses	Client	2275 Mer Bleue Road, Ottawa, ON
Parcel Identification Number (PIN)	N/A	N/A
Current Owner	Client	Broadstreet Properties Ltd.
Current Occupants	Vacant	Vacant undeveloped land
Client	Authorization to Proceed, Limitation of Liability & Terms of Engagement Form	Broadstreet Properties Ltd.
Client Contact Information	Authorization to Proceed, Limitation of Liability & Terms of Engagement Form	Josh Samson c/o Broadstreet Properties Ltd. 100 St. Ann's Road Campbell River, BC V9W 4C4
Site Area	Site Representative	3.6 hectares (8.8 acres)
Legal Description	N/A	N/A

3.0 SCOPE OF INVESTIGATION

Pinchin conducted this Phase One ESA in accordance with O. Reg. 153/04, in particular Part VII and Schedule D of O. Reg. 153/04. The Phase One ESA scope of work was comprised of the following:

- A Records Review: Reviewed available current and historical information sources pertaining to the Phase One Property and Phase One Study Area including the use of, but not limited to, aerial photographs, city directories, Environmental Risk Information System (ERIS) regulatory search and a regulatory database search. Regulatory agencies were also contacted to identify if any records of environmental non-compliance or other information associated with the environmental condition of the Phase One Property exists, including a search of Ministry of the Environment, Conservation and Parks (MECP);
- Interviews: Site information was gathered via email correspondence with a Site Representative (see Section 5.0) to determine if any current or historical operations have caused a concern with respect to the environmental condition of the Phase One Property and the surrounding properties within the Phase One Study Area;

© 2023 Pinchin Ltd.

- Site Reconnaissance: Completed a visual assessment of the Phase One Property and the surrounding properties within the Phase One Study Area (from publicly-accessible areas) including any associated buildings and/or facilities for the purpose of identifying the presence of PCAs;
- Evaluation: Evaluated the information gathered from the records review, interviews and Site reconnaissance;
- Reporting: Prepared a Phase One ESA report; and
- Submission: Submitted the Phase One ESA report to the Client.

4.0 RECORDS REVIEW

4.1 General

The identified off-Site PCAs described in this and subsequent report Sections is depicted on Figure 3.

A Phase One ESA does not include sampling or testing of environmental media or building materials. The study period for this assessment was April and May 2023, which included the records review, Site reconnaissance, interviews and reporting. A Site reconnaissance was completed on April 20, 2023, by a Pinchin representative under the direct supervision of a Qualified Person (QP). During the Site reconnaissance, Pinchin accessed all exterior areas of the Phase One Property. Pinchin did not access any areas within the surrounding Phase One Study Area with the exception of publicly-accessible roads and sidewalks. Select photographs taken during the Site reconnaissance of the Phase One Property and the surrounding properties within the Phase One Study Area are presented in Appendix B.

4.1.1 Phase One Study Area Determination

Based on a review of the available historical information and observations made during the Site reconnaissance for the properties greater than 250 m, but less than 1 kilometre (km), from the Phase One Property boundary, Pinchin did not note or observe any significant potentially contaminating properties that should be included as part of this assessment (e.g., landfills, large industrial manufacturers, etc.). As such, the Phase One Study Area consisted of the Phase One Property, as well as all properties situated wholly, or partly, within 250 m from the nearest point of a boundary of the Phase One Property, in order to meet the minimum requirements set forth in O. Reg. 153/04.

4.1.2 First Developed Use Determination

The first developed land use of the Phase One Property is defined by O. Reg. 153/04 to be the earlier of:

- The first use of a Phase One Property in or after 1875 that resulted in the development of a building or structure on the property; and
- The first potentially contaminating use or activity on the Phase One Property.

© 2023 Pinchin Ltd.

A review of the aerial photographs indicated that the Phase One Property has not been developed with any buildings and/or permanent structures. The 1952 aerial photograph indicated that the forested area throughout the Phase One Property had been removed for the land to be used for agricultural purposes.

It is Pinchin's opinion that the date of the first use of the Phase One Property is prior to 1952, with the removal of the forested area on the Phase One Property. The date of the first developed use of the Phase One Property was determined through a review of aerial photographs. No other historical records were available to Pinchin that provided information for determining the date of first developed use of the Phase One Property.

4.1.3 Fire Insurance Plans

Pinchin previously contacted Opta Information Intelligence (Opta) to obtain Fire Insurance Plans (FIPs) related to the Phase One Property and the Phase One Study Area. A response was received from Opta dated March 15, 2022, which indicated that no FIPs for the Phase One Property and Phase One Study Area were available. The Opta response is provided in Appendix C.

4.1.4 Environmental Reports

The following previous environmental reports for the Phase One Property were reviewed by Pinchin:

- Report entitled *"Phase I Environmental Site Assessment, 2275 Mer Bleue Road, Ottawa, Ontario",* prepared by Paterson Group Inc. (Paterson) for Caivan Development Corporation, and dated September 30, 2020 (2020 Paterson Phase I ESA Report); and
- Report entitled *"Phase I Environmental Site Assessment, 2275 Mer Bleue Road, Ottawa, Ontario"* prepared by Pinchin for Broadstreet Properties Ltd., and dated April 1, 2022 (2022 Pinchin Phase I ESA Report).

Pinchin reviewed the available soil and groundwater sample analytical data provided in the above-referenced reports to assess whether there are any known soil and groundwater impacts at the Phase One Property.

A summary of the salient information identified in the reports is provided below.

<u>2020 Paterson Phase I ESA Report</u>

The Phase I ESA completed by Paterson in September 2020 consisted of historical reviews, a review of surrounding properties, a regulatory database search, and interviews as well as an exterior assessment of the Phase One Property.

The results of the 2020 Paterson Phase I ESA Report indicated that there were no significant potential environmental concerns associated with the current and historical use of the Phase One Property and adjacent properties and as such, no further environmental assessment work was recommended.

© 2023 Pinchin Ltd.

2022 Pinchin Phase I ESA Report

The Phase I ESA completed by Pinchin in April 2022 consisted of historical reviews, a review of surrounding properties, a regulatory database search, and interviews as well as an exterior assessment of the Phase One Property. In addition, Pinchin reviewed the above-noted report.

The results of the 2022 Pinchin Phase I ESA Report indicated that there were no significant potential environmental concerns associated with the current and historical use of the Phase One Property and adjacent properties and as such, no further environmental assessment work was recommended.

4.1.4.1 Previous Environmental Report Summary

Based on Pinchin's review of the above-referenced previous environmental reports, no PCAs were identified within the Phase One Study Area.

4.2 Environmental Source Information

Pinchin reviewed the historical use of the Phase One Study Area through the use of publicly available archives and databases, as well as through requesting information from regulatory agencies. The following provides a summary of the information obtained from these sources.

4.2.1 Environmental Database Search – ERIS

Pinchin retained ERIS to search all available federal, provincial and private source databases for information pertaining to the Phase One Study Area. Unless otherwise noted, information obtained from the ERIS database search was reviewed for the entire Phase One Study Area. A copy of the ERIS report is provided in Appendix D and the results of the database search are described in the following sections.

4.2.1.1 National Pollutant Release Inventory

ERIS completed a search of the federal databases for information regarding the National Pollutant Release Inventory (NPRI). This database contains comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances and identifies information such as the approximate location, type and quantity of contaminant, date of release, and media impacted.

Pinchin reviewed the ERIS report for NPRI information and found no records regarding the Phase One Study Area.

4.2.1.2 Ontario Inventory of PCB Storage Sites

The MECP's Waste Management Branch maintains an inventory of polychlorinated biphenyl (PCB) storage sites within Ontario. Ontario Regulation 11/82 and Ontario Regulation 347 (O. Reg. 347), made under the EPA, require the registration of inactive PCB storage equipment and/or disposal sites of PCB

© 2023 Pinchin Ltd.

waste with the MECP. This database contains information on waste quantities, major and minor sites storing liquid or solid waste, and a waste storage inventory.

ERIS completed a search of the Ontario Inventory of PCB Storage Sites for information regarding PCB storage and found no information regarding the Phase One Study Area.

4.2.1.3 National PCB Inventory

Environment Canada maintains an inventory of in-use PCB-containing equipment at federal, provincial and private facilities in Canada, and of out-of-service PCB-containing equipment and PCB waste owned by the federal government or federally regulated industries.

ERIS completed a search of the National PCB Inventory and found no information regarding the Phase One Study Area.

4.2.1.4 Certificates of Approval

ERIS completed a search of the MECP database for information regarding Certificates of Approval (Cs-of-A). The MECP maintains a database of approved Cs-of-A for Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. Prior to November 1, 2011, the MECP mandated that any facility that released emissions to the atmosphere, discharged contaminants to ground or surface water, provided potable water supplies, or stored, transported or disposed of waste, must have a C-of-A before it could operate lawfully. The MECP no longer issues Cs-of-A, which were replaced by Environmental Compliance Approvals (ECAs) as of November 1, 2011. O. Reg. 153/04 indicates that information from the C-of-A database only needs to be obtained for the Phase One Property and properties adjacent to the Phase One Property.

The ERIS search of the C-of-A database identified no information regarding Cs-of-A for the Phase One Property or for properties adjacent to the Phase One Property.

4.2.1.5 Environmental Compliance Approvals, Permits To Take Water and Certificates of Property Use

ERIS completed a search of the MECP database for information regarding ECAs, permits including Permits To Take Water (PTTWs) and Certificates of Property Use (CPUs). O. Reg. 153/04 indicates that information from these databases only needs to be obtained for the Phase One Property and properties adjacent to the Phase One Property. Details regarding these databases are provided in the ERIS report in Appendix D.

The ERIS search of the ECA database identified one ECA for the Phase One Property and one ECA for properties adjacent to the Phase One Property. All of these ECAs were for air emissions, sewage works and municipal water works and no ECAs were identified for discharge to groundwater, which is considered the primary pathway of concern for contaminant impacts on the Phase One Property. As

© 2023 Pinchin Ltd.

such, Pinchin does not consider the activities related to ECAs at the Phase One Property and properties adjacent to the Phase One Property to represent PCAs.

The ERIS search of the PTTW and CPU databases identified no information regarding PTTWs or CPUs for the Phase One Property and properties adjacent to the Phase One Property.

4.2.1.6 Inventory of Coal Gasification Plants

ERIS searched the following publications prepared for the MECP by Intera Technologies Inc. for information on industrial sites that formerly operated as coal gasification plants, and industrial sites that produced or used coal tar and other related tars:

- "*Inventory of Coal Gasification Plant Waste Sites in Ontario*", dated April 1987; and
- "*Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario*", dated November 1988.

The ERIS search yielded no records of former coal gasification plants or the production or use of coal tar and related tars within the Phase One Study Area.

4.2.1.7 Environmental Incidents, Orders, Offences and Spills

ERIS completed a search of the various provincial and federal databases for information regarding environmental incidents, orders, offences and spills. O. Reg. 153/04 indicates that information from these databases only needs to be obtained for the Phase One Property and properties adjacent to the Phase One Property. Details regarding the searched databases are provided in the ERIS report in Appendix D.

The ERIS database search revealed no records of environmental incidents, orders, offences or spills for the Phase One Property and properties adjacent to the Phase One Property.

4.2.1.8 Waste Management Records

Waste Generators

ERIS completed a search of the O. Reg. 347 Waste Generators database for information regarding waste generation. O. Reg. 347 defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution, etc. The database search results provide a summary of available waste generation information for the registered sites for all years from 1986 to the present.

© 2023 Pinchin Ltd.

O. Reg. 153/04 indicates that information from the Waste Generator database only needs to be obtained for the Phase One Property and properties adjacent to the Phase One Property. However, in addition to the Phase One Property and adjacent off-Site properties, Pinchin reviewed the database for waste generators within 50 m transgradient and 100 m upgradient of the Phase One Property with respect to the inferred groundwater flow direction. The area reviewed will be referred to as the Waste Generator Database Review Area.

The ERIS search of the O. Reg. 347 Waste Generators database found no information regarding the Waste Generator Database Review Area.

Waste Receivers

ERIS completed a search of the O. Reg. 347 Waste Receivers database for information regarding waste receivers. O. Reg. 347 defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database contains registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants.

O. Reg. 153/04 indicates that information from the Waste Receivers database only needs to be obtained for the Phase One Property and properties adjacent to the Phase One Property. However, in addition to the Phase One Property and adjacent off-Site properties, Pinchin reviewed the database for waste receivers within 50 m transgradient and 100 m upgradient of the Phase One Property with respect to the inferred groundwater flow direction. The area reviewed will be referred to as the Waste Receivers Database Review Area.

The ERIS search of the O. Reg. 347 Waste Receivers database found no information regarding the Waste Receivers Database Review Area.

4.2.1.9 Fuel Storage Tanks

ERIS completed a search of various private, provincial and federal databases for information regarding chemical storage tanks, as well as private and retail fuel storage tanks. Details regarding the searched databases are provided in the ERIS report in Appendix D.

The ERIS search of the chemical and fuel storage tank databases found no information regarding the Phase One Study Area.

4.2.1.10 Notices and Instruments

ERIS completed a search of the provincial Environmental Registry for records pertaining to proposals, decisions, and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. ERIS also searched the Record of Site Condition (RSC) databases for filed RSCs.

© 2023 Pinchin Ltd.

No records were found in the Environmental Registry and RSC databases regarding the Phase One Study Area.

4.2.1.11 Areas of Natural Significance

ERIS reviewed available databases and records to assess whether any parks, wetlands, conservation areas, or other areas of natural significance, are located within the Phase One Study Area. The Area of Natural & Scientific Interest map is included in the ERIS report in Appendix D. In addition, Pinchin reviewed information provided on the Ministry of Natural Resources and Forestry's (MNRF) Natural Heritage Information Centre (NHIC) website. No areas of natural significance were identified within the Phase One Study Area from these information sources.

4.2.1.12 Landfill Information

ERIS reviewed available private and provincial databases for records of any current or inactive landfills and waste disposal sites within the Phase One Study Area. Details regarding the searched databases are provided in the ERIS report in Appendix D.

The ERIS search of the landfill and waste disposal sites databases found no information regarding the Phase One Study Area.

4.2.2 Ministry of the Environment, Conservation and Parks Freedom of Information Search

The MECP Freedom of Information and Protection of Privacy Office in Toronto, Ontario was previously contacted to determine if records exist for environmental matters such as orders, spills, previous investigations, prosecutions, registered PCB waste storage sites, waste generators, waste receivers, Cs-of-A and ECAs associated with the Phase One Property.

A letter response from the MECP on September 10, 2021, provided a *Design Brief for Cassette Subdivision (2275 Mer-Bleue Road)* by Caivan (Mer-Bleue) Inc. The MECP response provides an overview on the development plan for the Phase One Property. A copy of the MECP response is provided in Appendix E of this report.

4.2.3 Property Underwriters' Reports and Plans

PURs provide detailed information on a site-specific basis, including descriptions of building construction, heating sources, production processes, and the presence of any hazardous chemicals or materials which may have been historically stored on the Phase One Property. They also indicate the presence of environmental hazards such as electrical rooms, transformers, boilers and storage tanks. Information provided on PUPs the location, capacity, and contents of aboveground storage tanks (ASTs), underground storage tanks (USTs), chemical storage and other forms of environmental hazards.

© 2023 Pinchin Ltd.

Pinchin previously contacted Opta to obtain copies of PURs and PUPs related to the Phase One Property. A response was received from Opta dated March 15, 2022, which indicated that no PURs or PUPs for the Phase One Property were available. The Opta response is provided in Appendix E.

4.2.4 City Directories

City directories for the years 1984 to 2011 were reviewed by Pinchin at the Library and Archives of Canada in Ottawa, Ontario for the area within 100 m of the Phase One Property (City Directory Search Area). In addition, the Phase One Property was not listed in any of the city directories reviewed by Pinchin.

In general, the city directories indicated that the surrounding area has historically consisted of residential, commercial, light industrial and institutional land uses since 1984. No historical dry-cleaning operations, RFOs or other operations of potential environmental concern were identified, with the exception of the following:

- Automotive repair/servicing facilities (i.e., JP Collision Inc. and P&M Auto Shop) were located at 2319 Mer Bleue Road from 1995 to 2001, and an automotive repair/servicing facility is still active on this property. This property is located approximately 70 m southeast of the Phase One Property. In addition, this property is situated hydraulically downgradient of the Phase One Property relative to the inferred groundwater flow direction. Based on the distance between this property and the Phase One Property, as well as the inferred groundwater flow direction, it is Pinchin's opinion that this PCA does not result in an APEC at the Phase One Property.

4.3 Physical Setting Sources

4.3.1 Aerial Photographs

Pinchin reviewed aerial photographs of the Phase One Property and surrounding properties within the Phase One Study Area to assess the potential for historical PCAs. Copies of aerial photographs dated 1952, 1967, 1977, 1984 and 1997 were obtained from the National Air Photo Library in Ottawa, Ontario and reviewed by Pinchin. In addition, Pinchin reviewed Google Earth™ satellite imagery dated 2003, 2013 and 2022. The 1952 aerial photograph was the earliest available aerial photograph of the Phase One Study Area.

Efforts were made by Pinchin to obtain aerial photographs that:

- Illustrated the period between initial development of the Phase One Property to the present;
- Identified buildings and structures present on the Phase One Property since initial development;

© 2023 Pinchin Ltd.

- Identified PCAs within the Phase One Study Area; and
- Identified APECs on the Phase One Property.

It should be noted that accurate details could not be determined from some of the aerial photographs due to the large reference scale and the low resolution of the photographs.

A summary of information obtained with respect to the Phase One Property from a review of the available aerial photography is provided in the following table:

Year of Photograph	Phase One Property
1952-2022.	The Phase One Property appeared to consist of vacant undeveloped land.

Based on the aerial photographs reviewed for the Phase One Property and the surrounding area, it appears that the Phase One Property has not been developed.

The aerial photograph review did not identify any PCAs on the Phase One Property or within the Phase One Study Area, outside of the Phase One Property.

4.3.2 Topography, Hydrology and Geology

The elevation of the Phase One Property, based on information obtained from the Ontario Base Map series, is approximately 88 m above mean sea level (mamsl). The general topography in the local and surrounding area is generally flat. No bedrock outcrops were observed on-Site or in the surrounding area.

A review of the available physiographical data indicates that the Phase One Property and the surrounding properties located within the Phase One Study Area are located within alluvial deposits consisting of stratified gravel, sand, silt and clay. Bedrock is expected to consist of sedimentary rocks consisting of limestone, dolomite, shale, argillite, sandstone, quartzite, and/or grit. The topography is considered to be mainly flat to rolling low local relief with dry surface water drainage conditions.

Based on general hydrogeological principles and Pinchin's familiarity with subsurface conditions at and near the Phase One Property and the surrounding properties within the Phase One Study Area, the unconfined groundwater beneath the Phase One Property is expected to flow in a southeast direction. The nearest surface water body is McKinnons Creek, located approximately 245 m southeast of the Phase One Property at an elevation of approximately 88 mamsl.

Copies of pertinent maps, illustrating local topographical, hydrogeological and drainage features are provided in Appendix F.

© 2023 Pinchin Ltd.

4.3.3 Fill Materials

The historical records review provided no information regarding the presence of fill material at the Phase One Property.

Although the Phase One ESA did not identify any historical or current fill material at the Phase One Property, potential future development plans should incorporate the appropriate procedures for the characterization of soils that may require off-Site disposal. Further assessment and/or costs may be incurred through re-development of the Phase One Property and/or change in land use scenarios.

4.3.4 Water Bodies, Areas of Natural Significance and Groundwater Information

The nearest surface water body is McKinnons Creek, located approximately 245 m southeast of the Phase One Property at an elevation of approximately 88 mamsl.

A review of the Area of Natural & Scientific Interest map prepared by ERIS (see Appendix D) and information provided on the MNRF's NHIC website did not identify any provincial parks, wetlands, conservation areas, or other areas of natural significance, within the Phase One Study Area.

A review of the City of Ottawa's GeoOttawa website indicated that the Phase One Study Area is not located within a well head protection area for the protection of groundwater.

The records review did not identify the presence of wells within the Phase One Study Area that supply water for human consumption or for agricultural purposes.

4.3.5 Well Records

The Water Well Information System database search did not identify any water well records for the Phase One Property but did identify five water well records within the Phase One Study Area outside of the Phase One Property. Details regarding these off-Site wells, including stratigraphic information, depth to bedrock and/or depth to the water table, are provided in the ERIS report included in Appendix D.

4.4 Site Operating Records

The Phase One Property is not an Enhanced Investigation Property (see Section 6.3). As such, Site operating records were not reviewed as part of the Phase One ESA.

© 2023 Pinchin Ltd.

5.0 INTERVIEWS

Pinchin interviewed an individual knowledgeable of the Phase One Property and its history to obtain or confirm information regarding the environmental condition of the Phase One Property. The following individual provided information regarding the history of the Phase One Property and the surrounding properties within the Phase One Study Area to the best of their knowledge:

Person Interviewed	Relationship to Phase One Property	Date and Place of Interview	Interview Method
Josh Samson	Corporate Treasurer with Broadstreet Properties Ltd.	April 20, 2023 (email correspondence)	Email correspondence following Site reconnaissance.

Josh Samson was chosen to be interviewed given that they are most familiar with the recent operational history of the Phase One Property. This individual is hereafter referred to as the “Site Representative”, and assisted the Pinchin representative (Mr. Alex Kelly) following the Site reconnaissance via email correspondence.

Pinchin compared the information obtained from the interview with information obtained from the historical records. The information provided by the interviewee was corroborated by the available historical records. As such, Pinchin has no concerns regarding the validity of the information provided by the individual interviewed for the Phase One ESA.

With respect to PCAs and APECs, no additional information was obtained from the interviews other than that documented elsewhere in this report.

6.0 SITE RECONNAISSANCE

6.1 General Requirements

A visual assessment of the Phase One Property and the surrounding properties within the Phase One Study Area was conducted for the purpose of identifying the presence of possible PCAs and associated APECs.

The Site reconnaissance was completed on April 20, 2023, by a Pinchin representative (Mr. Alex Kelly), under the direct supervision of Pinchin’s QP overseeing this project. Mr. Kelly is an Environmental Project Technologist with more than three years of environmental consulting experience. Pinchin visited the Phase One Property and surrounding properties within the Phase One Study Area to document environmental conditions. During the Site reconnaissance, Pinchin viewed all accessible areas within the Phase One Property, and viewed publicly-accessible portions of the adjacent lands for the presence of actual or potential issues of environmental concern.

© 2023 Pinchin Ltd.

The Site reconnaissance was conducted between the hours of 9:30 AM and 10:30 AM. During the Site reconnaissance, the ground surface was dry and the weather was sunny, and the ambient temperature was approximately 10° Celsius. The Phase One Property reconnaissance was conducted on foot. During the Site reconnaissance, Pinchin accessed all exterior areas of the Phase One Property. Further details regarding on-Site operations are provided throughout Section 6.2 of this report.

Photographs taken during the Site reconnaissance that illustrate the Phase One Property and Phase One Study Area are provided in Appendix B.

6.2 Specific Observations at Phase One Property

6.2.1 Description of Buildings and Structures

There were no buildings or structures present on the Phase One Property at the time of the Site reconnaissance.

6.2.2 Description of Below-Ground Structures

There were no below-ground structures present on the Phase One Property at the time of the Site reconnaissance.

6.2.3 Description of Tanks

During the Site reconnaissance, Pinchin did not observe any tanks on the Phase One Property for the purpose of either fuel dispensing or storage, or other unidentified substance storage.

6.2.4 Potable and Non-Potable Water Sources

The Phase One Property is currently not serviced by a municipal water supply.

6.2.5 Description and Location of Underground Utilities

The Phase One Property has remained undeveloped and there are no known underground utilities.

6.2.6 Details of Heating System

No heating systems are present on-Site.

6.2.7 Details of Cooling System

No cooling systems are present on-Site.

6.2.8 Details of Drains, Pits and Sumps

No drains, pits or sumps were observed at the Phase One Property.

© 2023 Pinchin Ltd.

6.2.9 Unidentified Substances within Buildings and Structures

During the Site reconnaissance, Pinchin did not observe any unidentified substances or storage containers holding unidentified substances at the Phase One Property.

6.2.10 Details of Staining and Corrosion

During the Site reconnaissance, Pinchin did not observe any areas of staining or corrosion.

6.2.11 Details of On-Site Wells

No water supply or groundwater monitoring wells were observed to be on or within the Phase One Property. No water supply or groundwater monitoring wells were reported by the Site owner to have been on-Site, prior to, or during their occupancy.

6.2.12 Details of Sewage Works

During the Site reconnaissance, Pinchin did not observe any sewage works or evidence of sewage disposal on the Phase One Property.

6.2.13 Details of Ground Cover

During the Site reconnaissance, Pinchin visually inspected the Phase One Property ground cover. The Phase One Property consisted of dirt-covered and grassed/vegetated areas.

6.2.14 Details of Current or Former Railways

No current or former railway infrastructure was observed on the Phase One Property.

6.2.15 Areas of Stained Soil, Vegetation and Pavement

During the Site reconnaissance, Pinchin did not observe any areas of stained soil, vegetation or pavement on the Phase One Property.

6.2.16 Areas of Stressed Vegetation

During the Site reconnaissance, Pinchin did not observe any areas of stressed vegetation on the Phase One Property.

6.2.17 Areas of Fill and Debris Materials

No obvious areas where fill material or debris have been placed or graded were observed by Pinchin at the Phase One Property.

6.2.18 Potentially Contaminating Activities

A PCA is defined by O. Reg. 153/04 as a “use or activity set out in Column A of Table 2 of Schedule D that is occurring or has occurred in a Phase One Study Area” including the Phase One Property.

© 2023 Pinchin Ltd.

6.2.19 Unidentified Substances Outside Buildings and Structures

During the Site reconnaissance, Pinchin did not observe any unidentified substances or storage containers holding unidentified substances on the exterior of the Phase One Property.

6.2.20 Surrounding Land Uses

During the Site reconnaissance, Pinchin conducted a visual assessment of publicly-accessible portions of the Phase One Study Area for the presence of PCAs. The properties in the Phase One Study Area have various land uses, including residential, commercial, light industrial, parkland, institutional and vacant. Land use types within the Phase One Study Area are presented on Figure 2.

The following table summarizes the land use on adjacent properties at the time of the Site reconnaissance:

Direction Relative to Phase One Property	Location Relative to Inferred Groundwater Flow Direction	Description of Property Use	Property Use	Potential Contribution to PCA and/or APEC
North	Up/transgradient	An institutional development and associated roadways to beyond 200 m from the Phase One Property.	Institutional	Land uses are not considered to represent PCAs.
South	Down/transgradient	Residential dwellings, a light industrial development, parkland and associated roadways to beyond 200 m from the Phase One Property.	Residential/ Light industrial/ Parkland	Land uses are considered to represent PCAs.
East	Down/transgradient	Residential dwellings and associated roadways to beyond 200 m from the Phase One Property.	Residential	Land uses are not considered to represent PCAs.
West	Up/transgradient	A commercial development, vacant undeveloped land and associated roadways to beyond 200 m from the Phase One Property.	Commercial/ Vacant	Land uses are not considered to represent PCAs.

Pinchin observed the following PCAs at the time of the Site reconnaissance within the rest of the Phase One Study Area:

- An automotive repair/servicing facility was observed on the property located approximately 70 m southeast of the Phase One Property. In addition, this property is situated hydraulically downgradient of the Phase One Property relative to the inferred groundwater flow direction. Based on the distance between this property and the Phase

© 2023 Pinchin Ltd.

One Property, as well as the inferred groundwater flow direction, it is Pinchin's opinion that this PCA does not result in an APEC at the Phase One Property; and

- A total of one pole-mounted and five pad-mounted oil-cooled transformers were observed within 250 m of the Phase One Property; however, no evidence of spills or historical spills (i.e., staining) was observed in the vicinity of these transformers and no issues of potential environmental concern (i.e., spills) were noted for these transformers within the ERIS report. In addition, any maintenance/environmental issues associated with these transformers would be the responsibility of Hydro One. Based on the above-noted information, as well as the distance between these transformers and the Phase One property, it is Pinchin's opinion that these PCAs do not represent APECs at the Phase One Property.

6.3 Enhanced Investigation Property

O. Reg. 153/04 defines an "Enhanced Investigation Property" as a property that is being used or has been used, in whole or in part, in the following manner:

- For an industrial use or;
- For any of the following commercial uses:
  - As a garage;
  - As a bulk liquid dispensing facility, including a gasoline outlet; or
  - For the operation of dry-cleaning equipment.

The findings of this Phase One ESA have not documented any of the above land uses as occurring at the Phase One Property, and the Phase One Property is therefore not an Enhanced Investigation Property.

6.4 Written Description of Investigation

The Phase One ESA completed by Pinchin included investigations of the Phase One Property and the Phase One Study Area outside of the Phase One Property pursuant to Sections 13 and 14 of Schedule D of O. Reg.153/04. The main objective of these investigations was to identify PCAs at the Phase One Property or within the Phase One Study Area outside of the Phase One Property that could have resulted in APECs at the Phase One Property.

6.4.1 Phase One Property

The investigation of the Phase One Property consisted of the following components:

- Review of available historical records, including previous environmental reports, ERIS regulatory search, select city directories, aerial photographs and well records;

© 2023 Pinchin Ltd.

- A Site reconnaissance completed on April 20, 2023, by Mr. Alex Kelly of Pinchin that included an assessment of the exterior of the Phase One Property;
- Interviews with an individual knowledgeable of the history and operations at the Phase One Property; and
- Review of mapping provided by ERIS and information provided on-line by the MNRF for the presence of areas of natural significance.

Pinchin's investigation of the Phase One Property did not identify any PCAs on the Phase One Property.

Pinchin's investigation did not identify the presence of wells at the Phase One Property that currently supply water for human consumption or for agricultural purposes.

6.4.2 Phase One Study Area Outside of Phase One Property

The investigation of the Phase One Study Area outside of the Phase One Property consisted of the following components:

- Review of available historical records, including ERIS regulatory search, select city directories, aerial photographs and well records;
- Visual inspection of properties from publicly-accessible areas for evidence of PCAs and water bodies; and
- Review of mapping provided by ERIS and information provided on-line by the MNRF for the presence of areas of natural significance.

Pinchin's investigation of the Phase One Study Area outside of the Phase One Property identified the following PCAs:

- PCA #1 (Item 10: Commercial autobody shops - an automotive repair/servicing facility has been located approximately 70 m southeast of the Phase One Property since 1995). In addition, this property is situated hydraulically downgradient of the Phase One Property relative to the inferred groundwater flow direction. Based on the distance between this property and the Phase One Property, as well as the inferred groundwater flow direction, it is Pinchin's opinion that this PCA does not result in an APEC at the Phase One Property; and
- PCAs #2-7 (Item 55: Transformer Manufacturing, Processing and Use – a total of one pole-mounted and five pad-mounted oil-cooled transformers are located within 250 m of the Phase One Property). However, no evidence of spills or historical spills (i.e., staining) was observed in the vicinity of these transformers and no issues of potential environmental concern (i.e., spills) were noted for these transformers within the ERIS report. In addition, any maintenance/environmental issues associated with these

© 2023 Pinchin Ltd.

transformers would be the responsibility of Hydro One. Based on the above-noted information, as well as the distance between these transformers and the Phase One property, it is Pinchin's opinion that these PCAs do not result in APECs at the Phase One Property.

No areas of natural significance were identified within the Phase One Study Area outside of the Phase One Property.

The records review did not identify the presence of wells within the Phase One Study Area that supply water for human consumption or for agricultural purposes.

Based on a cursory review of the properties greater than 250 m (i.e., outside of the Phase One Study Area), but less than 1 km, from the Phase One Study Area, Pinchin did not note or observe any significant contaminating properties that should be included as part of this assessment (i.e., landfills, large industrial manufacturers, etc.).

A plan identifying the location of the off-Site PCAs for this Phase One ESA is provided on Figure 3.

7.0 REVIEW AND EVALUATION OF INFORMATION

7.1 Current and Past Uses

A review of the aerial photographs indicated that the Phase One Property has not been developed with any buildings and/or permanent structures. The 1952 aerial photograph indicated that the forested area throughout the Phase One Property had been removed for the land to be used for agricultural purposes.

It is Pinchin's opinion that the date of the first use of the Phase One Property is prior to 1952, with the removal of the forested area on the Phase One Property. The date of the first developed use of the Phase One Property was determined through a review of aerial photographs. No other historical records were available to Pinchin that provided information for determining the date of first developed use of the Phase One Property.

7.2 Potentially Contaminating Activities

Pinchin's investigation of the Phase One Property did not identify any PCAs on the Phase One Property.

The following PCAs as defined by O. Reg. 153/04 was documents by Pinchin to have occurred within the Phase One Study Area, outside of the Phase One Property:

- PCA #1 (Item 10: Commercial autobody shops - an automotive repair/servicing facility has been located approximately 70 m southeast of the Phase One Property since 1995). In addition, this property is situated hydraulically downgradient of the Phase One Property relative to the inferred groundwater flow direction. Based on the distance

© 2023 Pinchin Ltd.

between this property and the Phase One Property, as well as the inferred groundwater flow direction, it is Pinchin's opinion that this PCA does not result in an APEC at the Phase One Property; and

- PCAs #2-7 (Item 55: Transformer Manufacturing, Processing and Use – a total of one pole-mounted and five pad-mounted oil-cooled transformers are located within 250 m of the Phase One Property). However, no evidence of spills or historical spills (i.e., staining) was observed in the vicinity of these transformers and no issues of potential environmental concern (i.e., spills) were noted for these transformers within the ERIS report. In addition, any maintenance/environmental issues associated with these transformers would be the responsibility of Hydro One. Based on the above-noted information, as well as the distance between these transformers and the Phase One property, it is Pinchin's opinion that these PCAs do not result in APECs at the Phase One Property.

7.3 Areas of Potential Environmental Concern

No APECs as defined by O. Reg. 153/04 were identified by Pinchin at the Phase One Property.

7.4 Phase One Conceptual Site Model

A conceptual site model (CSM) has been created to provide a summary of the findings of the Phase One ESA. The Phase One CSM is summarized in Figures 1 through Figure 3, which illustrate the following features within the Phase One Study Area, where present:

- Existing buildings and structures;
- Water bodies located in whole or in part within the Phase One Study Area;
- Areas of natural significance located in whole or in part within the Phase One Study Area;
- Drinking water wells located at the Phase One Property;
- Land use of adjacent properties;
- Roads within the Phase One Study Area;
- PCAs within the Phase One Study Area, including the locations of tanks; and
- APECs at the Phase One Property.

The following provides a narrative summary of the Phase One CSM:

- The Phase One Property is approximately 8.8 acres (3.6 hectares) in size and located immediately east of Mer Bleue Road, approximately 265 m southwest of the intersection

© 2023 Pinchin Ltd.

of Brian Coburn Boulevard East, Jerome Jodoin Drive and Gerry Lalonde Drive, in Ottawa, Ontario;

- The nearest surface water body is McKinnons Creek, located approximately 245 m southeast of the Phase One Property at an elevation of approximately 88 mamsl;
- No areas of natural significance were identified within the Phase One Study Area;
- No drinking water wells were located on the Phase One Property;
- The adjacent and surrounding properties in the vicinity of the Site consist of vacant, residential, commercial, light industrial, parkland, institutional and vacant land uses. The properties located north of the Phase One Property consist of an institutional development and associated roadways to beyond 200 m from the Phase One Property; the properties located south of the Phase One Property consist of residential dwellings, a light industrial operation, parkland and associated roadways to beyond 200 m from the Phase One Property; the properties located east of the Phase One Property consist of residential dwellings and associated roadways to beyond 200 m from the Phase One Property; and the properties located west of the Phase One Property consist of a commercial development, vacant undeveloped land and associated roadways to beyond 200 m from the Phase One Property;
- No PCAs were identified within the Phase One Property. Seven PCAs were identified within the Phase One Study Area:
    - An automotive repair/servicing facility has been located approximately 70 m southeast of the Phase One Property since 1995; and
    - A total of one pole-mounted and five pad-mounted oil-cooled transformers are located within 250 m of the Phase One Property.

  However, no evidence of spills or historical spills (i.e., staining) observed in the vicinity of the transformers and no issues of potential environmental concern (i.e., spills) were noted for the transformers within the ERIS report and any maintenance/environmental issues associated with the transformers would be the responsibility of Hydro One. Based on the above-noted information; the distance between these properties and the Phase One property and the inferred groundwater flow direction, it is Pinchin's opinion that these PCAs do not represent APECs for the Phase One Property. Based on these findings, nothing was identified that is likely to have resulted in impacts to the soil and/or groundwater at the Phase One Property and would require the completion of a Phase Two ESA. As such, it is Pinchin's opinion that the Phase One Property is suitable for the purpose of filing a Site Plan Approval with the City of Ottawa based only on the completion of this Phase One ESA report;

© 2023 Pinchin Ltd.

- The Phase One Property and the surrounding properties located within the Phase One Study Area are located within alluvial deposits consisting of stratified gravel, sand, silt and clay. Bedrock is expected to consist of sedimentary rocks consisting of limestone, dolomite, shale, argillite, sandstone, quartzite, and/or grit; and
- The Phase One Property is relatively flat. Local groundwater flow is inferred to be to the southeast, based on the nearest body of water.

There were no deviations from the Phase One ESA requirements specified in O. Reg. 153/04 or absence of information that have resulted in uncertainty that would affect the validity of the Phase One CSM.

8.0 CONCLUSIONS

Pinchin conducted this Phase One ESA in accordance with Part VII and Schedule D of O. Reg. 153/04. The purpose of the Phase One ESA was to assess the potential presence of environmental impacts at the Phase One Property due to activities at and near the Phase One Property in support of filing the potential Site Plan Approval application at the Phase One Property.

Based on the findings of this Phase One ESA, Pinchin did not identify any PCAs at the Phase One Property. Seven PCAs were identified within the Phase One Study Area:

- An automotive repair/servicing facility has been located approximately 70 m southeast of the Phase One Property since 1995; and
- A total of one pole-mounted and five pad-mounted oil-cooled transformers are located within 250 m of the Phase One Property.

However, no evidence of spills or historical spills (i.e., staining) observed in the vicinity of the transformers and no issues of potential environmental concern (i.e., spills) were noted for the transformers within the ERIS report and any maintenance/environmental issues associated with the transformers would be the responsibility of Hydro One. Based on the above-noted information; the distance between these properties and the Phase One property and the inferred groundwater flow direction, it is Pinchin's opinion that these PCAs do not represent APECs for the Phase One Property. Based on these findings, nothing was identified that is likely to have resulted in impacts to the soil and/or groundwater at the Phase One Property and would require the completion of a Phase Two ESA. As such, it is Pinchin's opinion that the Phase One Property is suitable for the purpose of filing a Site Plan Approval with the City of Ottawa based only on the completion of this Phase One ESA report.

It should be noted that the references and sources for the information used in evaluating the Phase One Property are provided in the relevant sections of this report. Specific references are also summarized in Section 9.0.

© 2023 Pinchin Ltd.

8.1 Signatures

This Phase One ESA was undertaken under the supervision of Scott Mather, P.Eng, QP_{ESA} in accordance with the requirements of O. Reg. 153/04 to support the future Site Plan Approval application at the Phase One Property. The conclusions and recommendations provided in this report represent the best judgement of the assessor based on the Site conditions observed on April 20, 2023, and a review of available historical information and information obtained from interviews.

This report has been issued without having received a response to the request for information from the MECP. Pinchin reserves the right to amend our conclusions and recommendations based on information obtained from this regulatory agency.

We trust that the information provided in this report meets your current requirements.

8.2 Terms and Limitations

This Phase One ESA was performed in order to identify potential issues of environmental concern associated with the property located at 2275 Mer Bleue Road, in Ottawa, Ontario (Site), at the time of the Site reconnaissance. This Phase One ESA was performed in general compliance with currently acceptable practices for environmental site investigations, and specific Client requests, as applicable to this Site. This report was prepared for the exclusive use of Broadstreet Properties Ltd. (Client), subject to the terms, conditions and limitations contained within the duly authorized proposal for this project. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

If additional parties require reliance on this report, written authorization from Pinchin will be required. Such reliance will only be provided by Pinchin following written authorization from the Client. Pinchin disclaims responsibility of consequential financial effects on transactions or property values, or requirements for follow-up actions and costs. No other warranties are implied or expressed. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law.

The information provided in this report is based upon analysis of available documents, records and drawings, and personal interviews. In evaluating the Site, Pinchin has relied in good faith on information provided by other individuals noted in this report. Pinchin has assumed that the information provided is factual and accurate. In addition, the findings in this report are based, to a large degree, upon information provided by the current owner/occupant. Pinchin accepts no responsibility for any deficiency, misstatement or inaccuracy contained in this report as a result of omissions, misinterpretations or fraudulent acts of persons interviewed or contacted, or contained in reports that were reviewed. The scope of work for this Phase One ESA did not include a visual or intrusive investigation for designated

© 2023 Pinchin Ltd.

substances (e.g., asbestos, mould, PCB-containing electrical equipment, etc.) and, therefore, these materials may be present at the Site.

Pinchin makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time.

Ontario Regulation 153/04 does not apply to environmental auditing or environmental management systems. Therefore, with respect to Site operations and conditions, compliance with applicable federal, provincial or municipal acts, regulations, laws and/or statutes was not evaluated as part of the Phase One ESA.

9.0 REFERENCES

The following documents, persons or organizations provided information used in this report:

- Josh Samson, Corporate Treasurer with Broadstreet Properties Ltd. [Site Representative].
- ERIS reported entitled “2275 Mer Bleue Road, Ottawa, Ontario”, and dated April 27, 2023 (ERIS Project # 23042400186).
- Opta Information Intelligence.
- The Atlas of Canada – Surficial Materials: http://atlas.nrcan.gc.ca/site/english/maps/environment/land/surficialmaterials/1
- The Atlas of Canada – Bedrock Geology: http://atlas.gc.ca/site/english/maps/archives/3rdedition/environment/land/016?w=4&h=4&l=6&r=4&c=12.
- Toporama – Topographic Maps: http://atlas.gc.ca/site/english/maps/topo/map.
- Province of Ontario. Environmental Protection Act R.S.O. 1990, c. E.19 and Ontario Regulation 153/04: Records of Site Condition – Part XV.1 of the Act. Last amended by Ontario Regulation 333/13 on December 13, 2013.
- Canadian Standards Association (CSA) Standard. CSA Z768-01, Phase I Environmental Site Assessment, Canadian Standards Association International, November 2001, reaffirmed in 2012.
- Ministry of the Environment, Conservation and Parks.

© 2023 Pinchin Ltd.

- MECP Brownfields Environmental Site Registry.
- National Air Photo Library, Ottawa, Ontario.
- Intera Technologies Inc. *Inventory of Coal Gasification Plant Waste Sites in Ontario.* April 1987.
- Intera Technologies Inc. *Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario*. November 1988.
- "*Phase I Environmental Site Assessment, 2275 Mer Bleue Road, Ottawa, Ontario*", prepared by Paterson Group Inc. for Caivan Development Corporation, and dated September 30, 2020.
- "*Phase I Environmental Site Assessment, 2275 Mer Bleue Road, Ottawa, Ontario*" prepared by Pinchin for Broadstreet Properties Ltd., and dated April 1, 2022.

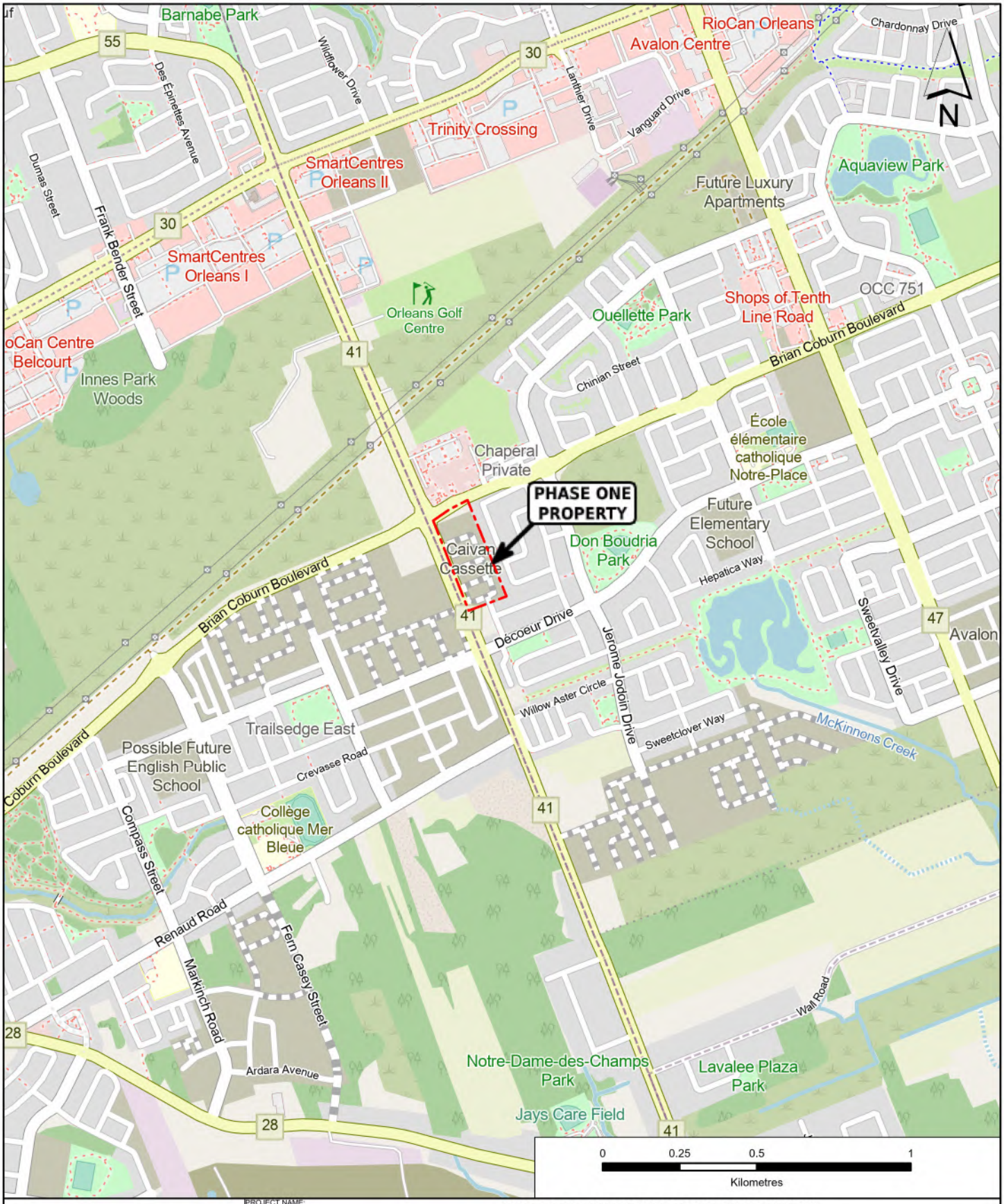
\\pinchin.com\Ott\Job\325000s\0325586.000 BroadstreetProp,2275MerBleueRd,EDR,PhOne\Deliverables\325586 Phase One ESA 2275 Mer Bleue Rd Ottawa ON BroadstreetProp.docx

Template: Master Report for RSC Phase One ESA Report, EDR, October 16, 2020

© 2023 Pinchin Ltd.

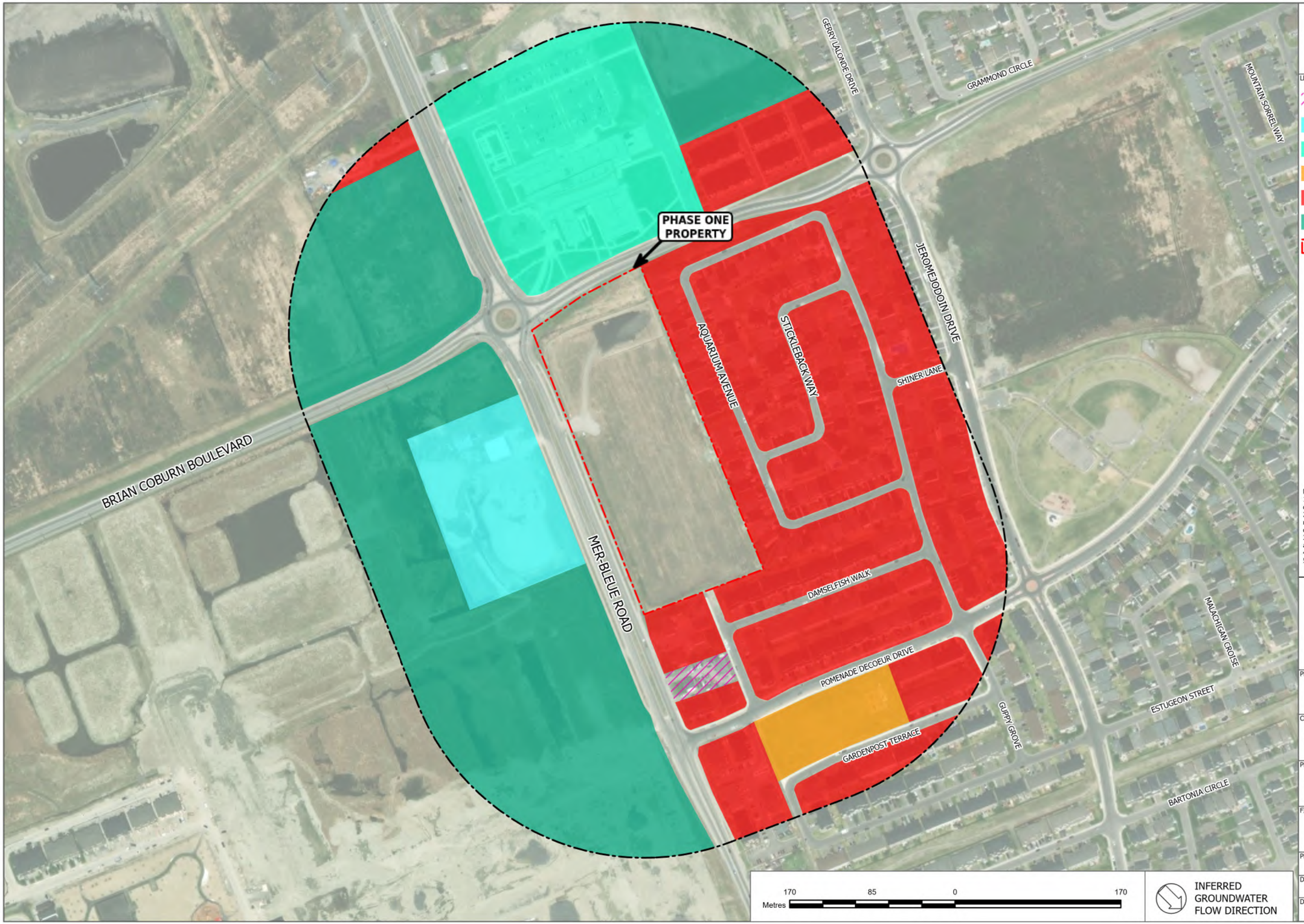
10.0 APPENDICES

APPENDIX A
Figures



PINCHIN

PROJECT NAME:	PHASE ONE ENVIRONMENTAL SITE ASSESSMENT				
CLIENT NAME:	BROADSTREET PROPERTIES LTD.				
PROJECT LOCATION:	2275 MER BLEUE ROAD, OTTAWA, ONTARIO				
FIGURE NAME:	KEY MAP				FIGURE NUMBER: 1
PROJECT NUMBER: 325586	SCALE: AS SHOWN	DRAWN BY: CF	REVIEWED BY: SB	DATE: MAY 2023	



N

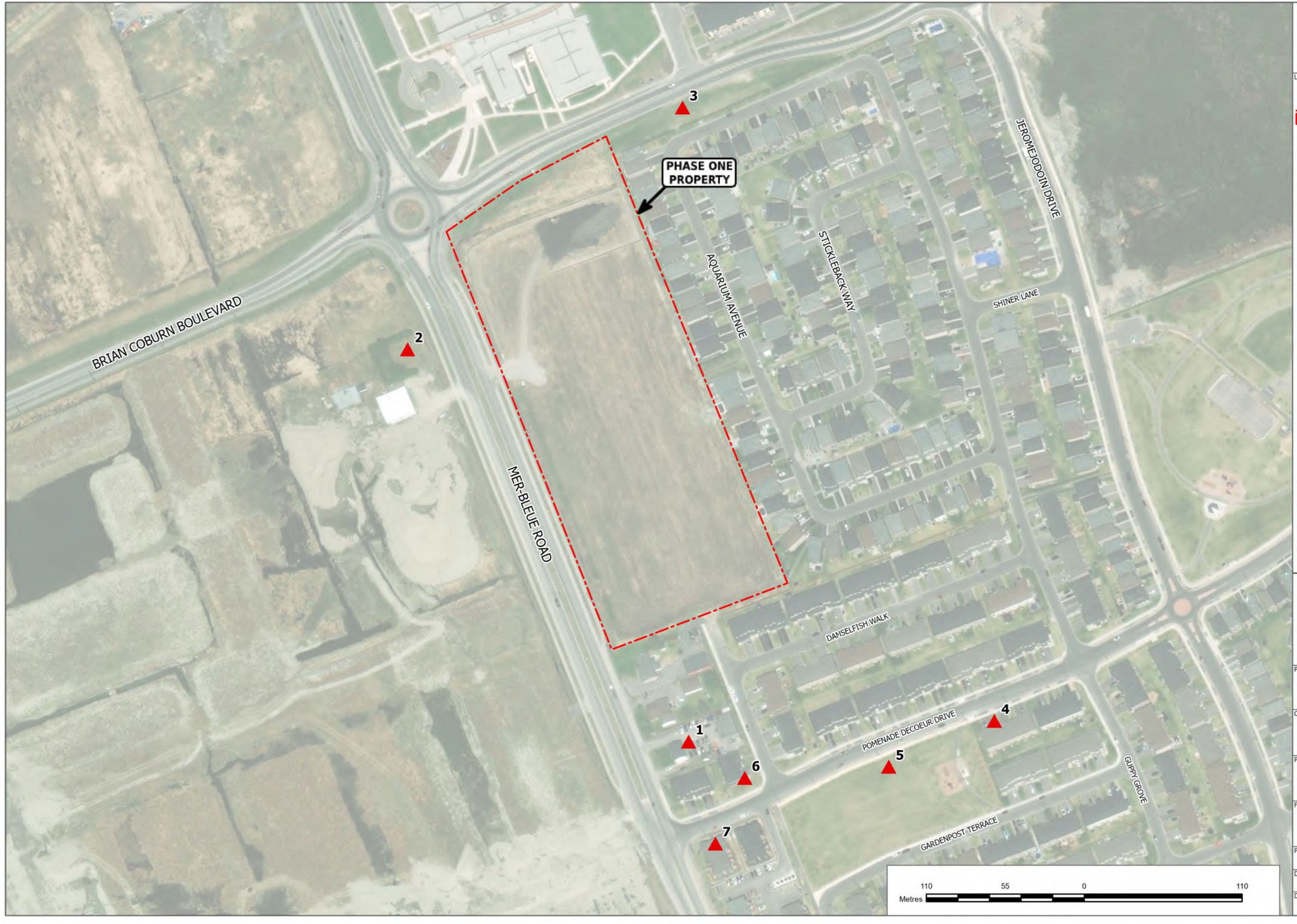
LEGEND

- AUTOMOTIVE REPAIR/ SERVICING FACILITY
- COMMERCIAL
- INSTITUTIONAL
- PARKLAND
- RESIDENTIAL
- VACANT
- PHASE ONE PROPERTY

NOTES:
1) Proprietary information may not be reproduced or divulged without prior written consent of Pinchin Ltd.
2) This drawing may have been reduced. All scale notations indicated are based on a 11"x17" format drawings.
3)Legend is color dependent. Non-colour copies may alter interpretation.
4) Coordinate system: NAD 1983 CSRS UTM Zone 18N.
5) Source: Pinchin Ltd., Maxar, Microsoft.

PINCHIN

PROJECT NAME	PHASE ONE ENVIRONMENTAL SITE ASSESSMENT
CLIENT NAME	BROADSTREET PROPERTIES LTD.
PROJECT LOCATION	2275 MER BLEUE ROAD, OTTAWA, ONTARIO
FIGURE NAME	PHASE ONE STUDY AREA
PROJECT NUMBER: 325586	SCALE AS SHOWN
DRAWN BY CF	REVIEWED BY SB
DATE MAY 2023	FIGURE NUMBER 2



N

LEGEND

PCA

PHASE ONE PROPERTY

NOTES:
1) Proprietary information may not be reproduced or divulged without prior written consent of Pinchin Ltd.
2) This drawing may have been reduced. All scale notations indicated are based on a 11"x17" format drawings.
3)Legend is color dependent. Non-colour copies may alter interpretation.
4) Coordinate system: NAD 1983 CSRS UTM Zone 18N.
5) Source: Pinchin Ltd., Maxar, Microsoft.

PINCHIN

PROJECT NAME
PHASE ONE ENVIRONMENTAL SITE ASSESSMENT

CLIENT NAME
BROADSTREET PROPERTIES LTD.

PROJECT LOCATION
2275 MER BLEUE ROAD, OTTAWA, ONTARIO

FIGURE NAME
POTENTIALLY CONTAMINATING ACTIVITIES

PROJECT NUMBER:	SCALE
325586	AS SHOWN
DRAWN BY: CF	REVIEWED BY: SB
DATE: MAY 2023	FIGURE NUMBER: 3

APPENDIX B
Photographs

Photo 1 – View from the north portion of the Phase One Property, looking south.

Photo 2 – View from the south portion of the Phase One Property, looking north.

© 2023 Pinchin Ltd.

Photo 3 – View from the east portion of the Phase One Property, looking west.

Photo 4 – View from the west portion of the Phase One Property, looking east.

© 2023 Pinchin Ltd.

Photo 5 – Property located north of the Phase One Property.

Photo 6 – Properties located south of the Phase One Property.

© 2023 Pinchin Ltd.

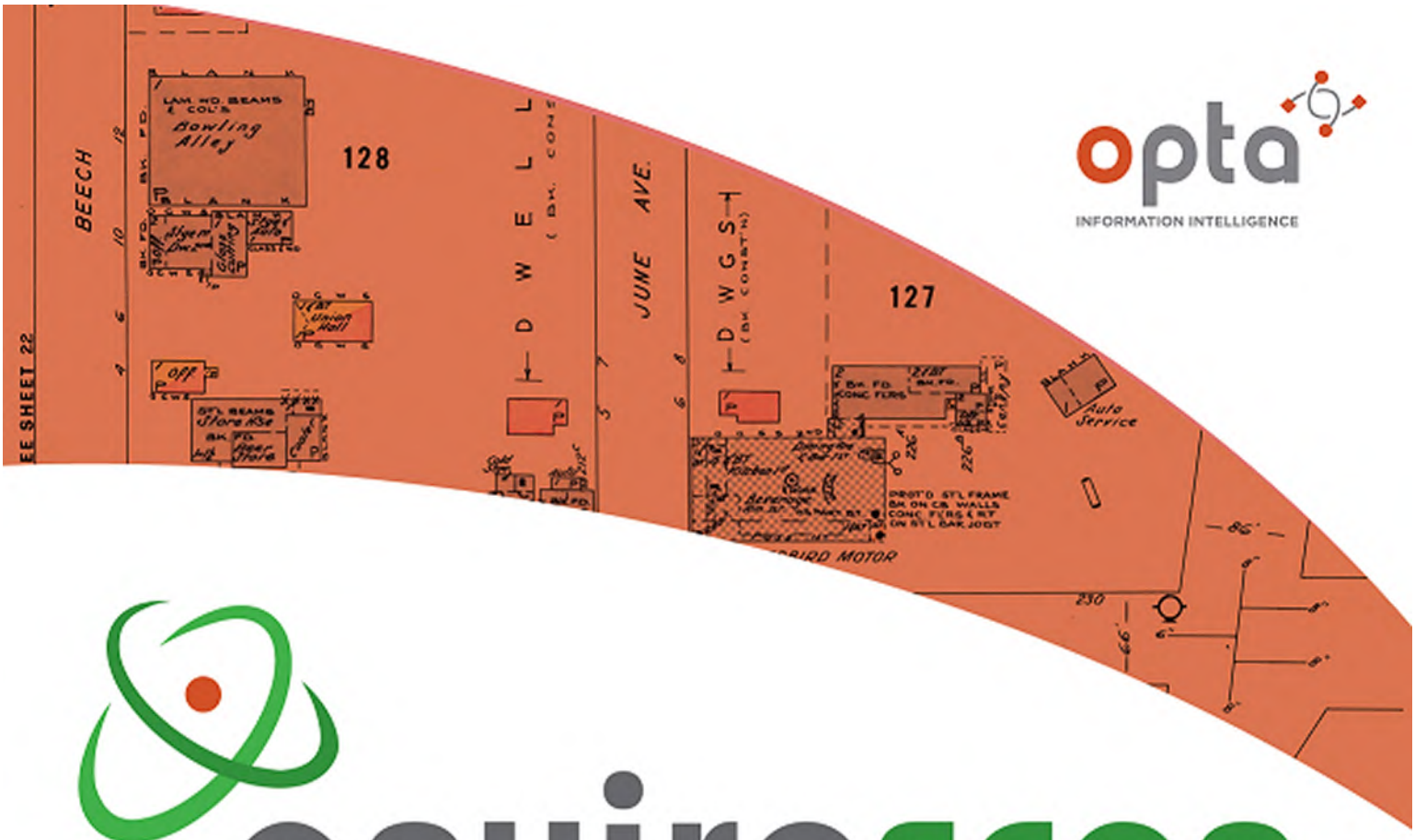
Photo 7 – Properties located east of the Phase One Property.

Photo 8 – Property located west of the Phase One Property.

© 2023 Pinchin Ltd.

APPENDIX C

Opta Records



opta
INFORMATION INTELLIGENCE

enviroscan

An SCM Company

175 Commerce Valley Drive W
Markham, Ontario L3T 7Z3

T: 905-882-6300
W: www.optaintel.ca

Report Completed By:

Midori

Site Address:

2275 Mer Bleue Road, Ottawa, ON

Project No:

22030800754

Opta Order ID:

106135

Requested by:

Eleanor Goolab
ERIS

Date Completed:

3/15/2022 6:39:35 AM

Project Name: 2275 Mer Bleue Road Ottawa

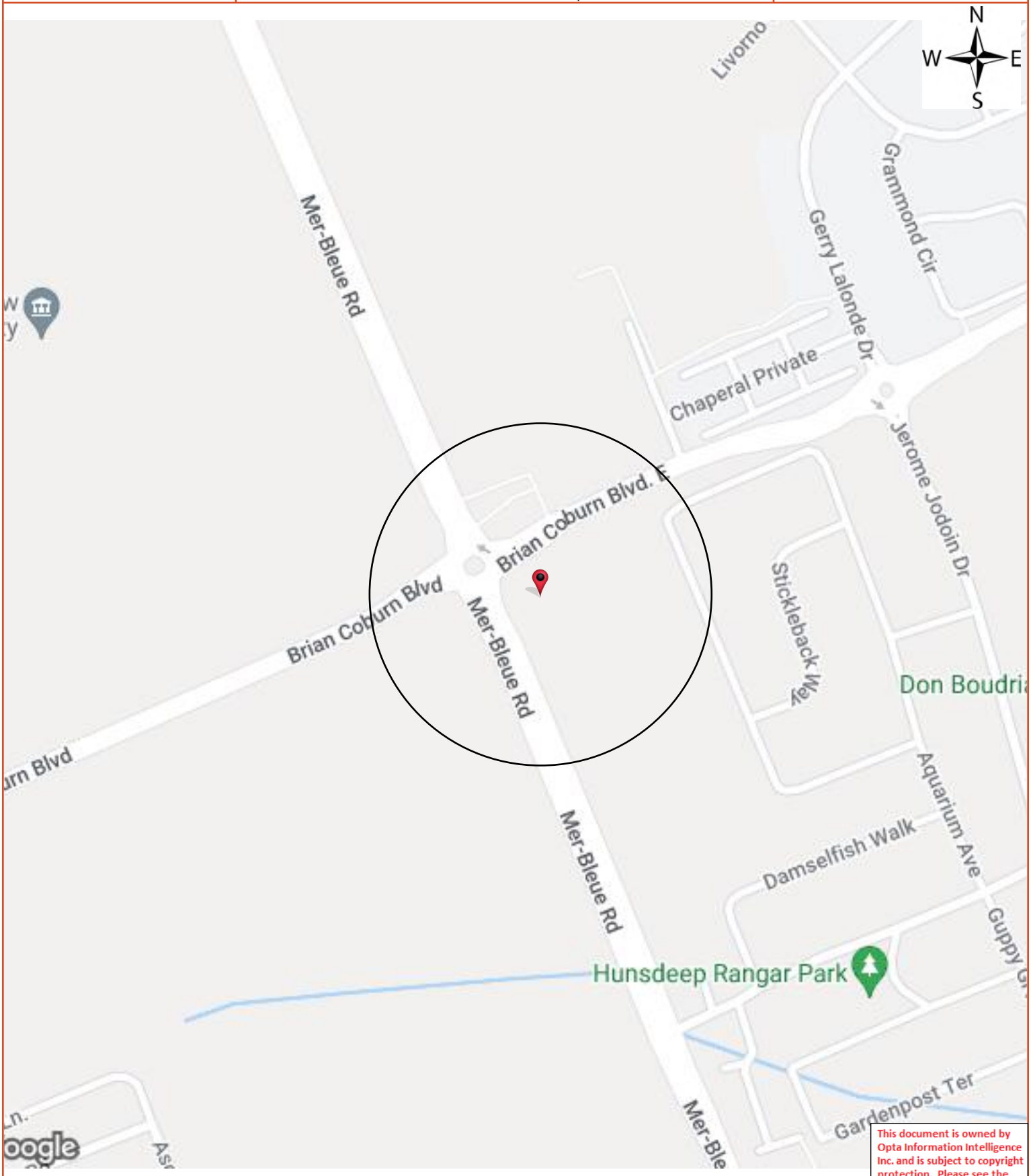
Project #: 22030800754
P.O. #: 307315

ENVIROSCAN Report

Search Area: 2275 Mer Bleue Road, Ottawa, ON

Requested by:
Eleanor Goolab
Date Completed: 03/15/2022 06:39:35

enviroscan
OPTA INFORMATION INTELLIGENCE



This document is owned by Opta Information Intelligence Inc. and is subject to copyright protection. Please see the full Terms and Conditions at the front of this document.

Opta Historical Environmental Services Enviroscan™ Terms and Conditions

Report

The documents (hereinafter referred to as the "Documents") to be released as part of the report (hereinafter referred to as the "Report") to be delivered to the purchaser as set out above are documents in Opta's records relating to the described property (hereinafter referred to as the "Property"). Opta makes no representations or warranties respecting the Documents whatsoever, including, without limitation, with respect to the completeness, accuracy or usefulness of the Documents, and does not represent or warrant that these are the only plans and reports prepared in association with the Property or in Opta's possession at the time of Report delivery to the purchaser. The Documents are current as of the date(s) indicated on them. Interpretation of the Documents, if any, is by inference based upon the information which is apparent and obvious on the face of the Documents only. Opta does not represent, warrant or guarantee that interpretations other than those referred to do not exist from other sources. The Report will be prepared for use by the purchaser of the services as shown above hereof only.

Disclaimer

Opta disclaims responsibility for any losses or damages of any kind whatsoever, whether consequential or other, however caused, incurred or suffered, arising directly or indirectly as a result of the services (which services include, but are not limited to, the preparation of the Report provided hereunder), including but not limited to, any losses or damages arising directly or indirectly from any breach of contract, fundamental or otherwise, from reliance on Opta Reports or from any tortious acts or omissions of Opta's agents, employees or representatives.

Entire Agreement

The parties hereto acknowledge and agree to be bound by the terms and conditions hereof. The request form constitutes the entire agreement between the parties pertaining to the subject matter hereof and supersedes all prior and contemporaneous agreements, negotiations and discussions, whether oral or written, and there are no representations or warranties, or other agreements between the parties in connection with the subject matter hereof except as specifically set forth herein. No supplement, modification, waiver, or termination of the request shall be binding, unless confirmed in writing by the parties hereto.

Governing Document

In the event of any conflicts or inconsistencies between the provisions hereof and the Reports, the rights and obligations of the parties shall be deemed to be governed by the request form, which shall be the paramount document.

Law

This agreement shall be governed by and construed in accordance with the laws of the Province of Ontario and the laws of Canada applicable therein.

Project Name: 2275 Mer Bleue Road Ottawa

Project #: 22030800754
P.O. #: 307315

ENVIROSCAN Report

No Records Found

Requested by:
Eleanor Goolab
Date Completed: 03/15/2022 06:39:35

enviroscan
OPTA INFORMATION INTELLIGENCE

No Records Found

This document is owned by Opta Information Intelligence Inc. and is subject to copyright protection. Please see the full Terms and Conditions at the front of this document.

N
W E
S

APPENDIX D

ERIS Report

DATABASE REPORT

Project Property:	*2275 Mer Bleue Road Ottawa ON* *2275 Mer-Bleue Rd* *Ottawa ON K4A*
Project No:	*325586*
Report Type:	*Quote - Custom-Build Your Own Report*
Order No:	*23042400186*
Requested by:	*Pinchin Ltd.*
Date Completed:	*April 27, 2023*

Environmental Risk Information Services
A division of Glacier Media Inc.
1.866.517.5204 | info@erisinfo.com | erisinfo.com

Table of Contents

Notice: IMPORTANT LIMITATIONS and YOUR LIABILITY

Reliance on information in Report: This report DOES NOT replace a full Phase I Environmental Site Assessment but is solely intended to be used as a database review of environmental records.

License for use of information in Report: No page of this report can be used without this cover page, this notice and the project property identifier. The information in Report(s) may not be modified or re-sold.

Your Liability for misuse: Using this Service and/or its reports in a manner contrary to this Notice or your agreement will be in breach of copyright and contract and ERIS may obtain damages for such mis-use, including damages caused to third parties, and gives ERIS the right to terminate your account, rescind your license to any previous reports and to bar you from future use of the Service.

No warranty of Accuracy or Liability for ERIS: The information contained in this report has been produced by ERIS Information Limited Partnership ("ERIS") using various sources of information, including information provided by Federal and Provincial government departments. The report applies only to the address and up to the date specified on the cover of this report, and any alterations or deviation from this description will require a new report. This report and the data contained herein does not purport to be and does not constitute a guarantee of the accuracy of the information contained herein and does not constitute a legal opinion nor medical advice. Although ERIS has endeavored to present you with information that is accurate, ERIS disclaims, any and all liability for any errors, omissions, or inaccuracies in such information and data, whether attributable to inadvertence, negligence or otherwise, and for any consequences arising therefrom. Liability on the part of ERIS is limited to the monetary value paid for this report.

Trademark and Copyright: You may not use the ERIS trademarks or attribute any work to ERIS other than as outlined above. This Service and Report (s) are protected by copyright owned by ERIS Information Limited Partnership. Copyright in data used in the Service or Report(s) (the "Data") is owned by ERIS or its licensors. The Service, Report(s) and Data may not be copied or reproduced in whole or in any substantial part without prior written consent of ERIS.

Executive Summary

Property Information:

Project Property:	*2275 Mer Bleue Road Ottawa ON* *2275 Mer-Bleue Rd Ottawa ON K4A*
Project No:	*325586*

Order Information:

Order No:	*23042400186*
Date Requested:	*April 24, 2023*
Requested by:	*Pinchin Ltd.*
Report Type:	*Quote - Custom-Build Your Own Report*

Historical/Products:

ERIS Xplorer	*ERIS Xplorer*
Topographic Map	*ANSI Map & Ontario Base Map (OBM)*

Executive Summary: Report Summary

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
AAGR	Abandoned Aggregate Inventory	Y	0	0	0
AGR	Aggregate Inventory	Y	0	0	0
AMIS	Abandoned Mine Information System	Y	0	0	0
ANDR	Anderson's Waste Disposal Sites	Y	0	0	0
AST	Aboveground Storage Tanks	Y	0	0	0
AUWR	Automobile Wrecking & Supplies	Y	0	0	0
BORE	Borehole	Y	0	3	3
CA	Certificates of Approval	Y	0	0	0
CDRY	Dry Cleaning Facilities	Y	0	0	0
CFOT	Commercial Fuel Oil Tanks	Y	0	0	0
CHEM	Chemical Manufacturers and Distributors	Y	0	0	0
CHM	Chemical Register	Y	0	0	0
CNG	Compressed Natural Gas Stations	Y	0	0	0
COAL	Inventory of Coal Gasification Plants and Coal Tar Sites	Y	0	0	0
CONV	Compliance and Convictions	Y	0	0	0
CPU	Certificates of Property Use	Y	0	0	0
DRL	Drill Hole Database	Y	0	0	0
DTNK	Delisted Fuel Tanks	Y	0	0	0
EASR	Environmental Activity and Sector Registry	Y	2	0	2
EBR	Environmental Registry	Y	0	0	0
ECA	Environmental Compliance Approval	Y	1	1	2
EEM	Environmental Effects Monitoring	Y	0	0	0
EHS	ERIS Historical Searches	Y	3	1	4
EIIS	Environmental Issues Inventory System	Y	0	0	0
EMHE	Emergency Management Historical Event	Y	0	0	0
EPAR	Environmental Penalty Annual Report	Y	0	0	0
EXP	List of Expired Fuels Safety Facilities	Y	0	0	0
FCON	Federal Convictions	Y	0	0	0
FCS	Contaminated Sites on Federal Land	Y	0	0	0
FOFT	Fisheries & Oceans Fuel Tanks	Y	0	0	0
FRST	Federal Identification Registry for Storage Tank Systems (FIRSTS)	Y	0	0	0
FST	Fuel Storage Tank	Y	0	0	0
FSTH	Fuel Storage Tank - Historic	Y	0	0	0
GEN	Ontario Regulation 347 Waste Generators Summary	Y	0	3	3
GHG	Greenhouse Gas Emissions from Large Facilities	Y	0	0	0
HINC	TSSA Historic Incidents	Y	0	0	0

Database	Name	Searched	Project Property	Boundary to 0.25km	Total
IAFT	Indian & Northern Affairs Fuel Tanks	Y	0	0	0
INC	Fuel Oil Spills and Leaks	Y	0	0	0
LIMO	Landfill Inventory Management Ontario	Y	0	0	0
MINE	Canadian Mine Locations	Y	0	0	0
MNR	Mineral Occurrences	Y	0	0	0
NATE	National Analysis of Trends in Emergencies System (NATES)	Y	0	0	0
NCPL	Non-Compliance Reports	Y	0	0	0
NDFT	National Defense & Canadian Forces Fuel Tanks	Y	0	0	0
NDSP	National Defense & Canadian Forces Spills	Y	0	0	0
NDWD	National Defence & Canadian Forces Waste Disposal Sites	Y	0	0	0
NEBI	National Energy Board Pipeline Incidents	Y	0	0	0
NEBP	National Energy Board Wells	Y	0	0	0
NEES	National Environmental Emergencies System (NEES)	Y	0	0	0
NPCB	National PCB Inventory	Y	0	0	0
NPRI	National Pollutant Release Inventory	Y	0	0	0
OGWE	Oil and Gas Wells	Y	0	0	0
OOGW	Ontario Oil and Gas Wells	Y	0	0	0
OPCB	Inventory of PCB Storage Sites	Y	0	0	0
ORD	Orders	Y	0	0	0
PAP	Canadian Pulp and Paper	Y	0	0	0
PCFT	Parks Canada Fuel Storage Tanks	Y	0	0	0
PES	Pesticide Register	Y	0	0	0
PINC	Pipeline Incidents	Y	0	1	1
PRT	Private and Retail Fuel Storage Tanks	Y	0	0	0
PTTW	Permit to Take Water	Y	0	0	0
REC	Ontario Regulation 347 Waste Receivers Summary	Y	0	0	0
RSC	Record of Site Condition	Y	0	0	0
RST	Retail Fuel Storage Tanks	Y	0	0	0
SCT	Scott's Manufacturing Directory	Y	0	0	0
SPL	Ontario Spills	Y	0	2	2
SRDS	Wastewater Discharger Registration Database	Y	0	0	0
TANK	Anderson's Storage Tanks	Y	0	0	0
TCFT	Transport Canada Fuel Storage Tanks	Y	0	0	0
VAR	Variances for Abandonment of Underground Storage Tanks	Y	0	0	0
WDS	Waste Disposal Sites - MOE CA Inventory	Y	0	0	0
WDSH	Waste Disposal Sites - MOE 1991 Historical Approval Inventory	Y	0	0	0
WWIS	Water Well Information System	Y	0	5	5
	Total:		6	16	22

Executive Summary: Site Report Summary - Project Property

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev diff (m)	Page Number
1	EASR	Caivan (Mer Bleue) Limited Partnership	2275 Mer Bleue RD Ottawa ON K4B 1H9	S/0.0	0.50	16
1	EHS		2075 Mer-Bleue Road Orléans ON K4A 3T9	S/0.0	0.50	16
1	EHS		2075 Mer-Bleue Road Orléans ON K4A 3T9	S/0.0	0.50	16
1	ECA	Caivan (Mer Bleu) Inc.	2275 Mer-Bleue Rd Ottawa ON K2H 1B2	S/0.0	0.50	16
1	EHS		2075 Mer-Bleue Road Orléans ON K4A 3T9	S/0.0	0.50	17
1	EASR	Caivan (Mer Bleue) Limited Partnership	2275 Mer Bleue RD Ottawa ON K4B 1H9	S/0.0	0.50	17

Executive Summary: Site Report Summary - Surrounding Properties

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
2	BORE		ON	SSW/1.0	-1.64	17
3	WWIS		lot 3 con 11 ON ***Well ID:*** 1512855	SSW/1.1	-1.64	18
4	WWIS		lot 3 con 11 ON ***Well ID:*** 1519531	SSW/4.4	-1.64	21
5	ECA	City of Ottawa	Mer Bleue Rd and Brian Coburn Blvd. Ottawa ON K2G 6J8	NW/36.4	-0.76	24
6	BORE		ON	SSE/61.7	-2.46	24
7	WWIS		2319 MERBLEUE ROAD lot 3 con 1 CUMBERLAND ON ***Well ID:*** 1536382	S/91.7	-2.43	25
8	GEN	Hopital Montfort Hospital	2225 chemin Mer Bleue Orleans ON K4A 3T8	NW/110.8	-0.75	32
9	PINC	PIPELINE HIT - 2"	519 CHAPERAL PRIVATE,,OTTAWA,ON, K4A 0Y2,CA ON	NNE/152.0	0.14	33
9	SPL		519 chaperal private Ottawa ON	NNE/152.0	0.14	33
9	SPL	Enbridge Gas Distribution Inc.	519 Chaperal Private, Orleans Ottawa ON	NNE/152.0	0.14	34
10	WWIS		lot 2 con 11 ON ***Well ID:*** 1512854	NW/161.4	-0.57	35
11	BORE		ON	NW/161.6	-0.57	38

Map Key	DB	Company/Site Name	Address	Dir/Dist (m)	Elev Diff (m)	Page Number
12	WWIS		2225 MER BLEUE Orl?ans ON ***Well ID:*** 7291135	NW/164.2	-0.94	39
13	EHS		2225 Mer Bleue Rd Ottawa ON K4A3T9	N/190.5	-0.64	42
14	GEN	Hopital Montfort Hospital	2225 chemin Mer Bleue Orleans ON K4A 3T8	N/218.7	-0.01	42
14	GEN	EllisDon Corporation	2225 Mer-Bleue Rd Ottawa ON K4A 3T9	N/218.7	-0.01	42

Executive Summary: Summary By Data Source

BORE - Borehole

A search of the BORE database, dated 1875-Jul 2018 has found that there are 3 BORE site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	ON	1.0	2
	ON	61.7	6
	ON	161.6	11

EASR - Environmental Activity and Sector Registry

A search of the EASR database, dated Oct 2011- Feb 28, 2023 has found that there are 2 EASR site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Caivan (Mer Bleue) Limited Partnership	2275 Mer Bleue RD Ottawa ON K4B 1H9	0.0	1
Caivan (Mer Bleue) Limited Partnership	2275 Mer Bleue RD Ottawa ON K4B 1H9	0.0	1

ECA - Environmental Compliance Approval

A search of the ECA database, dated Oct 2011- Feb 28, 2023 has found that there are 2 ECA site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Caivan (Mer Bleu) Inc.	2275 Mer-Bleue Rd Ottawa ON K2H 1B2	0.0	1

Site	Address	Distance (m)	Map Key
City of Ottawa	Mer Bleue Rd and Brian Coburn Blvd. Ottawa ON K2G 6J8	36.4	5

EHS - ERIS Historical Searches

A search of the EHS database, dated 1999-Dec 31, 2022 has found that there are 4 EHS site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	2075 Mer-Bleue Road Orléans ON K4A 3T9	0.0	1
	2075 Mer-Bleue Road Orléans ON K4A 3T9	0.0	1
	2075 Mer-Bleue Road Orléans ON K4A 3T9	0.0	1
	2225 Mer Bleue Rd Ottawa ON K4A3T9	190.5	13

GEN - Ontario Regulation 347 Waste Generators Summary

A search of the GEN database, dated 1986-Oct 31, 2022 has found that there are 3 GEN site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
Hopital Montfort Hospital	2225 chemin Mer Bleue Orleans ON K4A 3T8	110.8	8
EllisDon Corporation	2225 Mer-Bleue Rd Ottawa ON K4A 3T9	218.7	14
Hopital Montfort Hospital	2225 chemin Mer Bleue Orleans ON K4A 3T8	218.7	14

Site	Address	Distance (m)	Map Key

PINC - Pipeline Incidents

A search of the PINC database, dated Feb 28, 2021 has found that there are 1 PINC site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
PIPELINE HIT - 2"	519 CHAPERAL PRIVATE,,OTTAWA,ON, K4A 0Y2,CA ON	152.0	9

SPL - Ontario Spills

A search of the SPL database, dated 1988-Mar 2021; May 2021-Oct 2021 has found that there are 2 SPL site(s) within approximately 0.25 kilometers of the project property.

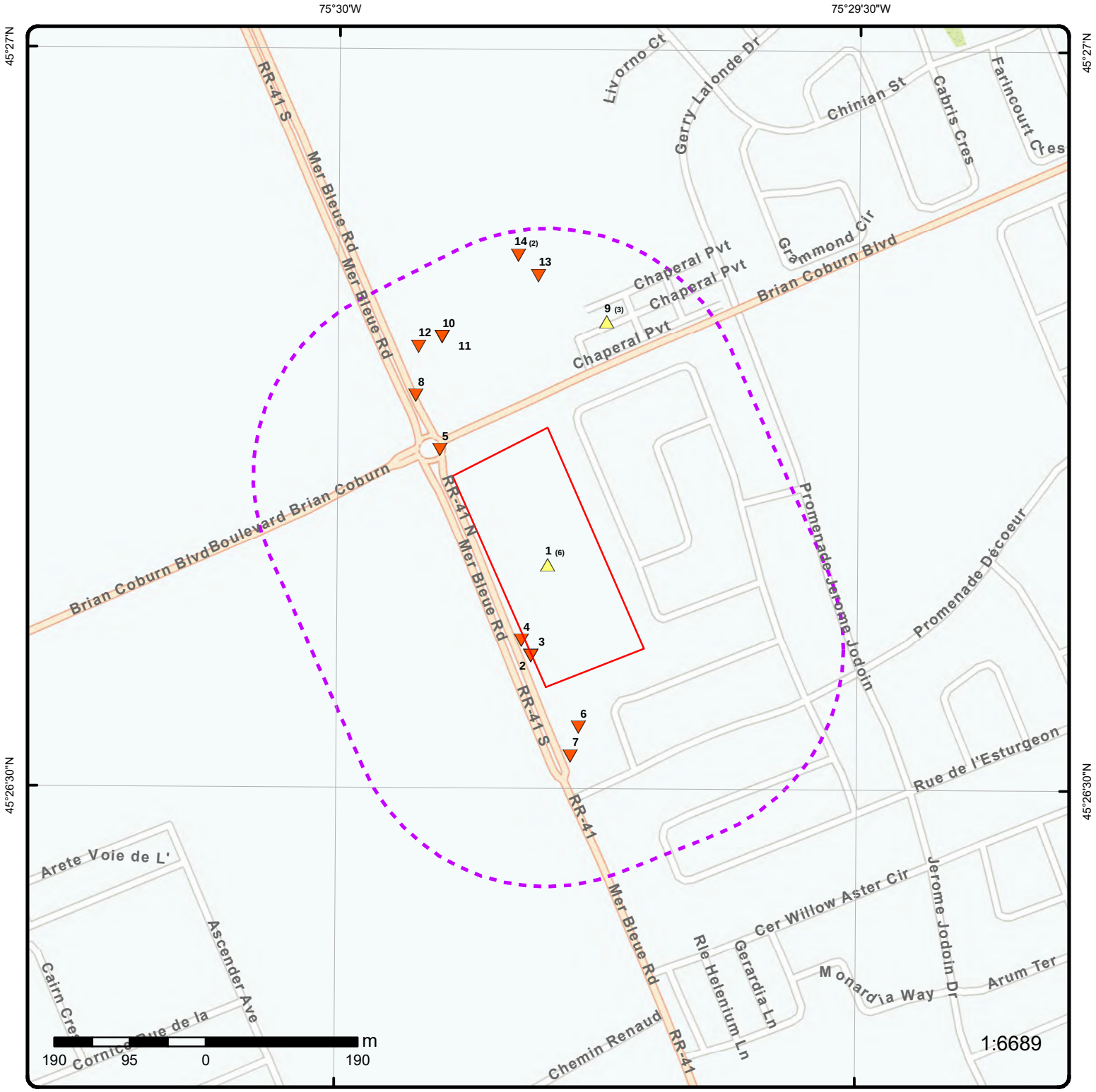
Site	Address	Distance (m)	Map Key
Enbridge Gas Distribution Inc.	519 Chaperal Private, Orleans Ottawa ON	152.0	9
	519 chaperal private Ottawa ON	152.0	9

WWIS - Water Well Information System

A search of the WWIS database, dated Jun 30 2022 has found that there are 5 WWIS site(s) within approximately 0.25 kilometers of the project property.

Site	Address	Distance (m)	Map Key
	lot 3 con 11 ON ***Well ID:*** 1512855	1.1	3
	lot 3 con 11 ON ***Well ID:*** 1519531	4.4	4
	2319 MERBLEUE ROAD lot 3 con 1 CUMBERLAND ON	91.7	7

Site	Address	Distance (m)	Map Key
	Well ID: 1536382		
	lot 2 con 11 ON ***Well ID:*** 1512854	161.4	10
	2225 MER BLEUE Orl?ans ON ***Well ID:*** 7291135	164.2	12



Map: 0.25 Kilometer Radius

Order Number: 23042400186

Address: 2275 Mer-Bleue Rd, Ottawa, ON

- Project Property
- Buffer Outline
- Eris Sites with Higher Elevation
- Eris Sites with Same Elevation
- Eris Sites with Lower Elevation
- Eris Sites with Unknown Elevation
- Freeways; Highways
- Traffic Circle; Ramp
- Major Arterial; Minor Arterial
- Local Road
- Service Road; Traffic Circle; Ramp
- Rail
- Beach
- Airport
- Industrial Area
- Military Base
- Aircraft Roads
- Native Reservation
- Hospital
- Shopping & Sports Area
- University/College
- Cemetery; Golf Course
- Parkt (National)
- Park (City/County)

Source: © 2021 ESRI StreetMap Premium.

© ERIS Information Limited Partnership

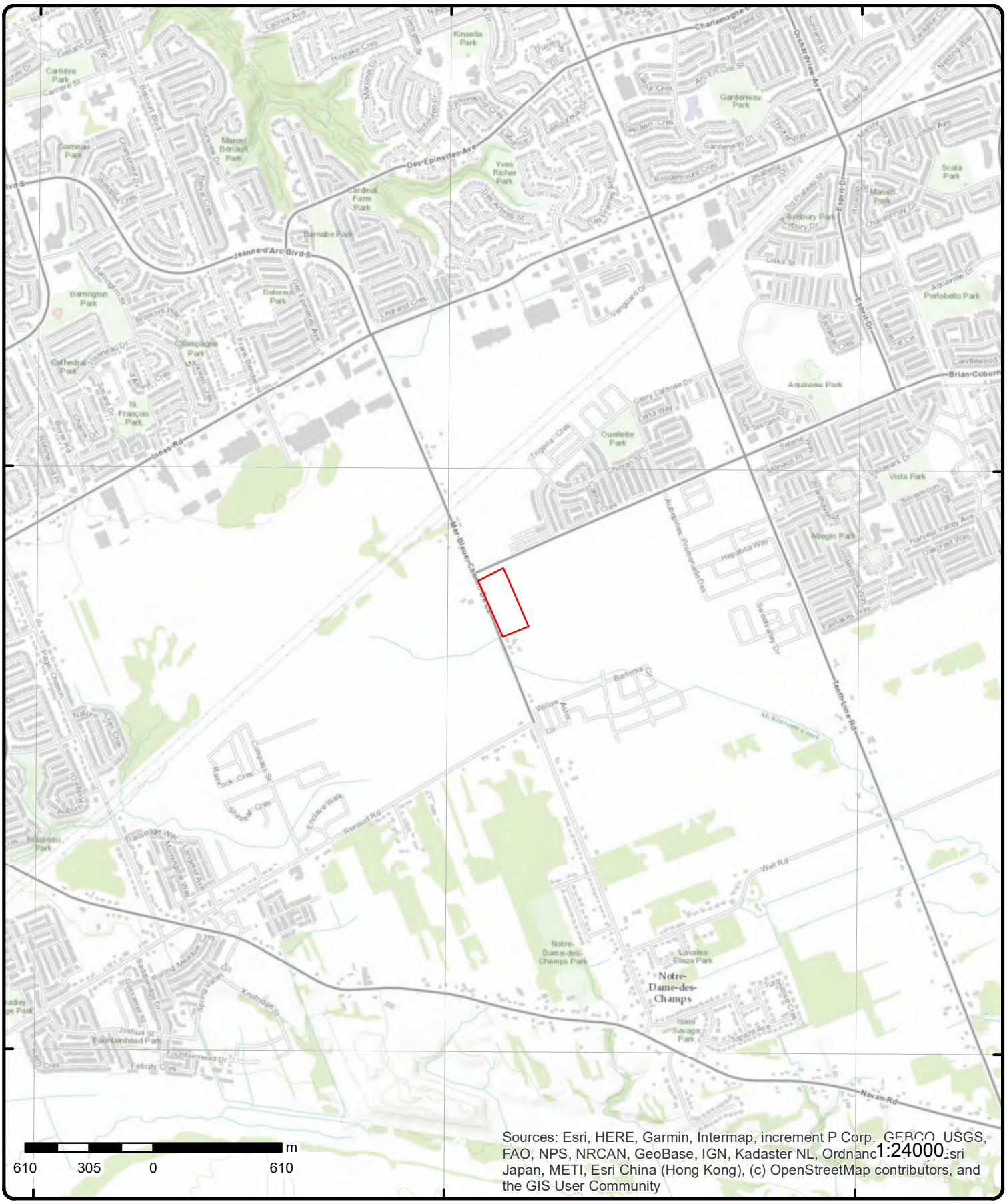
Aerial **Year: 2022**

Order Number: 23042400186

Address: 2275 Mer-Bleue Rd, Ottawa, ON

Source: ESRI World Imagery

© ERIS Information Limited Partnership



Topographic Map

Order Number: 23042400186

Address: 2275 Mer-Bleue Rd, ON

Source: ESRI World Topographic Map

© ERIS Information Limited Partnership

Detail Report

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	1 of 6	S/0.0	90.0 / 0.50	Caivan (Mer Bleue) Limited Partnership 2275 Mer Bleue RD Ottawa ON K4B 1H9	EASR

Approval No: R-009-8113219937
Status: REGISTERED
Date: 2021-05-28
Record Type: EASR
Link Source: MOFA
Project Type: Water Taking - Construction Dewatering
Full Address:
Approval Type: EASR-Water Taking - Construction Dewatering
SWP Area Name: South Nation
PDF URL:
PDF Site Location:
MOE District: Ottawa
Municipality: Ottawa
Latitude: 45.44444444
Longitude: -75.49666667
Geometry X: -8404250.4899
Geometry Y: 5691763.662

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	2 of 6	S/0.0	90.0 / 0.50	2075 Mer-Bleue Road Orléans ON K4A 3T9	EHS

Order No: 20292401100
Status: C
Report Type: Standard Report
Report Date: 29-SEP-20
Date Received: 24-SEP-20
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -75.496618
Y: 45.4441899

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	3 of 6	S/0.0	90.0 / 0.50	2075 Mer-Bleue Road Orléans ON K4A 3T9	EHS

Order No: 20292401100
Status: C
Report Type: Standard Report
Report Date: 29-SEP-20
Date Received: 24-SEP-20
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -75.496618
Y: 45.4441899

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
1	4 of 6	S/0.0	90.0 / 0.50	Caivan (Mer Bleu) Inc. 2275 Mer-Bleue Rd Ottawa ON K2H 1B2	ECA

Approval No: 1079-CHNKX4
Approval Date: September 1, 2022
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name: South Nation
MOE District: Ottawa
City:
Longitude:
Latitude:
Geometry X: -8399360.5957999993
Geometry Y: 5692599.4781000018

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Caivan (Mer Bleu) Inc.
Address: 2275 Mer-Bleue Rd
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/7159-CHEHZV-14.pdf
PDF Site Location: Cassette Subdivision
2275 Mer-Bleue Road
City of Ottawa, Ontario

---

1 | **5 of 6** | **S/0.0** | **90.0 / 0.50** | **2075 Mer-Bleue Road**
Orléans ON K4A 3T9 | **EHS**

Order No: 20292401100
Status: C
Report Type: Standard Report
Report Date: 29-SEP-20
Date Received: 24-SEP-20
Previous Site Name:
Lot/Building Size:
Additional Info Ordered:
Nearest Intersection:
Municipality:
Client Prov/State: ON
Search Radius (km): .25
X: -75.496618
Y: 45.4441899

---

1 | **6 of 6** | **S/0.0** | **90.0 / 0.50** | **Caivan (Mer Bleue) Limited Partnership**
2275 Mer Bleue RD
Ottawa ON K4B 1H9 | **EASR**

Approval No: R-009-8113219937
Status: REGISTERED
Date: February 22, 2023
Record Type: EASR
Link Source: MOFA
Project Type: Water Taking - Construction Dewatering
Full Address:
MOE District: Ottawa
Municipality: Ottawa
Latitude: 45.44444444
Longitude: -75.49666667
Geometry X: -8404250.4899000004
Geometry Y: 5691763.6619999995
Approval Type: EASR-Water Taking - Construction Dewatering
SWP Area Name: South Nation
PDF URL: http://www.accessenvironment.ene.gov.on.ca/AEWeb/ae/ViewDocument.action?documentRefID=2873870
PDF Site Location: 2275 Mer Bleue Road
Ottawa ON K4B 1H9

---

2 | **1 of 1** | **SSW/1.0** | **87.9 / -1.64** | **ON** | **BORE**

Borehole ID: 616285
OGF ID: 215517074
Status:
Type: Borehole
Use:
Completion Date: JUL-1962
Static Water Level: 3.7
Primary Water Use:
Sec. Water Use:
Total Depth m: 23.8
Depth Ref: Ground Surface
Depth Elev:
Drill Method:
Orig Ground Elev m: 87.5
Elev Reliabil Note:
DEM Ground Elev m: 88.4
Concession:
Location D:
Inclin FLG: No
SP Status: Initial Entry
Surv Elev: No
Piezometer: No
Primary Name:
Municipality:
Lot:
Township:
Latitude DD: 45.443163
Longitude DD: -75.496874
UTM Zone: 18
Easting: 461142
Northing: 5032302
Location Accuracy:
Accuracy: Not Applicable

Survey D:
Comments:

Borehole Geology Stratum

Geology Stratum ID:	218403561	***Mat Consistency:***	
Top Depth:	0	***Material Moisture:***	
Bottom Depth:	21.3	***Material Texture:***	
Material Color:	Blue	***Non Geo Mat Type:***	
Material 1:	Clay	***Geologic Formation:***	
Material 2:		***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	CLAY. BLUE.		

Geology Stratum ID:	218403562	***Mat Consistency:***	
Top Depth:	21.3	***Material Moisture:***	
Bottom Depth:	23.8	***Material Texture:***	
Material Color:	Blue	***Non Geo Mat Type:***	
Material 1:	Gravel	***Geologic Formation:***	
Material 2:		***Geologic Group:***	
Material 3:		***Geologic Period:***	
Material 4:		***Depositional Gen:***	
Gsc Material Description:			
Stratum Description:	GRAVEL. 00078BLE AT 275.0 FEET.. CLAY. BLUE. GRAVEL. LIMESTONE. GREY. 00122 18000 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Source

Source Type:	Data Survey	***Source Appl:***	Spatial/Tabular
Source Orig:	Geological Survey of Canada	***Source Iden:***	1
Source Date:	1956-1972	***Scale or Res:***	Varies
Confidence:		***Horizontal:***	NAD27
Observatio:		***Verticalda:***	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OTTAWA2.txt RecordID: 08793 NTS_Sheet:		
Confiden 1:			

Source List

Source Identifier:	1	***Horizontal Datum:***	NAD27
Source Type:	Data Survey	***Vertical Datum:***	Mean Average Sea Level
Source Date:	1956-1972	***Projection Name:***	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
3	1 of 1	SSW/1.1	87.9 / -1.64	lot 3 con 11 ON	WWIS

Well ID:	1512855	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:	0	***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	05-Sep-1962 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:		***Contractor:***	1504
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON

Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	11
Well Depth:		***Concession Name:***	CON
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/151\1512855.pdf

Additional Detail(s) (Map)

Well Completed Date:	1962/07/30
Year Completed:	1962
Depth (m):	23.7744
Latitude:	45.4431614608943
Longitude:	-75.4968738977851
Path:	151\1512855.pdf

Bore Hole Information

Bore Hole ID:	10034843	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	461141.80
Code OB Desc:		***North83:***	5032302.00
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	5
Date Completed:	30-Jul-1962 00:00:00	***UTMRC Desc:***	margin of error : 100 m - 300 m
Remarks:		***Location Method:***	p5
Loc Method Desc:	Original Pre1985 UTM Rel Code 5: margin of error : 100 m - 300 m		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931021736
Layer:	2
Color:	
General Color:	
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	70.0
Formation End Depth:	78.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931021735
Layer:	1

Color:	3
General Color:	BLUE
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	70.0
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961512855
Method Construction Code:	7
Method Construction:	Diamond
Other Method Construction:	

Pipe Information

Pipe ID:	10583413
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930061715
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	78.0
Casing Diameter:	2.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	PUMP
Pump Test ID:	991512855
Pump Set At:	
Static Level:	2.0
Final Level After Pumping:	20.0
Recommended Pump Depth:	20.0
Pumping Rate:	8.0
Flowing Rate:	
Recommended Pump Rate:	8.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	2
Pumping Duration MIN:	0
Flowing:	No

Water Details

Water ID:	933468345

Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	78.0
Water Found Depth UOM:	ft

Links

Bore Hole ID:	10034843	**Tag No:**	
Depth M:	23.7744	**Contractor:**	1504
Year Completed:	1962	**Path:**	151\1512855.pdf
Well Completed Dt:	1962/07/30	**Latitude:**	45.4431614608943
Audit No:		**Longitude:**	-75.4968738977851

---

4 | ***1 of 1*** | ***SSW/4.4*** | ***87.9 / -1.64*** | ***lot 3 con 11 ON*** | ***WWIS***

Well ID:	1519531	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Irrigation	**Data Entry Status:**	
Use 2nd:	0	**Data Src:**	1
Final Well Status:	Water Supply	**Date Received:**	19-Apr-1985 00:00:00
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:		**Contractor:**	2351
Tag:		**Form Version:**	1
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	OTTAWA-CARLETON
Elevatn Reliabilty:		**Lot:**	003
Depth to Bedrock:		**Concession:**	11
Well Depth:		**Concession Name:**	CON
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/151\1519531.pdf

Additional Detail(s) (Map)

Well Completed Date:	1985/03/25
Year Completed:	1985
Depth (m):	36.576
Latitude:	45.4433318101796
Longitude:	-75.4970288358745
Path:	151\1519531.pdf

Bore Hole Information

Bore Hole ID:	10041401	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	461129.80
Code OB Desc:		**North83:**	5032321.00
Open Hole:		**Org CS:**	
Cluster Kind:		**UTMRC:**	4
Date Completed:	25-Mar-1985 00:00:00	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	p4
Loc Method Desc:	Original Pre1985 UTM Rel Code 4: margin of error : 30 m - 100 m		
Elevrc Desc:			

Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931041959
Layer: 3
Color: 8
General Color: BLACK
Mat1: 11
Most Common Material: GRAVEL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 119.0
Formation End Depth: 120.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931041957
Layer: 1
Color: 6
General Color: BROWN
Mat1: 02
Most Common Material: TOPSOIL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 6.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931041958
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 6.0
Formation End Depth: 119.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961519531
Method Construction Code: 1

Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10589971
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930072292
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 120.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991519531
Pump Set At:
Static Level: 45.0
Final Level After Pumping: 105.0
Recommended Pump Depth: 116.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 14.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934653315
Test Type: Draw Down
Test Duration: 45
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934383338
Test Type: Draw Down
Test Duration: 30
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934109164

Test Type:	Draw Down
Test Duration:	15
Test Level:	90.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934894077
Test Type:	Draw Down
Test Duration:	60
Test Level:	105.0
Test Level UOM:	ft

Water Details

Water ID:	933476558
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	120.0
Water Found Depth UOM:	ft

Links

Bore Hole ID:	10041401	**Tag No:**	
Depth M:	36.576	**Contractor:**	2351
Year Completed:	1985	**Path:**	151\1519531.pdf
Well Completed Dt:	1985/03/25	**Latitude:**	45.4433318101796
Audit No:		**Longitude:**	-75.4970288358745

---

5 | ***1 of 1*** | ***NW/36.4*** | ***88.8 / -0.76*** | ***City of Ottawa***
Mer Bleue Rd and Brian Coburn Blvd.
Ottawa ON K2G 6J8 | ***ECA***

Approval No:	6579-9X5SCM	**MOE District:**	
Approval Date:	2015-06-15	**City:**	
Status:	Approved	**Longitude:**	
Record Type:	ECA	**Latitude:**	
Link Source:	IDS	**Geometry X:**	
SWP Area Name:		**Geometry Y:**	

Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name:	City of Ottawa
Address:	Mer Bleue Rd and Brian Coburn Blvd.
Full Address:	
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/8616-9X3Q6H-14.pdf
PDF Site Location:	

---

6 | ***1 of 1*** | ***SSE/61.7*** | ***87.1 / -2.46*** | ***ON*** | ***BORE***

Borehole ID:	616284	**Inclin FLG:**	No
OGF ID:	215517073	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:		**Primary Name:**	
Completion Date:	JUL-1962	**Municipality:**	
Static Water Level:	3.0	**Lot:**	
Primary Water Use:		**Township:**	
Sec. Water Use:		**Latitude DD:**	45.442356
Total Depth m:	-999	**Longitude DD:**	-75.496112

Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	461201
Drill Method:		**Northing:**	5032212
Orig Ground Elev m:	86.9	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	88.4		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218403560	**Mat Consistency:**	
Top Depth:	21.3	**Material Moisture:**	
Bottom Depth:		**Material Texture:**	
Material Color:	Blue	**Non Geo Mat Type:**	
Material 1:	Gravel	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	GRAVEL. WATER STABLE AT 275.0 FEET.. CLAY. BLUE. GRAVEL. LIMESTONE. GREY. 00122 18000 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Geology Stratum ID:	218403559	**Mat Consistency:**	
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	21.3	**Material Texture:**	
Material Color:	Blue	**Non Geo Mat Type:**	
Material 1:	Clay	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	CLAY. BLUE.		

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:	M	**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OTTAWA2.txt RecordID: 087920 NTS_Sheet: 31G06E		
Confiden 1:	Reliable information but incomplete.		

Source List

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

7	***1 of 1***	***S/91.7***	***87.1 / -2.43***	***2319 MERBLEUE ROAD lot 3 con 1 CUMBERLAND ON***	***WWIS***

Well ID:	1536382	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Domestic	**Data Entry Status:**	

Use 2nd:		**Data Src:**	
Final Well Status:	Water Supply	**Date Received:**	12-Jun-2006 00:00:00
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z39926	**Contractor:**	1119
Tag:	A023034	**Form Version:**	3
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	OTTAWA-CARLETON
Elevatn Reliabilty:		**Lot:**	003
Depth to Bedrock:		**Concession:**	01
Well Depth:		**Concession Name:**	CON
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/153\1536382.pdf

Additional Detail(s) (Map)

Well Completed Date:	2006/05/05
Year Completed:	2006
Depth (m):	103.63
Latitude:	45.4420300837747
Longitude:	-75.4962348658538
Path:	153\1536382.pdf

Bore Hole Information

Bore Hole ID:	11550448	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	461191.00
Code OB Desc:		**North83:**	5032176.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	3
Date Completed:	05-May-2006 00:00:00	**UTMRC Desc:**	margin of error : 10 - 30 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	933055409
Layer:	1
Color:	
General Color:	
Mat1:	28
Most Common Material:	SAND
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	3.3499999046325684

Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 933055410
Layer: 2
Color:
General Color:
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 3.3499999046325684
Formation End Depth: 23.770000457763672
Formation End Depth UOM: m

Overburden and Bedrock Materials Interval

Formation ID: 933055411
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 23.770000457763672
Formation End Depth: 103.62999725341797
Formation End Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933294365
Layer: 1
Plug From: 24.079999923706055
Plug To: 21.030000686645508
Plug Depth UOM: m

Annular Space/Abandonment Sealing Record

Plug ID: 933294366
Layer: 2
Plug From: 21.030000686645508
Plug To: 0.0
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 961536382
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID:	11560055
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930880319
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	24.079999923706055
Depth To:	103.62999725341797
Casing Diameter:	
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Construction Record - Casing

Casing ID:	930880318
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	0.0
Depth To:	24.690000534057617
Casing Diameter:	15.880000114440918
Casing Diameter UOM:	cm
Casing Depth UOM:	m

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	11569464
Pump Set At:	91.44000244140625
Static Level:	1.25
Final Level After Pumping:	56.380001068115234
Recommended Pump Depth:	91.44000244140625
Pumping Rate:	22.739999771118164
Flowing Rate:	
Recommended Pump Rate:	22.709999084472656
Levels UOM:	m
Rate UOM:	LPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	

Draw Down & Recovery

Pump Test Detail ID:	11630875
Test Type:	Draw Down
Test Duration:	1
Test Level:	2.119999885559082
Test Level UOM:	m

Draw Down & Recovery

Pump Test Detail ID: 11630877
Test Type: Draw Down
Test Duration: 2
Test Level: 3.2100000381469727
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630880
Test Type: Recovery
Test Duration: 3
Test Level: 54.900001525878906
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630887
Test Type: Draw Down
Test Duration: 15
Test Level: 15.949999809265137
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631167
Test Type: Recovery
Test Duration: 25
Test Level: 46.900001525878906
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630883
Test Type: Draw Down
Test Duration: 5
Test Level: 6.25
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630886
Test Type: Recovery
Test Duration: 10
Test Level: 52.7599983215332
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630890
Test Type: Recovery
Test Duration: 20
Test Level: 48.79999923706055
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631173
Test Type: Recovery
Test Duration: 50
Test Level: 37.900001525878906

Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630876
Test Type: Recovery
Test Duration: 1
Test Level: 55.150001525878906
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631169
Test Type: Recovery
Test Duration: 30
Test Level: 45.29999923706055
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630882
Test Type: Recovery
Test Duration: 4
Test Level: 54.560001373291016
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631171
Test Type: Recovery
Test Duration: 40
Test Level: 41.0
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630884
Test Type: Recovery
Test Duration: 5
Test Level: 54.25
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630888
Test Type: Recovery
Test Duration: 15
Test Level: 50.79999923706055
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630889
Test Type: Draw Down
Test Duration: 20
Test Level: 20.649999618530273
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631166
Test Type: Draw Down
Test Duration: 25
Test Level: 23.729999542236328
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631168
Test Type: Draw Down
Test Duration: 30
Test Level: 26.719999313354492
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631170
Test Type: Draw Down
Test Duration: 40
Test Level: 33.400001525878906
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631175
Test Type: Recovery
Test Duration: 60
Test Level: 35.099998474121094
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630878
Test Type: Recovery
Test Duration: 2
Test Level: 55.0
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630879
Test Type: Draw Down
Test Duration: 3
Test Level: 4.25
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631172
Test Type: Draw Down
Test Duration: 50
Test Level: 42.70000076293945
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11631174
Test Type: Draw Down
Test Duration: 60

Test Level: 56.380001068115234
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630881
Test Type: Draw Down
Test Duration: 4
Test Level: 5.25
Test Level UOM: m

Draw Down & Recovery

Pump Test Detail ID: 11630885
Test Type: Draw Down
Test Duration: 10
Test Level: 10.850000381469727
Test Level UOM: m

Water Details

Water ID: 934076133
Layer: 1
Kind Code:
Kind:
Water Found Depth: 99.05999755859375
Water Found Depth UOM: m

Hole Diameter

Hole ID: 11681155
Diameter: 15.229999542236328
Depth From: 0.0
Depth To: 103.62999725341797
Hole Depth UOM: m
Hole Diameter UOM: cm

Links

Bore Hole ID: 11550448
Depth M: 103.63
Year Completed: 2006
Well Completed Dt: 2006/05/05
Audit No: Z39926
Tag No: A023034
Contractor: 1119
Path: 153\1536382.pdf
Latitude: 45.4420300837747
Longitude: -75.4962348658538

---

8 | ***1 of 1*** | ***NW/110.8*** | ***88.8 / -0.75*** | ***Hopital Montfort Hospital***
2225 chemin Mer Bleue
Orleans ON K4A 3T8 | ***GEN***

Generator No: ON3529500
SIC Code:
SIC Description:
Approval Years: As of Oct 2022
PO Box No:
Country: Canada
Status: Registered
Co Admin:
Choice of Contact:
Phone No Admin:
Contaminated Facility:
MHSW Facility:

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Detail(s)

Waste Class: 261 A
Waste Class Name: PHARMACEUTICALS

Waste Class: 312 P
Waste Class Name: PATHOLOGICAL WASTES

---

9 | ***1 of 3*** | ***NNE/152.0*** | ***89.7 / 0.14*** | ***PIPELINE HIT - 2" 519 CHAPERAL PRIVATE,,OTTAWA,ON,K4A 0Y2,CA ON*** | ***PINC***

Incident Id:
Incident No: 1729458
Incident Reported Dt: 9/30/2015
Type: FS-Pipeline Incident
Status Code:
Tank Status: Pipeline Damage Reason Est
Task No:
Spills Action Centre:
Fuel Type:
Fuel Occurrence Tp:
Date of Occurrence:
Occurrence Start Dt:
Depth:
Customer Acct Name: PIPELINE HIT - 2"
Incident Address: 519 CHAPERAL PRIVATE,,OTTAWA,ON,K4A 0Y2,CA
Operation Type:
Pipeline Type:
Regulator Type:
Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Notes:

Pipe Material:
Fuel Category:
Health Impact:
Environment Impact:
Property Damage:
Service Interrupt:
Enforce Policy:
Public Relation:
Pipeline System:
PSIG:
Attribute Category:
Regulator Location:
Method Details:

---

9 | ***2 of 3*** | ***NNE/152.0*** | ***89.7 / 0.14*** | ***519 chaperal private Ottawa ON*** | ***SPL***

Ref No: 2052-A2UKLH
Site No: NA
Incident Dt: 9/30/2015
Year:
Incident Cause:
Incident Event:
Environment Impact:
Nature of Impact:
MOE Response: No
Dt MOE Arvl on Scn:
MOE Reported Dt: 9/30/2015
Dt Document Closed: 11/27/2015
Municipality No:
System Facility Address:
Client Type:
Call Report Location Geodata:
Contaminant Code: 35
Contaminant Name: NATURAL GAS (METHANE)
Contaminant Limit 1:
Contam Limit Freq 1:

Contaminant Qty: 0 other - see incident description
Nature of Damage:
Discharger Report:
Material Group:
Health/Env Conseq:
Agency Involved:
Site Lot:
Site Conc:
Site Geo Ref Accu:
Site Map Datum:
Northing:
Easting:

Contaminant UN No 1:	
Receiving Medium:	
Receiving Environment:	
Incident Reason:	Operator/Human Error
Incident Summary:	TSSA: Chaperal service damage
Site Region:	
Site Municipality:	Ottawa
Activity Preceding Spill:	
Property 2nd Watershed:	
Property Tertiary Watershed:	
Sector Type:	Miscellaneous Industrial
SAC Action Class:	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill
Source Type:	
Site County/District:	
Site Geo Ref Meth:	
Site District Office:	
Nearest Watercourse:	
Site Name:	pipeline<UNOFFICIAL>
Site Address:	519 chaperal private

---

9 | ***3 of 3*** | ***NNE/152.0*** | ***89.7 / 0.14*** | ***Enbridge Gas Distribution Inc.***
519 Chaperal Private, Orleans
Ottawa ON | ***SPL***

Ref No:	4805-A2VGEH	**Contaminant Qty:**	0 other - see incident description
Site No:	NA	**Nature of Damage:**	
Incident Dt:	9/30/2015	**Discharger Report:**	
Year:		**Material Group:**	
Incident Cause:		**Health/Env Conseq:**	
Incident Event:		**Agency Involved:**	
Environment Impact:		**Site Lot:**	
Nature of Impact:		**Site Conc:**	
MOE Response:	No	**Site Geo Ref Accu:**	
Dt MOE Arvl on Scn:		**Site Map Datum:**	
MOE Reported Dt:	10/1/2015	**Northing:**	
Dt Document Closed:	10/3/2015	**Easting:**	
Municipality No:			
System Facility Address:			
Client Type:			
Call Report Location Geodata:			
Contaminant Code:	35		
Contaminant Name:	NATURAL GAS (METHANE)		
Contaminant Limit 1:			
Contam Limit Freq 1:			
Contaminant UN No 1:			
Receiving Medium:			
Receiving Environment:			
Incident Reason:	Operator/Human Error		
Incident Summary:	TSSA/Enbridge: 2 " gasline damage		
Site Region:			
Site Municipality:	Ottawa		
Activity Preceding Spill:			
Property 2nd Watershed:			
Property Tertiary Watershed:			
Sector Type:	Unknown / N/A		
SAC Action Class:	TSSA - Fuel Safety Branch - Hydrocarbon Fuel Release/Spill		
Source Type:			
Site County/District:			
Site Geo Ref Meth:			
Site District Office:			
Nearest Watercourse:			
Site Name:	Enbridge - gasline<UNOFFICIAL>		
Site Address:	519 Chaperal Private, Orleans		

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
10	1 of 1	NW/161.4	89.0 / -0.57	lot 2 con 11 ON	WWIS

Well ID: 1512854
Construction Date:
Use 1st: Livestock
Use 2nd: 0
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 30-Jul-1970 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1504
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession: 11
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/151\1512854.pdf

Additional Detail(s) (Map)

Well Completed Date: 1969/07/15
Year Completed: 1969
Depth (m): 14.6304
Latitude: 45.4467556308851
Longitude: -75.4983248825397
Path: 151\1512854.pdf

Bore Hole Information

Bore Hole ID: 10034842
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 15-Jul-1969 00:00:00
Remarks:
Loc Method Desc: Original Pre1985 UTM Rel Code 4: margin of error : 30 m - 100 m
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83: 461030.80
North83: 5032702.00
Org CS:
UTMRC: 4
UTMRC Desc: margin of error : 30 m - 100 m
Location Method: p4

Overburden and Bedrock Materials Interval

Formation ID: 931021733
Layer: 1
Color: 3
General Color: BLUE

Mat1:	05
Most Common Material:	CLAY
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	40.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931021734
Layer:	2
Color:	2
General Color:	GREY
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	40.0
Formation End Depth:	48.0
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961512854
Method Construction Code:	7
Method Construction:	Diamond
Other Method Construction:	

Pipe Information

Pipe ID:	10583412
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930061714
Layer:	1
Material:	2
Open Hole or Material:	GALVANIZED
Depth From:	
Depth To:	48.0
Casing Diameter:	2.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	PUMP
Pump Test ID:	991512854
Pump Set At:	
Static Level:	2.0
Final Level After Pumping:	20.0
Recommended Pump Depth:	25.0

Pumping Rate:	10.0
Flowing Rate:	
Recommended Pump Rate:	6.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	2
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934378002
Test Type:	Draw Down
Test Duration:	30
Test Level:	20.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934639000
Test Type:	Draw Down
Test Duration:	45
Test Level:	20.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934098889
Test Type:	Draw Down
Test Duration:	15
Test Level:	20.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934896482
Test Type:	Draw Down
Test Duration:	60
Test Level:	20.0
Test Level UOM:	ft

Water Details

Water ID:	933468344
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	48.0
Water Found Depth UOM:	ft

Links

Bore Hole ID:	10034842	***Tag No:***	
Depth M:	14.6304	***Contractor:***	1504
Year Completed:	1969	***Path:***	151\1512854.pdf
Well Completed Dt:	1969/07/15	***Latitude:***	45.4467556308851
Audit No:		***Longitude:***	-75.4983248825397

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB
11	1 of 1	NW/161.6	89.0 / -0.57	ON	BORE

Borehole ID:	616290	**Inclin FLG:**	No
OGF ID:	215517079	**SP Status:**	Initial Entry
Status:		**Surv Elev:**	No
Type:	Borehole	**Piezometer:**	No
Use:		**Primary Name:**	
Completion Date:	JUL-1969	**Municipality:**	
Static Water Level:		**Lot:**	
Primary Water Use:		**Township:**	
Sec. Water Use:		**Latitude DD:**	45.446757
Total Depth m:	14.6	**Longitude DD:**	-75.498325
Depth Ref:	Ground Surface	**UTM Zone:**	18
Depth Elev:		**Easting:**	461031
Drill Method:		**Northing:**	5032702
Orig Ground Elev m:	89.9	**Location Accuracy:**	
Elev Reliabil Note:		**Accuracy:**	Not Applicable
DEM Ground Elev m:	89		
Concession:			
Location D:			
Survey D:			
Comments:			

Borehole Geology Stratum

Geology Stratum ID:	218403576	**Mat Consistency:**	
Top Depth:	0	**Material Moisture:**	
Bottom Depth:	12.2	**Material Texture:**	
Material Color:	Blue	**Non Geo Mat Type:**	
Material 1:	Clay	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	CLAY. BLUE.		

Geology Stratum ID:	218403577	**Mat Consistency:**	
Top Depth:	12.2	**Material Moisture:**	
Bottom Depth:	14.6	**Material Texture:**	
Material Color:	Grey	**Non Geo Mat Type:**	
Material 1:	Gravel	**Geologic Formation:**	
Material 2:		**Geologic Group:**	
Material 3:		**Geologic Period:**	
Material 4:		**Depositional Gen:**	
Gsc Material Description:			
Stratum Description:	GRAVEL. GREY. 00048 UNSPECIFIED. SEISMIC VELOCITY = 6300. BEDROCK. SEISMIC VELOCITY = 19500 **Note: Many records provided by the department have a truncated [Stratum Description] field.		

Source

Source Type:	Data Survey	**Source Appl:**	Spatial/Tabular
Source Orig:	Geological Survey of Canada	**Source Iden:**	1
Source Date:	1956-1972	**Scale or Res:**	Varies
Confidence:		**Horizontal:**	NAD27
Observatio:		**Verticalda:**	Mean Average Sea Level
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Details:	File: OTTAWA2.txt RecordID: 08798 NTS_Sheet:		
Confiden 1:			

Source List

Map Key	Number of Records	Direction/ Distance (m)	Elev/Diff (m)	Site	DB

Source Identifier:	1	**Horizontal Datum:**	NAD27
Source Type:	Data Survey	**Vertical Datum:**	Mean Average Sea Level
Source Date:	1956-1972	**Projection Name:**	Universal Transverse Mercator
Scale or Resolution:	Varies		
Source Name:	Urban Geology Automated Information System (UGAIS)		
Source Originators:	Geological Survey of Canada		

12	1 of 1	NW/164.2	88.6 / -0.94	2225 MER BLEUE Orl?ans ON	WWIS

Well ID:	7291135	**Flowing (Y/N):**	
Construction Date:		**Flow Rate:**	
Use 1st:	Test Hole	**Data Entry Status:**	
Use 2nd:	Monitoring	**Data Src:**	
Final Well Status:	Monitoring and Test Hole	**Date Received:**	28-Jul-2017 00:00:00
Water Type:		**Selected Flag:**	TRUE
Casing Material:		**Abandonment Rec:**	
Audit No:	Z215089	**Contractor:**	7241
Tag:	A190013	**Form Version:**	7
Constructn Method:		**Owner:**	
Elevation (m):		**County:**	OTTAWA-CARLETON
Elevatn Reliabilty:		**Lot:**	
Depth to Bedrock:		**Concession:**	
Well Depth:		**Concession Name:**	
Overburden/Bedrock:		**Easting NAD83:**	
Pump Rate:		**Northing NAD83:**	
Static Water Level:		**Zone:**	
Clear/Cloudy:		**UTM Reliability:**	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

PDF URL (Map): https://d2khazk8e83rdv.cloudfront.net/moe_mapping/downloads/2Water/Wells_pdfs/729\7291135.pdf

Additional Detail(s) (Map)

Well Completed Date:	2017/06/07
Year Completed:	2017
Depth (m):	4.57
Latitude:	45.4466459572626
Longitude:	-75.4987049885181
Path:	729\7291135.pdf

Bore Hole Information

Bore Hole ID:	1006673061	**Elevation:**	
DP2BR:		**Elevrc:**	
Spatial Status:		**Zone:**	18
Code OB:		**East83:**	461001.00
Code OB Desc:		**North83:**	5032690.00
Open Hole:		**Org CS:**	UTM83
Cluster Kind:		**UTMRC:**	4
Date Completed:	07-Jun-2017 00:00:00	**UTMRC Desc:**	margin of error : 30 m - 100 m
Remarks:		**Location Method:**	wwr
Loc Method Desc:	on Water Well Record		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock

Materials Interval

Formation ID:	1006817733
Layer:	2
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	06
Mat2 Desc:	SILT
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	1.0
Formation End Depth:	2.0
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1006817732
Layer:	1
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	02
Mat2 Desc:	TOPSOIL
Mat3:	66
Mat3 Desc:	DENSE
Formation Top Depth:	0.0
Formation End Depth:	1.0
Formation End Depth UOM:	m

Overburden and Bedrock Materials Interval

Formation ID:	1006817734
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	06
Mat2 Desc:	SILT
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	2.0
Formation End Depth:	4.570000171661377
Formation End Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID:	1006817742
Layer:	1
Plug From:	0.0
Plug To:	1.159999966621399
Plug Depth UOM:	m

Annular Space/Abandonment Sealing Record

Plug ID: 1006817743
Layer: 2
Plug From: 1.159999966621399
Plug To: 4.570000171661377
Plug Depth UOM: m

Method of Construction & Well Use

Method Construction ID: 1006817741
Method Construction Code: D
Method Construction: Direct Push
Other Method Construction:

Pipe Information

Pipe ID: 1006817731
Casing No: 0
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 1006817737
Layer: 1
Material: 5
Open Hole or Material: PLASTIC
Depth From: 0.0
Depth To: 1.4700000286102295
Casing Diameter: 4.03000020980835
Casing Diameter UOM: cm
Casing Depth UOM: m

Construction Record - Screen

Screen ID: 1006817738
Layer: 1
Slot: 10
Screen Top Depth: 1.4700000286102295
Screen End Depth: 4.570000171661377
Screen Material: 5
Screen Depth UOM: m
Screen Diameter UOM: cm
Screen Diameter: 4.820000171661377

Water Details

Water ID: 1006817736
Layer:
Kind Code:
Kind:
Water Found Depth:
Water Found Depth UOM: m

Hole Diameter

Hole ID: 1006817735
Diameter: 8.300000190734863
Depth From: 0.0
Depth To: 4.570000171661377
Hole Depth UOM: m

Hole Diameter UOM: cm

Links

Bore Hole ID:	1006673061	**Tag No:**	A190013
Depth M:	4.57	**Contractor:**	7241
Year Completed:	2017	**Path:**	729\7291135.pdf
Well Completed Dt:	2017/06/07	**Latitude:**	45.4466459572626
Audit No:	Z215089	**Longitude:**	-75.4987049885181

---

13 | **1 of 1** | **N/190.5** | **88.9 / -0.64** | **2225 Mer Bleue Rd Ottawa ON K4A3T9** | **EHS**

Order No:	20170517044	**Nearest Intersection:**	
Status:	C	**Municipality:**	
Report Type:	Custom Report	**Client Prov/State:**	ON
Report Date:	02-JUN-17	**Search Radius (km):**	.25
Date Received:	17-MAY-17	**X:**	-75.49679
Previous Site Name:		**Y:**	45.447446
Lot/Building Size:			
Additional Info Ordered:			

---

14 | **1 of 2** | **N/218.7** | **89.5 / -0.01** | **Hopital Montfort Hospital 2225 chemin Mer Bleue Orleans ON K4A 3T8** | **GEN**

Generator No:	ON3529500
SIC Code:	
SIC Description:	
Approval Years:	As of Nov 2021
PO Box No:	
Country:	Canada
Status:	Registered
Co Admin:	
Choice of Contact:	
Phone No Admin:	
Contaminated Facility:	
MHSW Facility:	

Detail(s)

Waste Class:	261 A
Waste Class Name:	Pharmaceuticals
Waste Class:	312 P
Waste Class Name:	Pathological wastes

---

14 | **2 of 2** | **N/218.7** | **89.5 / -0.01** | **EllisDon Corporation 2225 Mer-Bleue Rd Ottawa ON K4A 3T9** | **GEN**

Generator No:	ON7961801
SIC Code:	
SIC Description:	
Approval Years:	As of Nov 2021
PO Box No:	
Country:	Canada
Status:	Registered
Co Admin:	
Choice of Contact:	
Phone No Admin:	

Contaminated Facility:
MHSW Facility:

Detail(s)

Waste Class:	252 L
Waste Class Name:	Waste crankcase oils and lubricants

Unplottable Summary

Total: 102 Unplottable sites

DB	Company Name/Site Name	Address	City	Postal
CA	City of Ottawa	Mer Bleue Rd (Innes Rd 700m south)	Ottawa ON	
CA	City of Ottawa	Mer Bleue Rd (Innes Rd 700m south)	Ottawa ON	
ECA	Tamarack (Mer Bleu) Corporation	Brian Coburn Boulevard	Ottawa ON	K1V 8Y3
ECA	The Corporation of the City of Ottawa	Brian Coburn Boulevard	Ottawa ON	K2G 7E6
ECA	City of Ottawa	Tenth Line South of Brian Coburn Blvd to South of Harvest Valley Ave.	Ottawa ON	K1P 1J1
ECA	Caivan Greenbank Development Corporation		Ottawa ON	K2H 1B2
ECA	City of Ottawa	Brian Coburn Blvd Navan Road	Ottawa ON	K2G 6J8
ECA	Caivan Greenbank Development Corporation		Ottawa ON	K2H 1B2
ECA	Caivan Greenbank Development Corporation		Ottawa ON	K2H 1B2
ECA	City of Ottawa	Brian Coburn Boulevard	Ottawa ON	K2G 6J8
PINC	PIPELINE HIT 2"	SOUTHWEST CORNER OF ISLAND PARK DR,, OTTAWA,ON,K1Y,CA	ON	
PINC	PIPELINE HIT - 2"	DOCTEUR CORBEIL BLVD,,OTTAWA,ON,,CA	ON	
PINC	Pipeline Hit	Trentham Road,,Ottawa,ON,,CA	ON	
PINC	PIPELINE HIT - 1/2"	DES SOLDATES ST,,OTTAWA,ON,,CA	ON	
PINC	PIPELINE HIT 4"	CHAPMAN MILLS DR,NEAR STRANDHERD DR, OTTAWA,ON,K2J 0B7,CA	ON	
PTTW	Taggart Construction Limited	Tenth Line Road at Mer Bleue Road, Chaperal Subdivision Cumberland, Lot SE 1/2 of Lot 2, Concession 11, Cumberland, Ottawa City CITY OF OTTAWA	ON	

RSC	CAIVAN GREENBANK DEVELOPMENT CORPORATION	No Municipal Address	Ottawa ON
WWIS		lot 2	ON
WWIS		lot 2	ON
WWIS		lot 1	ON
WWIS		lot 2	ON
WWIS		lot 1	ON
WWIS		lot 3	ON
WWIS		lot 1	ON
WWIS		lot 2	ON
WWIS		lot 1	ON
WWIS		lot 2	ON
WWIS		lot 1	ON
WWIS		lot 3	ON
WWIS		lot 3	ON
WWIS		lot 3	ON
WWIS		lot 3	ON
WWIS		lot 1	ON
WWIS		lot 3	ON
WWIS		lot 2	ON
WWIS		lot 1	ON
WWIS		lot 1	ON
WWIS		lot 1	ON
WWIS		lot 3	ON

WWIS	lot 3	ON
WWIS	lot 1	ON
WWIS	lot 3	ON
WWIS	lot 3	ON
WWIS	lot 2	ON
WWIS	lot 3	ON
WWIS	lot 3	ON
WWIS	lot 2	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 3	ON
WWIS	lot 1	ON
WWIS	lot 3	ON
WWIS	lot 3	ON
WWIS	lot 3	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 3	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 1	ON

WWIS	lot 3	ON
WWIS	lot 3	ON
WWIS	lot 3	ON
WWIS	lot 1	ON
WWIS	lot 3	ON
WWIS	lot 2	ON
WWIS	lot 2	ON
WWIS	lot 3	ON
WWIS	lot 3	ON
WWIS	lot 2	ON
WWIS	lot 3	ON
WWIS	lot 2	ON
WWIS	lot 1	ON
WWIS	lot 3	ON
WWIS	lot 1	ON
WWIS	lot 2	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 2	ON
WWIS	lot 1	ON
WWIS	lot 2	ON
WWIS	lot 3	ON

WWIS	lot 2	ON
WWIS	lot 2	ON
WWIS	lot 1	ON
WWIS	lot 1	ON
WWIS	lot 2	ON
WWIS	lot 3	ON
WWIS	lot 3	ON
WWIS	lot 1	ON
WWIS	lot 2	ON
WWIS	lot 3	ON
WWIS	lot 2	ON
WWIS	lot 2	ON
WWIS	lot 2	ON
WWIS	lot 2	ON
WWIS	lot 1	ON
WWIS	lot 3	ON

Unplottable Report

Site: ***City of Ottawa***
Mer Bleue Rd (Innes Rd 700m south) Ottawa ON

Database: ***CA***

Certificate #:	2501-6V7Q25
Application Year:	2006
Issue Date:	11/10/2006
Approval Type:	Municipal and Private Sewage Works
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***City of Ottawa***
Mer Bleue Rd (Innes Rd 700m south) Ottawa ON

Database: ***CA***

Certificate #:	8790-6VKTPK
Application Year:	2007
Issue Date:	4/26/2007
Approval Type:	Municipal and Private Sewage Works
Status:	Approved
Application Type:	
Client Name:	
Client Address:	
Client City:	
Client Postal Code:	
Project Description:	
Contaminants:	
Emission Control:	

Site: ***Tamarack (Mer Bleu) Corporation***
Brian Coburn Boulevard Ottawa ON K1V 8Y3

Database: ***ECA***

Approval No:	3522-8S8JMQ	***MOE District:***	
Approval Date:	2012-03-12	***City:***	
Status:	Approved	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	
Approval Type:	ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS		
Project Type:	MUNICIPAL AND PRIVATE SEWAGE WORKS		
Business Name:	Tamarack (Mer Bleu) Corporation		
Address:	Brian Coburn Boulevard		
Full Address:			
Full PDF Link:	https://www.accessenvironment.ene.gov.on.ca/instruments/8059-8S6RZ6-14.pdf		
PDF Site Location:			

Site: ***The Corporation of the City of Ottawa***
Brian Coburn Boulevard Ottawa ON K2G 7E6

Database: ***ECA***

Approval No:	1230-A4LPM6	***MOE District:***	

Approval Date: 2015-12-02
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: The Corporation of the City of Ottawa
Address: Brian Coburn Boulevard
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/2099-A48M46-14.pdf
PDF Site Location:

Site: ***City of Ottawa***
Tenth Line South of Brian Coburn Blvd to South of Harvest Valley Ave. Ottawa ON K1P 1J1

Database: ***ECA***

Approval No: 5512-ABUQ37
Approval Date: 2016-07-22
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: City of Ottawa
Address: Tenth Line South of Brian Coburn Blvd to South of Harvest Valley Ave.
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/0335-ABNPBD-14.pdf
PDF Site Location:

Site: ***Caivan Greenbank Development Corporation***
Ottawa ON K2H 1B2

Database: ***ECA***

Approval No: 7058-CETMJA
Approval Date: August 16, 2022
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District: North Bay
City:
Longitude:
Latitude:
Geometry X: -9016878.7543000001
Geometry Y: 5700582.7322999965
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: Caivan Greenbank Development Corporation
Address:
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/5049-CELRT8-14.pdf
PDF Site Location: The Ridge Subdivision
Park Lot 9 (Rideau Front)
City of Ottawa, Ontario

Site: ***City of Ottawa***
Brian Coburn Blvd Navan Road Ottawa ON K2G 6J8

Database: ***ECA***

Approval No: 3536-AZPKY6
Approval Date: 2018-06-29
Status: Approved
Record Type: ECA
Link Source: IDS
SWP Area Name:
MOE District:
City:
Longitude:
Latitude:
Geometry X:
Geometry Y:
Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: City of Ottawa
Address: Brian Coburn Blvd Navan Road
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/9726-AZERBS-14.pdf

PDF Site Location:

Site: ***Caivan Greenbank Development Corporation***
Ottawa ON K2H 1B2

Database: ***ECA***

Approval No:	1799-BTHJMX	***MOE District:***	
Approval Date:	2020-09-18	***City:***	
Status:	Approved	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	

Approval Type: ECA-INDUSTRIAL SEWAGE WORKS
Project Type: INDUSTRIAL SEWAGE WORKS
Business Name: Caivan Greenbank Development Corporation
Address:
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/1192-BTGHQH-14.pdf
PDF Site Location:

Site: ***Caivan Greenbank Development Corporation***
Ottawa ON K2H 1B2

Database: ***ECA***

Approval No:	9590-BTHKN4	***MOE District:***	
Approval Date:	2020-09-18	***City:***	
Status:	Approved	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	

Approval Type: ECA-INDUSTRIAL SEWAGE WORKS
Project Type: INDUSTRIAL SEWAGE WORKS
Business Name: Caivan Greenbank Development Corporation
Address:
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/3008-BTGJMD-14.pdf
PDF Site Location:

Site: ***City of Ottawa***
Brian Coburn Boulevard Ottawa ON K2G 6J8

Database: ***ECA***

Approval No:	7002-A9SLGL	***MOE District:***	
Approval Date:	2016-05-13	***City:***	
Status:	Revoked and/or Replaced	***Longitude:***	
Record Type:	ECA	***Latitude:***	
Link Source:	IDS	***Geometry X:***	
SWP Area Name:		***Geometry Y:***	

Approval Type: ECA-MUNICIPAL AND PRIVATE SEWAGE WORKS
Project Type: MUNICIPAL AND PRIVATE SEWAGE WORKS
Business Name: City of Ottawa
Address: Brian Coburn Boulevard
Full Address:
Full PDF Link: https://www.accessenvironment.ene.gov.on.ca/instruments/8723-A4CT6C-14.pdf
PDF Site Location:

Site: ***PIPELINE HIT 2"***
SOUTHWEST CORNER OF ISLAND PARK DR,,OTTAWA,ON,K1Y,CA ON

Database: ***PINC***

Incident Id:		***Pipe Material:***	
Incident No:	2382058	***Fuel Category:***	
Incident Reported Dt:	8/27/2018	***Health Impact:***	
Type:	FS-Pipeline Incident	***Environment Impact:***	
Status Code:		***Property Damage:***	
Tank Status:	Pipeline Damage Reason Est	***Service Interrupt:***	

Task No:		***Enforce Policy:***	
Spills Action Centre:		***Public Relation:***	
Fuel Type:		***Pipeline System:***	
Fuel Occurrence Tp:		***PSIG:***	
Date of Occurrence:		***Attribute Category:***	
Occurrence Start Dt:		***Regulator Location:***	
Depth:		***Method Details:***	
Customer Acct Name:	PIPELINE HIT 2"		
Incident Address:	SOUTHWEST CORNER OF ISLAND PARK DR,,OTTAWA,ON,K1Y,CA		
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:			
Reported By:			
Affiliation:			
Occurrence Desc:			
Damage Reason:			
Notes:			

Site: ***PIPELINE HIT - 2"***
DOCTEUR CORBEIL BLVD,,OTTAWA,ON,,CA ON

Database: ***PINC***

Incident Id:		***Pipe Material:***	
Incident No:	984924	***Fuel Category:***	
Incident Reported Dt:	12/20/2012	***Health Impact:***	
Type:	FS-Pipeline Incident	***Environment Impact:***	
Status Code:		***Property Damage:***	
Tank Status:	Pipeline Damage Reason Est	***Service Interrupt:***	
Task No:		***Enforce Policy:***	
Spills Action Centre:		***Public Relation:***	
Fuel Type:		***Pipeline System:***	
Fuel Occurrence Tp:		***PSIG:***	
Date of Occurrence:		***Attribute Category:***	
Occurrence Start Dt:		***Regulator Location:***	
Depth:		***Method Details:***	
Customer Acct Name:	PIPELINE HIT - 2"		
Incident Address:	DOCTEUR CORBEIL BLVD,,OTTAWA,ON,,CA		
Operation Type:			
Pipeline Type:			
Regulator Type:			
Summary:			
Reported By:			
Affiliation:			
Occurrence Desc:			
Damage Reason:			
Notes:			

Site: ***Pipeline Hit***
Trentham Road,,Ottawa,ON,,CA ON

Database: ***PINC***

Incident Id:		***Pipe Material:***	
Incident No:	941086	***Fuel Category:***	
Incident Reported Dt:	11/13/2012	***Health Impact:***	
Type:	FS-Pipeline Incident	***Environment Impact:***	
Status Code:		***Property Damage:***	
Tank Status:	Pipeline Damage Reason Est	***Service Interrupt:***	
Task No:		***Enforce Policy:***	
Spills Action Centre:		***Public Relation:***	
Fuel Type:		***Pipeline System:***	
Fuel Occurrence Tp:		***PSIG:***	
Date of Occurrence:		***Attribute Category:***	
Occurrence Start Dt:		***Regulator Location:***	
Depth:		***Method Details:***	
Customer Acct Name:	Pipeline Hit		
Incident Address:	Trentham Road,,Ottawa,ON,,CA		
Operation Type:			

Pipeline Type:
Regulator Type:
Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Notes:

Site: ***PIPELINE HIT - 1/2"***
DES SOLDATES ST,,OTTAWA,ON,,CA ON

Database: ***PINC***

Incident Id:
Incident No: 1923654
Incident Reported Dt: 8/16/2016
Type: FS-Pipeline Incident
Status Code:
Tank Status: Non Mandated
Task No:
Spills Action Centre:
Fuel Type:
Fuel Occurrence Tp:
Date of Occurrence:
Occurrence Start Dt:
Depth:
Pipe Material:
Fuel Category:
Health Impact:
Environment Impact:
Property Damage:
Service Interrupt:
Enforce Policy:
Public Relation:
Pipeline System:
PSIG:
Attribute Category:
Regulator Location:
Method Details:
Customer Acct Name: PIPELINE HIT - 1/2"
Incident Address: DES SOLDATES ST,,OTTAWA,ON,,CA
Operation Type:
Pipeline Type:
Regulator Type:
Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Notes:

Site: ***PIPELINE HIT 4"***
CHAPMAN MILLS DR,NEAR STRANDHERD DR,OTTAWA,ON,K2J 0B7,CA ON

Database: ***PINC***

Incident Id:
Incident No: 2300378
Incident Reported Dt: 5/8/2018
Type: FS-Pipeline Incident
Status Code:
Tank Status: Pipeline Damage Reason Est
Task No:
Spills Action Centre:
Fuel Type:
Fuel Occurrence Tp:
Date of Occurrence:
Occurrence Start Dt:
Depth:
Pipe Material:
Fuel Category:
Health Impact:
Environment Impact:
Property Damage:
Service Interrupt:
Enforce Policy:
Public Relation:
Pipeline System:
PSIG:
Attribute Category:
Regulator Location:
Method Details:
Customer Acct Name: PIPELINE HIT 4"
Incident Address: CHAPMAN MILLS DR,NEAR STRANDHERD DR,OTTAWA,ON,K2J 0B7,CA
Operation Type:
Pipeline Type:
Regulator Type:
Summary:
Reported By:
Affiliation:
Occurrence Desc:
Damage Reason:
Notes:

Site: ***Taggart Construction Limited*** ***Database:*** ***PTTW***
Tenth Line Road at Mer Bleue Road, Chaperal Subdivision Cumberland, Lot SE 1/2 of Lot 2, Concession 11, Cumberland, Ottawa City CITY OF OTTAWA ON

EBR Registry No:	010-5074	***Decision Posted:***	
Ministry Ref No:	2420-7KWNSZ	***Exception Posted:***	
Notice Type:	Instrument Decision	***Section:***	
Notice Stage:		***Act 1:***	
Notice Date:	April 14, 2009	***Act 2:***	
Proposal Date:	November 07, 2008	***Site Location Map:***	
Year:	2008		
Instrument Type:	(OWRA s. 34) - Permit to Take Water		
Off Instrument Name:			
Posted By:			
Company Name:	Taggart Construction Limited		
Site Address:			
Location Other:			
Proponent Name:			
Proponent Address:	3187 Albion Rd S, Ottawa Ontario, K1V 8Y3		
Comment Period:			
URL:			

Site Location Details:

Tenth Line Road at Mer Bleue Road, Chaperal Subdivision Cumberland, Lot SE 1/2 of Lot 2, Concession 11, Cumberland, Ottawa City CITY OF OTTAWA

Site: ***CAIVAN GREENBANK DEVELOPMENT CORPORATION*** ***Database:*** ***RSC***
No Municipal Address Ottawa ON

RSC ID:	227501	***Cert Date:***	
RA No:		***Cert Prop Use No:***	
RSC Type:	Phase 1 and 2 RSC	***Intended Prop Use:***	Residential
Curr Property Use:	Industrial	***Qual Person Name:***	KARYN MUNCH
Ministry District:	Ottawa District Office	***Stratified (Y/N):***	
Filing Date:	2021/01/18	***Audit (Y/N):***	
Date Ack:		***Entire Leg Prop. (Y/N):***	
Date Returned:		***Accuracy Estimate:***	
Restoration Type:		***Telephone:***	
Soil Type:		***Fax:***	
Criteria:		***Email:***	
CPU Issued Sect 1686:			
Asmt Roll No:	0614120770097010000		
Prop ID No (PIN):	04592-2993 (LT)		
Property Municipal Address:	No Municipal Address		
Mailing Address:			
Latitude & Latitude:			
UTM Coordinates:			
Consultant:			
Legal Desc:			
Measurement Method:			
Applicable Standards:			
RSC PDF:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=138611&fileName=BROWNFIELDS-E.pdf		

Document(s) Detail

Document Heading:	Supporting Documents
Document Name:	RSC Letter.pdf
Document Type:	Lawyer's letter consisting of a legal description of the property
Document Link:	https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=138607&fileName=RSC+Letter.pdf
Document Heading:	Supporting Documents

Document Name: RSC Survey Highlighted.pdf
Document Type: A Current plan of Survey
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=138608&fileName=RSC+Survey+Highlighted.pdf

Document Heading: Supporting Documents
Document Name: Certificate of Status.pdf
Document Type: Certificate of Status
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=138606&fileName=Certificate+of+Status.pdf

Document Heading: Supporting Documents
Document Name: Transfer.pdf
Document Type: Copy of any deed(s), transfer(s) or other document(s)
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=141084&fileName=Transfer.pdf

Document Heading: Supporting Documents
Document Name: Phase II CSM_reduced.pdf
Document Type: Phase 2 Conceptual Site Model
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=138609&fileName=Phase+II+CSM_reduced.pdf

Document Heading: Supporting Documents
Document Name: APEC Table.pdf
Document Type: Area(s) of Potential Environmental Concern
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=138614&fileName=APEC+Table.pdf

Document Heading: Supporting Documents
Document Name: Current and Past Uses.pdf
Document Type: Table of Current and Past Property Use
Document Link: https://www.lrcsde.lrc.gov.on.ca/BFISWebPublic/pub/viewDocument.action?attachmentId=138612&fileName=Current+and+Past+Uses.pdf

---

Site:
lot 2 ON

Database: ***WWIS***

Well ID:	1533938	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Commerical	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	09-Jul-2003 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	263122	***Contractor:***	6006
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	002
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10543053	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9

Date Completed: 24-Jun-2003 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 932924632
Layer: 1
Color: 5
General Color: YELLOW
Mat1: 28
Most Common Material: SAND
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 7.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932924633
Layer: 2
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 7.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932924636
Layer: 5
Color: 2
General Color: GREY
Mat1: 18
Most Common Material: SANDSTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 71.0
Formation End Depth: 100.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932924635

Layer: 4
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 28
Mat2 Desc: SAND
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 60.0
Formation End Depth: 71.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932924634
Layer: 3
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 28
Mat2 Desc: SAND
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 12.0
Formation End Depth: 60.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933240829
Layer: 1
Plug From: 0.0
Plug To: 20.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961533938
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 11091623
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930097909
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID:	930097908
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991533938
Pump Set At:	
Static Level:	15.0
Final Level After Pumping:	80.0
Recommended Pump Depth:	90.0
Pumping Rate:	30.0
Flowing Rate:	
Recommended Pump Rate:	20.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934113065
Test Type:	Draw Down
Test Duration:	15
Test Level:	80.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934914086
Test Type:	Draw Down
Test Duration:	60
Test Level:	80.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934656639
Test Type:	Draw Down
Test Duration:	45
Test Level:	80.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934396679
Test Type:	Draw Down
Test Duration:	30
Test Level:	80.0
Test Level UOM:	ft

Water Details

Water ID:	934036777
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	73.0
Water Found Depth UOM:	ft

Site:
lot 2 ON

Database:
WWIS

Well ID:	5602894	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	08-Jun-1984 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:		***Contractor:***	1517
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	002
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10375463	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	01-May-1984 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932245137
Layer:	4
Color:	8
General Color:	BLACK
Mat1:	26
Most Common Material:	ROCK
Mat2:	15
Mat2 Desc:	LIMESTONE
Mat3:	
Mat3 Desc:	

Formation Top Depth: 78.0
Formation End Depth: 95.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932245135
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 15.0
Formation End Depth: 38.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932245134
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 15.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932245136
Layer: 3
Color: 6
General Color: BROWN
Mat1: 11
Most Common Material: GRAVEL
Mat2: 28
Mat2 Desc: SAND
Mat3:
Mat3 Desc:
Formation Top Depth: 38.0
Formation End Depth: 78.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933185421
Layer: 1
Plug From: 0.0
Plug To: 24.0
Plug Depth UOM: ft

Method of Construction & Well

Use

Method Construction ID: 965602894
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10924033
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930621207
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 78.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 995602894
Pump Set At:
Static Level: 27.0
Final Level After Pumping: 80.0
Recommended Pump Depth:
Pumping Rate: 3.0
Flowing Rate:
Recommended Pump Rate:
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934817022
Test Type:
Test Duration: 45
Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934566260
Test Type:
Test Duration: 30
Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934289923
Test Type:
Test Duration: 15
Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935082765
Test Type:
Test Duration: 60
Test Level: 80.0
Test Level UOM: ft

Water Details

Water ID: 933856837
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 92.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 5602893
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 08-Jun-1984 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10375462
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 01-May-1984 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 932245131
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 18.0
Formation End Depth: 28.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932245133
Layer: 4
Color: 8
General Color: BLACK
Mat1: 26
Most Common Material: ROCK
Mat2: 15
Mat2 Desc: LIMESTONE
Mat3:
Mat3 Desc:
Formation Top Depth: 81.0
Formation End Depth: 90.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932245132
Layer: 3
Color: 6
General Color: BROWN
Mat1: 11
Most Common Material: GRAVEL
Mat2: 28
Mat2 Desc: SAND
Mat3:
Mat3 Desc:
Formation Top Depth: 28.0
Formation End Depth: 81.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932245130
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0

Formation End Depth: 18.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933185420
Layer: 1
Plug From: 0.0
Plug To: 23.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 965602893
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10924032
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930621206
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 81.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 995602893
Pump Set At:
Static Level: 25.0
Final Level After Pumping: 65.0
Recommended Pump Depth:
Pumping Rate: 8.0
Flowing Rate:
Recommended Pump Rate:
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 15
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934566259
Test Type:
Test Duration: 30

Test Level: 65.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934817021
Test Type:
Test Duration: 45
Test Level: 65.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 935082764
Test Type:
Test Duration: 60
Test Level: 65.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934289922
Test Type:
Test Duration: 15
Test Level: 65.0
Test Level UOM: ft

Water Details

Water ID: 933856836
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 88.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database: ***WWIS***

Well ID: 1534279
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 263167
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 07-Nov-2003 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 6006
Form Version: 2
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name: COM E
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 11097331
DP2BR:
Elevation:
Elevrc:

Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 02-Sep-2003 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 932942001
Layer: 1
Color: 5
General Color: YELLOW
Mat1: 28
Most Common Material: SAND
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932942003
Layer: 3
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 130.0
Formation End Depth: 141.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932942002
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 12.0
Formation End Depth: 130.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID:	932942004
Layer:	4
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Mat2 Desc:	HARD
Mat3:	
Mat3 Desc:	
Formation Top Depth:	141.0
Formation End Depth:	155.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933245119
Layer:	1
Plug From:	0.0
Plug To:	20.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961534279
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	11101046
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930832058
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	141.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930832059
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	155.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991534279
Pump Set At:	
Static Level:	35.0
Final Level After Pumping:	100.0
Recommended Pump Depth:	140.0
Pumping Rate:	25.0
Flowing Rate:	
Recommended Pump Rate:	10.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	30
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934114173
Test Type:	Draw Down
Test Duration:	15
Test Level:	100.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934397787
Test Type:	Draw Down
Test Duration:	30
Test Level:	100.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934657747
Test Type:	Draw Down
Test Duration:	45
Test Level:	100.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934915194
Test Type:	Draw Down
Test Duration:	60
Test Level:	100.0
Test Level UOM:	ft

Water Details

Water ID:	934042515
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	141.0
Water Found Depth UOM:	ft

Site: ***Database:*** ***WWIS***

lot 1 ON

Well ID:	1532982	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	06-Aug-2002 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	237355	***Contractor:***	6006
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10529729	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	13-Jul-2002 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	932879809
Layer:	3
Color:	2
General Color:	GREY
Mat1:	18
Most Common Material:	SANDSTONE
Mat2:	73
Mat2 Desc:	HARD
Mat3:	
Mat3 Desc:	
Formation Top Depth:	150.0
Formation End Depth:	265.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	932879810
Layer:	4
Color:	6
General Color:	BROWN

Mat1: 15
Most Common Material: LIMESTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 265.0
Formation End Depth: 275.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932879807
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 13
Mat2 Desc: BOULDERS
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 0.0
Formation End Depth: 3.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 932879808
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 3.0
Formation End Depth: 150.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933230065
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961532982
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 11078299
Casing No: 1

Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930095974
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930095973
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930095975
Layer: 3
Material:
Open Hole or Material:
Depth From:
Depth To:
Casing Diameter: 5.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991532982
Pump Set At:
Static Level: 18.0
Final Level After Pumping: 275.0
Recommended Pump Depth: 265.0
Pumping Rate: 5.0
Flowing Rate:
Recommended Pump Rate: 4.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934118539
Test Type: Recovery
Test Duration: 15
Test Level: 200.0

Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934662673
Test Type: Recovery
Test Duration: 45
Test Level: 100.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934911770
Test Type: Recovery
Test Duration: 60
Test Level: 11.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934402153
Test Type: Recovery
Test Duration: 30
Test Level: 150.0
Test Level UOM: ft

Water Details

Water ID: 934022300
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 265.0
Water Found Depth UOM: ft

Water Details

Water ID: 934022299
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 49.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1531723
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 220258
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 26-Jan-2001 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:

Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10053257
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 28-Oct-2000 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931079338
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 37.0
Formation End Depth: 42.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931079337
Layer: 2
Color: 2
General Color: GREY
Mat1: 14
Most Common Material: HARDPAN
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 3.0
Formation End Depth: 37.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931079339
Layer: 4
Color: 2
General Color: GREY
Mat1: 15

Most Common Material: LIMESTONE
Mat2: 14
Mat2 Desc: HARDPAN
Mat3:
Mat3 Desc:
Formation Top Depth: 42.0
Formation End Depth: 73.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931079336
Layer: 1
Color: 6
General Color: BROWN
Mat1: 02
Most Common Material: TOPSOIL
Mat2: 81
Mat2 Desc: SANDY
Mat3: 05
Mat3 Desc: CLAY
Formation Top Depth: 0.0
Formation End Depth: 3.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116887
Layer: 1
Plug From: 0.0
Plug To: 42.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531723
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10601827
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930093304
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 18.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991531723
Pump Set At:
Static Level: 23.0
Final Level After Pumping: 30.0
Recommended Pump Depth: 50.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 12.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934114544
Test Type: Draw Down
Test Duration: 15
Test Level: 28.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934916125
Test Type: Draw Down
Test Duration: 60
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934658679
Test Type: Draw Down
Test Duration: 45
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934397743
Test Type: Draw Down
Test Duration: 30
Test Level: 28.0
Test Level UOM: ft

Water Details

Water ID: 933492311
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 72.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database: ***WWIS***

Well ID: 1531631
Construction Date:

Flowing (Y/N):
Flow Rate:

Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	04-Dec-2000 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	200302	***Contractor:***	3749
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10053165	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	03-Dec-1999 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931079084
Layer:	4
Color:	2
General Color:	GREY
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	06
Mat2 Desc:	SILT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	283.0
Formation End Depth:	292.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931079083
Layer:	3
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	79
Mat2 Desc:	PACKED

Mat3:
Mat3 Desc:
Formation Top Depth: 38.0
Formation End Depth: 283.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931079085
Layer: 5
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 77
Mat2 Desc: LOOSE
Mat3:
Mat3 Desc:
Formation Top Depth: 292.0
Formation End Depth: 298.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931079082
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 28
Mat2 Desc: SAND
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 5.0
Formation End Depth: 38.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931079081
Layer: 1
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 01
Mat2 Desc: FILL
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 0.0
Formation End Depth: 5.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116802
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531631
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10601735
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930093100
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 5.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930093098
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930093099
Layer: 2
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 5.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991531631
Pump Set At:
Static Level: 160.0
Final Level After Pumping: 296.0
Recommended Pump Depth: 200.0
Pumping Rate: 25.0
Flowing Rate:
Recommended Pump Rate: 15.0
Levels UOM: ft

Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934114042
Test Type: Recovery
Test Duration: 15
Test Level: 194.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934658176
Test Type: Recovery
Test Duration: 45
Test Level: 160.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934915067
Test Type: Recovery
Test Duration: 60
Test Level: 160.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934397658
Test Type: Recovery
Test Duration: 30
Test Level: 168.0
Test Level UOM: ft

Water Details

Water ID: 933492171
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 294.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1531630
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 200311
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 04-Dec-2000 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002

Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10053164
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 18-Aug-1999 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931079079
Layer: 1
Color: 6
General Color: BROWN
Mat1: 01
Most Common Material: FILL
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 3.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931079080
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 3.0
Formation End Depth: 330.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116801
Layer: 1
Plug From: 6.0
Plug To: 42.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531630
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10601734
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930093097
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991531630
Pump Set At:
Static Level: 62.0
Final Level After Pumping: 330.0
Recommended Pump Depth: 320.0
Pumping Rate: 7.0
Flowing Rate:
Recommended Pump Rate: 6.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934658175
Test Type: Recovery
Test Duration: 45
Test Level: 173.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934915066

Test Type: Recovery
Test Duration: 60
Test Level: 152.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934114041
Test Type: Recovery
Test Duration: 15
Test Level: 279.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934397657
Test Type: Recovery
Test Duration: 30
Test Level: 202.0
Test Level UOM: ft

Water Details

Water ID: 933492169
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 284.0
Water Found Depth UOM: ft

Water Details

Water ID: 933492168
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 210.0
Water Found Depth UOM: ft

Water Details

Water ID: 933492170
Layer: 3
Kind Code: 1
Kind: FRESH
Water Found Depth: 318.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1531628
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 200308
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 04-Dec-2000 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:

Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10053162
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 10-Nov-1999 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931079075
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 5.0
Formation End Depth: 405.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931079074
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 5.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116799

Layer: 1
Plug From: 8.0
Plug To: 46.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531628
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10601732
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930093095
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991531628
Pump Set At:
Static Level: 45.0
Final Level After Pumping: 405.0
Recommended Pump Depth: 390.0
Pumping Rate: 5.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934658173
Test Type: Recovery
Test Duration: 45
Test Level: 205.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934114039
Test Type: Recovery

Test Duration: 15
Test Level: 330.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934397655
Test Type: Recovery
Test Duration: 30
Test Level: 268.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934915064
Test Type: Recovery
Test Duration: 60
Test Level: 173.0
Test Level UOM: ft

Water Details

Water ID: 933492165
Layer: 3
Kind Code: 1
Kind: FRESH
Water Found Depth: 340.0
Water Found Depth UOM: ft

Water Details

Water ID: 933492164
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 262.0
Water Found Depth UOM: ft

Water Details

Water ID: 933492166
Layer: 4
Kind Code: 1
Kind: FRESH
Water Found Depth: 388.0
Water Found Depth UOM: ft

Water Details

Water ID: 933492163
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 194.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1531602
Construction Date:
Use 1st: Domestic
Use 2nd:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1

Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 221947
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Date Received: 12-Dec-2000 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10053136
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 01-Jun-2000 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931078977
Layer: 3
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 289.0
Formation End Depth: 296.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931078975
Layer: 1
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:

Formation Top Depth: 0.0
Formation End Depth: 110.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931078976
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 77
Mat2 Desc: LOOSE
Mat3:
Mat3 Desc:
Formation Top Depth: 110.0
Formation End Depth: 289.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116774
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531602
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10601706
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930093049
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991531602
Pump Set At:
Static Level: 64.0
Final Level After Pumping: 276.0

Recommended Pump Depth: 280.0
Pumping Rate: 10.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934397632
Test Type: Recovery
Test Duration: 30
Test Level: 174.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934658150
Test Type: Recovery
Test Duration: 45
Test Level: 128.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934915041
Test Type: Recovery
Test Duration: 60
Test Level: 97.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934114016
Test Type: Recovery
Test Duration: 15
Test Level: 205.0
Test Level UOM: ft

Water Details

Water ID: 933492130
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 296.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1531599
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 12-Dec-2000 00:00:00
Selected Flag: TRUE
Abandonment Rec:

Audit No:	199441	***Contractor:***	3749
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10053133	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	30-Jun-2000 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931078970
Layer:	1
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	430.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933116771
Layer:	1
Plug From:	0.0
Plug To:	44.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961531599
Method Construction Code:	4
Method Construction:	Rotary (Air)

Other Method Construction:

Pipe Information

Pipe ID: 10601703
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930093046
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991531599
Pump Set At:
Static Level: 29.0
Final Level After Pumping: 430.0
Recommended Pump Depth: 400.0
Pumping Rate: 3.0
Flowing Rate:
Recommended Pump Rate: 3.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934658147
Test Type: Recovery
Test Duration: 45
Test Level: 264.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934114013
Test Type: Recovery
Test Duration: 15
Test Level: 348.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934915038
Test Type: Recovery
Test Duration: 60
Test Level: 230.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID:	934397629
Test Type:	Recovery
Test Duration:	30
Test Level:	302.0
Test Level UOM:	ft

Water Details

Water ID:	933492122
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	240.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933492123
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	310.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933492124
Layer:	3
Kind Code:	1
Kind:	FRESH
Water Found Depth:	412.0
Water Found Depth UOM:	ft

Site:
lot 3 ON

Database:
WWIS

Well ID:	1531567	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	17-Nov-2000 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	224544	***Contractor:***	1414
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10053101	***Elevation:***	
DP2BR:		***Elevrc:***	

Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 09-Nov-2000 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931078871
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 28
Mat2 Desc: SAND
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 9.0
Formation End Depth: 278.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931078872
Layer: 3
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2: 71
Mat2 Desc: FRACTURED
Mat3:
Mat3 Desc:
Formation Top Depth: 278.0
Formation End Depth: 283.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931078870
Layer: 1
Color: 5
General Color: YELLOW
Mat1: 28
Most Common Material: SAND
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 9.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116738
Layer: 1
Plug From: 0.0
Plug To: 25.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531567
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10601671
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930092998
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930092997
Layer: 2
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930092996
Layer: 1
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 8.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP

Pump Test ID: 991531567
Pump Set At:
Static Level: 25.0
Final Level After Pumping: 200.0
Recommended Pump Depth: 100.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 8.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934658118
Test Type: Recovery
Test Duration: 45
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934397183
Test Type: Recovery
Test Duration: 30
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934915009
Test Type: Recovery
Test Duration: 60
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934113984
Test Type: Recovery
Test Duration: 15
Test Level: 25.0
Test Level UOM: ft

Water Details

Water ID: 933492076
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 280.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database: ***WWIS***

Well ID: 1531371
Construction Date:
Use 1st: Domestic
Flowing (Y/N):
Flow Rate:
Data Entry Status:

Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 220220
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Data Src: 1
Date Received: 07-Sep-2000 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10052905
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 12-Aug-2000 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931078296
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2: 05
Mat2 Desc: CLAY
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 18.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931078298
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:

Mat3 Desc:
Formation Top Depth: 30.0
Formation End Depth: 182.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931078297
Layer: 2
Color: 5
General Color: YELLOW
Mat1: 26
Most Common Material: ROCK
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 18.0
Formation End Depth: 30.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116537
Layer: 1
Plug From: 0.0
Plug To: 44.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531371
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10601475
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930092560
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991531371
Pump Set At:
Static Level: 15.0

Final Level After Pumping: 60.0
Recommended Pump Depth: 150.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934396039
Test Type: Draw Down
Test Duration: 30
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934657530
Test Type: Draw Down
Test Duration: 45
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934113535
Test Type: Draw Down
Test Duration: 15
Test Level: 45.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934914422
Test Type: Draw Down
Test Duration: 60
Test Level: 60.0
Test Level UOM: ft

Water Details

Water ID: 933491809
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 155.0
Water Found Depth UOM: ft

Water Details

Water ID: 933491810
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 179.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID:	1531270	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	08-Aug-2000 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	221325	***Contractor:***	6006
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10052804	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	24-Jul-2000 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931078038
Layer:	2
Color:	3
General Color:	BLUE
Mat1:	05
Most Common Material:	CLAY
Mat2:	85
Mat2 Desc:	SOFT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	8.0
Formation End Depth:	100.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931078039
Layer:	3
Color:	2

General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 100.0
Formation End Depth: 108.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931078037
Layer: 1
Color: 5
General Color: YELLOW
Mat1: 28
Most Common Material: SAND
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 8.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116442
Layer: 1
Plug From: 0.0
Plug To: 20.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531270
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10601374
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930092335
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc:	PUMP
Pump Test ID:	991531270
Pump Set At:	
Static Level:	25.0
Final Level After Pumping:	55.0
Recommended Pump Depth:	90.0
Pumping Rate:	30.0
Flowing Rate:	
Recommended Pump Rate:	10.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934657021
Test Type:	Recovery
Test Duration:	45
Test Level:	25.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934113443
Test Type:	Recovery
Test Duration:	15
Test Level:	30.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934395947
Test Type:	Recovery
Test Duration:	30
Test Level:	25.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934913913
Test Type:	Recovery
Test Duration:	60
Test Level:	25.0
Test Level UOM:	ft

Water Details

Water ID:	933491660
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	108.0
Water Found Depth UOM:	ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1531215
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 217004
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 21-Jul-2000 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1119
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name: LI
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10052749
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 31-May-2000 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931077852
Layer: 1
Color:
General Color:
Mat1: 28
Most Common Material: SAND
Mat2: 11
Mat2 Desc: GRAVEL
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 28.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931077853
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE

Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 28.0
Formation End Depth: 62.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116387
Layer: 1
Plug From: 2.0
Plug To: 33.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531215
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10601319
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930092223
Layer: 2
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930092222
Layer: 1
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 8.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930092224
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:

Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991531215
Pump Set At:
Static Level: 15.0
Final Level After Pumping: 50.0
Recommended Pump Depth: 50.0
Pumping Rate: 18.0
Flowing Rate:
Recommended Pump Rate: 18.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934121177
Test Type: Recovery
Test Duration: 15
Test Level: 15.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934396588
Test Type: Recovery
Test Duration: 30
Test Level: 15.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934665314
Test Type: Recovery
Test Duration: 45
Test Level: 15.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934913859
Test Type: Recovery
Test Duration: 60
Test Level: 15.0
Test Level UOM: ft

Water Details

Water ID: 933491579
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 48.0
Water Found Depth UOM: ft

Water Details

Water ID:	933491581
Layer:	3
Kind Code:	1
Kind:	FRESH
Water Found Depth:	55.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933491580
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	50.0
Water Found Depth UOM:	ft

Site:
lot 1 ON

Database:
WWIS

Well ID:	1531214	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	17-Jul-2000 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	208615	***Contractor:***	1558
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	BF
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	GLOUCESTER TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10052748	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	20-Jun-2000 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID: 931077850
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 21.0
Formation End Depth: 70.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931077851
Layer: 4
Color: 2
General Color: GREY
Mat1: 18
Most Common Material: SANDSTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 70.0
Formation End Depth: 110.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931077848
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 79
Mat2 Desc: PACKED
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 10.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931077849
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 10.0
Formation End Depth: 21.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116386
Layer: 1
Plug From: 26.0
Plug To: 0.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531214
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10601318
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930092220
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930092221
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991531214
Pump Set At:
Static Level: 15.0
Final Level After Pumping: 25.0
Recommended Pump Depth: 60.0
Pumping Rate: 30.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1

Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934121176
Test Type: Draw Down
Test Duration: 15
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934396587
Test Type: Draw Down
Test Duration: 30
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934665313
Test Type: Draw Down
Test Duration: 45
Test Level: 75.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934913858
Test Type: Draw Down
Test Duration: 60
Test Level: 105.0
Test Level UOM: ft

Water Details

Water ID: 933491577
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 66.0
Water Found Depth UOM: ft

Water Details

Water ID: 933491578
Layer: 2
Kind Code: 5
Kind: Not stated
Water Found Depth: 101.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1531001
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 21-Jan-2000 00:00:00
Selected Flag: TRUE
Abandonment Rec:

Audit No:	191618	***Contractor:***	1517
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10052535	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	06-Oct-1999 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931077212
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	14
Most Common Material:	HARDPAN
Mat2:	12
Mat2 Desc:	STONES
Mat3:	05
Mat3 Desc:	CLAY
Formation Top Depth:	0.0
Formation End Depth:	12.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931077214
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	26
Mat2 Desc:	ROCK
Mat3:	
Mat3 Desc:	
Formation Top Depth:	268.0
Formation End Depth:	280.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID: 931077213
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 12.0
Formation End Depth: 268.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933116178
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961531001
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10601105
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930091782
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 40.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991531001
Pump Set At:
Static Level: 22.0
Final Level After Pumping: 50.0
Recommended Pump Depth: 150.0
Pumping Rate: 20.0
Flowing Rate:

Recommended Pump Rate: 12.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934395434
Test Type: Draw Down
Test Duration: 30
Test Level: 45.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903895
Test Type: Draw Down
Test Duration: 60
Test Level: 50.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934120578
Test Type: Draw Down
Test Duration: 15
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934664716
Test Type: Draw Down
Test Duration: 45
Test Level: 50.0
Test Level UOM: ft

Water Details

Water ID: 933491323
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 270.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1530885
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 208491
Tag:
Constructn Method:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 07-Dec-1999 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1558
Form Version: 1
Owner:

Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name: LI
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10052419
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 28-Oct-1999 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931076862
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 12
Mat2 Desc: STONES
Mat3: 79
Mat3 Desc: PACKED
Formation Top Depth: 0.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931076864
Layer: 3
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 79
Mat2 Desc: PACKED
Mat3:
Mat3 Desc:
Formation Top Depth: 23.0
Formation End Depth: 27.0
Formation End Depth UOM: ft

Overburden and Bedrock

Materials Interval

Formation ID:	931076863
Layer:	2
Color:	2
General Color:	GREY
Mat1:	14
Most Common Material:	HARDPAN
Mat2:	79
Mat2 Desc:	PACKED
Mat3:	
Mat3 Desc:	
Formation Top Depth:	12.0
Formation End Depth:	23.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931076865
Layer:	4
Color:	2
General Color:	GREY
Mat1:	18
Most Common Material:	SANDSTONE
Mat2:	73
Mat2 Desc:	HARD
Mat3:	
Mat3 Desc:	
Formation Top Depth:	27.0
Formation End Depth:	60.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933116058
Layer:	1
Plug From:	0.0
Plug To:	28.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961530885
Method Construction Code:	5
Method Construction:	Air Percussion
Other Method Construction:	

Pipe Information

Pipe ID:	10600989
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930091535
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	60.0

Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930091534
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 29.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991530885
Pump Set At:
Static Level: 17.0
Final Level After Pumping: 20.0
Recommended Pump Depth: 40.0
Pumping Rate: 30.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934663638
Test Type:
Test Duration: 45
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934119500
Test Type:
Test Duration: 15
Test Level: 58.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903790
Test Type:
Test Duration: 60
Test Level: 20.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386238
Test Type:

Test Duration: 30
Test Level: 50.0
Test Level UOM: ft

Water Details

Water ID: 933491168
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 50.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1530820
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 206773
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 12-Oct-1999 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 6006
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10052354
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 23-Sep-1999 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931076689
Layer: 3
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 85

Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 225.0
Formation End Depth: 252.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931076688
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 6.0
Formation End Depth: 225.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931076687
Layer: 1
Color: 7
General Color: RED
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 6.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115980
Layer: 1
Plug From: 0.0
Plug To: 20.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530820
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10600924
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID:	930091406
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	232.0
Casing Diameter:	7.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	PUMP
Pump Test ID:	991530820
Pump Set At:	
Static Level:	20.0
Final Level After Pumping:	30.0
Recommended Pump Depth:	150.0
Pumping Rate:	40.0
Flowing Rate:	
Recommended Pump Rate:	10.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934386189
Test Type:	Recovery
Test Duration:	30
Test Level:	30.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934663590
Test Type:	Recovery
Test Duration:	45
Test Level:	30.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934119451
Test Type:	Recovery
Test Duration:	15
Test Level:	30.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934903322
Test Type:	Recovery
Test Duration:	60
Test Level:	30.0
Test Level UOM:	ft

Water Details

Water ID:	933491081
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	232.0
Water Found Depth UOM:	ft

Site:
lot 1 ON

Database:
WWIS

Well ID:	1530691	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	11-Aug-1999 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	206743	***Contractor:***	6006
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10052225	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	21-Jul-1999 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931076287
Layer:	1
Color:	7
General Color:	RED
Mat1:	05
Most Common Material:	CLAY
Mat2:	85
Mat2 Desc:	SOFT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0

Formation End Depth: 9.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931076289
Layer: 3
Color: 6
General Color: BROWN
Mat1: 17
Most Common Material: SHALE
Mat2: 80
Mat2 Desc: POROUS
Mat3:
Mat3 Desc:
Formation Top Depth: 52.0
Formation End Depth: 68.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931076288
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 13
Mat2 Desc: BOULDERS
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 9.0
Formation End Depth: 52.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115833
Layer: 1
Plug From: 0.0
Plug To: 20.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530691
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10600795
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930091128

Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 52.0
Casing Diameter: 7.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930091129
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 68.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991530691
Pump Set At:
Static Level: 20.0
Final Level After Pumping: 35.0
Recommended Pump Depth: 60.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934664175
Test Type: Recovery
Test Duration: 45
Test Level: 20.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934120036
Test Type: Recovery
Test Duration: 15
Test Level: 20.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934385657
Test Type: Recovery
Test Duration: 30
Test Level: 20.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID:	934902793
Test Type:	Recovery
Test Duration:	60
Test Level:	20.0
Test Level UOM:	ft

Water Details

Water ID:	933490909
Layer:	1
Kind Code:	3
Kind:	SULPHUR
Water Found Depth:	52.0
Water Found Depth UOM:	ft

Site:
lot 1 ON

Database:
WWIS

Well ID:	1530576	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	09-Jul-1999 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	194890	***Contractor:***	1558
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	LI
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	GLOUCESTER TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10052111	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	30-Jun-1999 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931075936
Layer:	4

Color: 2
General Color: GREY
Mat1: 18
Most Common Material: SANDSTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 63.0
Formation End Depth: 75.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075935
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 29.0
Formation End Depth: 63.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075933
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 79
Mat2 Desc: PACKED
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075934
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 12.0
Formation End Depth: 29.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115724
Layer: 1
Plug From: 0.0
Plug To: 34.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530576
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10600681
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930090894
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 75.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930090893
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 36.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991530576
Pump Set At:
Static Level: 22.0
Final Level After Pumping: 30.0
Recommended Pump Depth: 40.0
Pumping Rate: 30.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 2
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934385133
Test Type: Recovery
Test Duration: 30
Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934902687
Test Type: Recovery
Test Duration: 60
Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934118957
Test Type: Recovery
Test Duration: 15
Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934663096
Test Type: Recovery
Test Duration: 45
Test Level: 23.0
Test Level UOM: ft

Water Details

Water ID: 933490750
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 60.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1530508
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 191088
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 06-May-1999 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 6006
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Site Info:

Bore Hole Information

Bore Hole ID:	10052043	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	28-Apr-1999 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931075734
Layer:	3
Color:	2
General Color:	GREY
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	13
Mat2 Desc:	BOULDERS
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	42.0
Formation End Depth:	55.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931075733
Layer:	2
Color:	3
General Color:	BLUE
Mat1:	05
Most Common Material:	CLAY
Mat2:	85
Mat2 Desc:	SOFT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	12.0
Formation End Depth:	42.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931075735
Layer:	4
Color:	6
General Color:	BROWN
Mat1:	19
Most Common Material:	SLATE
Mat2:	80

Mat2 Desc: POROUS
Mat3:
Mat3 Desc:
Formation Top Depth: 55.0
Formation End Depth: 56.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075732
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115658
Layer: 1
Plug From: 0.0
Plug To: 30.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530508
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10600613
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930090777
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 55.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930090778
Layer: 2

Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 56.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991530508
Pump Set At:
Static Level: 12.0
Final Level After Pumping: 50.0
Recommended Pump Depth: 45.0
Pumping Rate: 15.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934663039
Test Type: Recovery
Test Duration: 45
Test Level: 12.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934902209
Test Type: Recovery
Test Duration: 60
Test Level: 12.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934118900
Test Type: Recovery
Test Duration: 15
Test Level: 12.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934385076
Test Type: Recovery
Test Duration: 30
Test Level: 12.0
Test Level UOM: ft

Water Details

Water ID: 933490672
Layer: 1

Kind Code: 1
Kind: FRESH
Water Found Depth: 55.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1530387
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 194587
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 01-Dec-1998 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051922
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 08-Jul-1998 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931075339
Layer: 1
Color: 6
General Color: BROWN
Mat1: 01
Most Common Material: FILL
Mat2: 26
Mat2 Desc: ROCK
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 0.0
Formation End Depth: 5.0
Formation End Depth UOM: ft

Overburden and Bedrock

Materials Interval

Formation ID:	931075340
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	85
Mat2 Desc:	SOFT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	5.0
Formation End Depth:	336.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933115531
Layer:	1
Plug From:	6.0
Plug To:	40.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961530387
Method Construction Code:	4
Method Construction:	Rotary (Air)
Other Method Construction:	

Pipe Information

Pipe ID:	10600492
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930090531
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	336.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930090530
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	40.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	PUMP
Pump Test ID:	991530387
Pump Set At:	
Static Level:	82.0
Final Level After Pumping:	336.0
Recommended Pump Depth:	300.0
Pumping Rate:	9.0
Flowing Rate:	
Recommended Pump Rate:	8.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934662514
Test Type:	
Test Duration:	45
Test Level:	150.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934902101
Test Type:	
Test Duration:	60
Test Level:	115.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934118376
Test Type:	
Test Duration:	15
Test Level:	253.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934393364
Test Type:	
Test Duration:	30
Test Level:	190.0
Test Level UOM:	ft

Water Details

Water ID:	933490496
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	250.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933490495

Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 190.0
Water Found Depth UOM: ft

Water Details

Water ID: 933490497
Layer: 3
Kind Code: 1
Kind: FRESH
Water Found Depth: 290.0
Water Found Depth UOM: ft

Water Details

Water ID: 933490498
Layer: 4
Kind Code: 1
Kind: FRESH
Water Found Depth: 310.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1518217
Construction Date:
Use 1st: Domestic
Use 2nd: Livestock
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: OTTAWA CITY
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 06-May-1983 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3644
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10040087
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 21-Mar-1983 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931037740
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 13
Mat2 Desc: BOULDERS
Mat3: 14
Mat3 Desc: HARDPAN
Formation Top Depth: 15.0
Formation End Depth: 35.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931037741
Layer: 3
Color: 2
General Color: GREY
Mat1: 13
Most Common Material: BOULDERS
Mat2: 14
Mat2 Desc: HARDPAN
Mat3:
Mat3 Desc:
Formation Top Depth: 35.0
Formation End Depth: 52.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931037742
Layer: 4
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 52.0
Formation End Depth: 167.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931037739
Layer: 1
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:

Formation Top Depth: 0.0
Formation End Depth: 15.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961518217
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10588657
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930069993
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 167.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930069992
Layer: 1
Material:
Open Hole or Material:
Depth From:
Depth To: 53.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991518217
Pump Set At:
Static Level: 25.0
Final Level After Pumping: 60.0
Recommended Pump Depth: 90.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code:
Water State After Test:
Pumping Test Method: 2
Pumping Duration HR: 2
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934897806
Test Type:
Test Duration: 60
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934103534
Test Type:
Test Duration: 15
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934378286
Test Type:
Test Duration: 30
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934639345
Test Type:
Test Duration: 45
Test Level: 60.0
Test Level UOM: ft

Water Details

Water ID: 933474887
Layer: 3
Kind Code: 5
Kind: Not stated
Water Found Depth: 162.0
Water Found Depth UOM: ft

Water Details

Water ID: 933474885
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 80.0
Water Found Depth UOM: ft

Water Details

Water ID: 933474886
Layer: 2
Kind Code: 5
Kind: Not stated
Water Found Depth: 148.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database: ***WWIS***

Well ID: 1530290
Construction Date:

Flowing (Y/N):
Flow Rate:

Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	20-Nov-1998 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	197031	***Contractor:***	1414
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10051825	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	14-Nov-1998 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931075069
Layer:	3
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	71
Mat2 Desc:	FRACTURED
Mat3:	
Mat3 Desc:	
Formation Top Depth:	21.0
Formation End Depth:	32.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931075067
Layer:	1
Color:	8
General Color:	BLACK
Mat1:	03
Most Common Material:	MUCK
Mat2:	85
Mat2 Desc:	SOFT

Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 4.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075070
Layer: 4
Color: 6
General Color: BROWN
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 74
Mat2 Desc: LAYERED
Mat3:
Mat3 Desc:
Formation Top Depth: 32.0
Formation End Depth: 153.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075068
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 4.0
Formation End Depth: 21.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115424
Layer: 1
Plug From: 0.0
Plug To: 27.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530290
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10600395
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930090303
Layer: 2
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 27.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930090302
Layer: 1
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 23.0
Casing Diameter: 8.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930090304
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991530290
Pump Set At:
Static Level: 25.0
Final Level After Pumping: 150.0
Recommended Pump Depth:
Pumping Rate: 4.0
Flowing Rate:
Recommended Pump Rate: 3.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934118292
Test Type: Recovery
Test Duration: 15
Test Level: 90.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934392859
Test Type: Recovery
Test Duration: 30
Test Level: 55.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934662430
Test Type: Recovery
Test Duration: 45
Test Level: 41.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934910974
Test Type: Recovery
Test Duration: 60
Test Level: 40.0
Test Level UOM: ft

Water Details

Water ID: 933490353
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 100.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database: ***WWIS***

Well ID: 1530280
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Abandoned-Other
Water Type:
Casing Material:
Audit No: 175701
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 16-Nov-1998 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 9999
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051815
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9

Date Completed: 21-Sep-1998 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
UTMRC Desc: unknown UTM
Location Method: na

Annular Space/Abandonment Sealing Record

Plug ID: 933115411
Layer: 1
Plug From: 0.0
Plug To: 75.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530280
Method Construction Code: 7
Method Construction: Diamond
Other Method Construction:

Pipe Information

Pipe ID: 10600385
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930090290
Layer: 1
Material: 3
Open Hole or Material: CONCRETE
Depth From:
Depth To:
Casing Diameter: 28.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Water Details

Water ID: 933490347
Layer: 1
Kind Code: 2
Kind: SALTY
Water Found Depth: 25.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database: ***WWIS***

Well ID: 1530271
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 06-Nov-1998 00:00:00
Selected Flag: TRUE

Casing Material:
Audit No: 191058
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Abandonment Rec:
Contractor: 6006
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051806
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 25-Sep-1998 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931075013
Layer: 1
Color: 7
General Color: RED
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 9.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075016
Layer: 4
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 42.0
Formation End Depth: 53.0

Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075015
Layer: 3
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 30.0
Formation End Depth: 42.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075014
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 9.0
Formation End Depth: 30.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931075017
Layer: 5
Color: 6
General Color: BROWN
Mat1: 17
Most Common Material: SHALE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 53.0
Formation End Depth: 55.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115403
Layer: 1
Plug From: 0.0
Plug To: 20.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530271
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10600376
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930090274
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 53.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930090275
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 55.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991530271
Pump Set At:
Static Level: 12.0
Final Level After Pumping: 30.0
Recommended Pump Depth: 45.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934392846
Test Type: Recovery
Test Duration: 30
Test Level: 12.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID:	934662417
Test Type:	Recovery
Test Duration:	45
Test Level:	12.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934910963
Test Type:	Recovery
Test Duration:	60
Test Level:	12.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934117862
Test Type:	Recovery
Test Duration:	15
Test Level:	30.0
Test Level UOM:	ft

Water Details

Water ID:	933490339
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	53.0
Water Found Depth UOM:	ft

Site:
lot 3 ON

Database:
WWIS

Well ID:	1530014	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	04-May-1998 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	178981	***Contractor:***	1414
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10051549	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	

Cluster Kind:
Date Completed: 29-Apr-1998 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931074206
Layer: 5
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3: 17
Mat3 Desc: SHALE
Formation Top Depth: 183.0
Formation End Depth: 228.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931074204
Layer: 3
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 105.0
Formation End Depth: 160.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931074202
Layer: 1
Color: 7
General Color: RED
Mat1: 05
Most Common Material: CLAY
Mat2: 66
Mat2 Desc: DENSE
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 25.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931074203
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 25.0
Formation End Depth: 105.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931074205
Layer: 4
Color: 2
General Color: GREY
Mat1: 28
Most Common Material: SAND
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 160.0
Formation End Depth: 183.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933115130
Layer: 1
Plug From: 0.0
Plug To: 25.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961530014
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10600119
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930089807
Layer: 2
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 183.0
Casing Diameter: 6.0
Casing Diameter UOM: inch

Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930089806
Layer: 1
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 25.0
Casing Diameter: 8.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930089808
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 228.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991530014
Pump Set At:
Static Level: 105.0
Final Level After Pumping: 228.0
Recommended Pump Depth: 210.0
Pumping Rate: 5.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934117230
Test Type: Recovery
Test Duration: 15
Test Level: 200.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934909905
Test Type: Recovery
Test Duration: 60
Test Level: 140.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934661366
Test Type: Recovery
Test Duration: 45
Test Level: 160.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934392208
Test Type: Recovery
Test Duration: 30
Test Level: 180.0
Test Level UOM: ft

Water Details

Water ID: 933490025
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 220.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1529778
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 184948
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 11-Dec-1997 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 6006
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name: CON
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051313
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 22-Oct-1997 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID:	931073798
Layer:	2
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	85
Mat2 Desc:	SOFT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	15.0
Formation End Depth:	25.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931073799
Layer:	3
Color:	2
General Color:	GREY
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	85
Mat2 Desc:	SOFT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	25.0
Formation End Depth:	30.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931073797
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	85
Mat2 Desc:	SOFT
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	15.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933114847
Layer:	1
Plug From:	0.0
Plug To:	20.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961529778
Method Construction Code:	1

Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10599883
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930089585
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 30.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991529778
Pump Set At:
Static Level: 15.0
Final Level After Pumping: 20.0
Recommended Pump Depth: 25.0
Pumping Rate: 35.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934116717
Test Type: Recovery
Test Duration: 15
Test Level: 20.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934391691
Test Type: Recovery
Test Duration: 30
Test Level: 20.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934660853
Test Type: Recovery
Test Duration: 45
Test Level: 20.0

Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934909809
Test Type: Recovery
Test Duration: 60
Test Level: 20.0
Test Level UOM: ft

Water Details

Water ID: 933489834
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 30.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database: ***WWIS***

Well ID: 1529774
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 184956
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 11-Dec-1997 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 6006
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051309
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 21-Nov-1997 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931073784
Layer: 4
Color: 6
General Color: BROWN
Mat1: 17
Most Common Material: SHALE
Mat2: 80
Mat2 Desc: POROUS
Mat3:
Mat3 Desc:
Formation Top Depth: 48.0
Formation End Depth: 87.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931073783
Layer: 3
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 13
Mat2 Desc: BOULDERS
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 25.0
Formation End Depth: 48.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931073781
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931073782
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 12.0
Formation End Depth: 25.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933114843
Layer: 1
Plug From: 0.0
Plug To: 20.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961529774
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10599879
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930089577
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 48.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930089578
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 87.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991529774
Pump Set At:
Static Level: 25.0
Final Level After Pumping: 82.0
Recommended Pump Depth: 85.0
Pumping Rate: 4.0
Flowing Rate:
Recommended Pump Rate: 3.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 2

Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934116713
Test Type: Recovery
Test Duration: 15
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934391687
Test Type: Recovery
Test Duration: 30
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934660849
Test Type: Recovery
Test Duration: 45
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934909805
Test Type: Recovery
Test Duration: 60
Test Level: 25.0
Test Level UOM: ft

Water Details

Water ID: 933489830
Layer: 1
Kind Code: 3
Kind: SULPHUR
Water Found Depth: 48.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1529708
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 183347
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 22-Dec-1997 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1558
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name: LI
Easting NAD83:
Northing NAD83:
Zone:

Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10051243
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 02-Oct-1997 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931073573
Layer: 2
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2: 13
Mat2 Desc: BOULDERS
Mat3: 79
Mat3 Desc: PACKED
Formation Top Depth: 8.0
Formation End Depth: 30.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931073574
Layer: 3
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 81
Mat2 Desc: SANDY
Mat3: 79
Mat3 Desc: PACKED
Formation Top Depth: 30.0
Formation End Depth: 42.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931073572
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05

Most Common Material: CLAY
Mat2: 12
Mat2 Desc: STONES
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 0.0
Formation End Depth: 8.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931073577
Layer: 6
Color: 2
General Color: GREY
Mat1: 21
Most Common Material: GRANITE
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 247.0
Formation End Depth: 270.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931073575
Layer: 4
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 42.0
Formation End Depth: 68.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931073576
Layer: 5
Color: 1
General Color: WHITE
Mat1: 18
Most Common Material: SANDSTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 68.0
Formation End Depth: 247.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933114771
Layer: 1

Plug From: 424.0
Plug To:
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961529708
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10599813
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930089437
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 44.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930089438
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 150.0
Casing Diameter: 5.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930089439
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 270.0
Casing Diameter: 5.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991529708
Pump Set At:
Static Level: 30.0
Final Level After Pumping: 100.0
Recommended Pump Depth: 100.0
Pumping Rate: 10.0

Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934909332
Test Type: Recovery
Test Duration: 60
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934660795
Test Type: Recovery
Test Duration: 45
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934116659
Test Type: Recovery
Test Duration: 15
Test Level: 37.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934391633
Test Type: Recovery
Test Duration: 30
Test Level: 31.0
Test Level UOM: ft

Water Details

Water ID: 933489739
Layer: 2
Kind Code: 5
Kind: Not stated
Water Found Depth: 245.0
Water Found Depth UOM: ft

Water Details

Water ID: 933489738
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 48.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1528977
Construction Date:
Use 1st: Commerical
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 169410
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 10-Jun-1996 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1414
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10050513
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 29-May-1996 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931071370
Layer: 3
Color: 2
General Color: GREY
Mat1: 11
Most Common Material: GRAVEL
Mat2: 13
Mat2 Desc: BOULDERS
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 80.0
Formation End Depth: 85.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931071368
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05

Most Common Material: CLAY
Mat2: 66
Mat2 Desc: DENSE
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 8.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931071371
Layer: 4
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3: 74
Mat3 Desc: LAYERED
Formation Top Depth: 85.0
Formation End Depth: 92.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931071369
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 8.0
Formation End Depth: 80.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933113977
Layer: 1
Plug From: 5.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961528977
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10599083
Casing No: 1
Comment:

Alt Name:

Construction Record - Casing

Casing ID:	930088277
Layer:	2
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	92.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930088276
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	85.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	PUMP
Pump Test ID:	991528977
Pump Set At:	
Static Level:	-1.0
Final Level After Pumping:	92.0
Recommended Pump Depth:	50.0
Pumping Rate:	30.0
Flowing Rate:	
Recommended Pump Rate:	10.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	Yes

Draw Down & Recovery

Pump Test Detail ID:	934389454
Test Type:	Recovery
Test Duration:	30
Test Level:	-1.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934907575
Test Type:	Recovery
Test Duration:	60
Test Level:	-1.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID: 934105828
Test Type: Recovery
Test Duration: 15
Test Level: -1.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934658629
Test Type: Recovery
Test Duration: 45
Test Level: -1.0
Test Level UOM: ft

Water Details

Water ID: 933488886
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 90.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1528660
Construction Date:
Use 1st: Municipal
Use 2nd:
Final Well Status:
Water Type:
Casing Material:
Audit No: 147554
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 03-Aug-1995 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 4006
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name: LI
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10050196
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 21-Jun-1995 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID:	931070394
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	17
Mat2 Desc:	SHALE
Mat3:	74
Mat3 Desc:	LAYERED
Formation Top Depth:	34.0
Formation End Depth:	41.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931070395
Layer:	3
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	41.0
Formation End Depth:	110.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931070396
Layer:	4
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	12
Mat2 Desc:	STONES
Mat3:	74
Mat3 Desc:	LAYERED
Formation Top Depth:	110.0
Formation End Depth:	130.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931070393
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	05
Most Common Material:	CLAY
Mat2:	12
Mat2 Desc:	STONES
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0

Formation End Depth: 34.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933113580
Layer: 2
Plug From: 15.0
Plug To: 115.0
Plug Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933113581
Layer: 3
Plug From: 115.0
Plug To: 130.0
Plug Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933113579
Layer: 1
Plug From: 0.0
Plug To: 15.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961528660
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10598766
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930087738
Layer: 1
Material:
Open Hole or Material:
Depth From:
Depth To: 130.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Water Details

Water ID: 933488459
Layer: 1
Kind Code: 5
Kind: Not stated

Water Found Depth: 127.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1528111
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 126246
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 08-Aug-1994 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 4006
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10049650
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 17-Jul-1994 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931068611
Layer: 3
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 12
Mat2 Desc: STONES
Mat3: 11
Mat3 Desc: GRAVEL
Formation Top Depth: 290.0
Formation End Depth: 300.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931068612
Layer: 4
Color: 8
General Color: BLACK
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 300.0
Formation End Depth: 305.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931068609
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 3.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931068610
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 3.0
Formation End Depth: 290.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933112978
Layer: 1
Plug From: 0.0
Plug To: 30.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961528111
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID:	10598220
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930086755
Layer:	3
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	305.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930086753
Layer:	1
Material:	4
Open Hole or Material:	OPEN HOLE
Depth From:	
Depth To:	300.0
Casing Diameter:	10.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Construction Record - Casing

Casing ID:	930086754
Layer:	2
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	300.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	PUMP
Pump Test ID:	991528111
Pump Set At:	
Static Level:	12.0
Final Level After Pumping:	97.0
Recommended Pump Depth:	250.0
Pumping Rate:	5.0
Flowing Rate:	
Recommended Pump Rate:	5.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	1
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID: 934112374
Test Type:
Test Duration: 15
Test Level: 39.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934387183
Test Type:
Test Duration: 30
Test Level: 53.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934656511
Test Type:
Test Duration: 45
Test Level: 72.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934904882
Test Type:
Test Duration: 60
Test Level: 97.0
Test Level UOM: ft

Water Details

Water ID: 933487699
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 303.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1528094
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 139592
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 25-Aug-1994 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10049634
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 09-Aug-1994 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931068560
Layer: 2
Color: 2
General Color: GREY
Mat1: 14
Most Common Material: HARDPAN
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 2.0
Formation End Depth: 14.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931068559
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 2.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931068561
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 14.0

Formation End Depth: 168.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933112968
Layer: 1
Plug From: 2.0
Plug To: 20.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961528094
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10598204
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930086730
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 40.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991528094
Pump Set At:
Static Level: 70.0
Final Level After Pumping: 140.0
Recommended Pump Depth: 160.0
Pumping Rate: 10.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934656496
Test Type: Draw Down
Test Duration: 45

Test Level: 140.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934112359
Test Type: Draw Down
Test Duration: 15
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934904867
Test Type: Draw Down
Test Duration: 60
Test Level: 140.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934387168
Test Type: Draw Down
Test Duration: 30
Test Level: 130.0
Test Level UOM: ft

Water Details

Water ID: 933487681
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 105.0
Water Found Depth UOM: ft

Water Details

Water ID: 933487682
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 165.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database: ***WWIS***

Well ID: 1528093
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 139591
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 25-Aug-1994 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:

Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10049633
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 15-Aug-1994 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931068557
Layer: 1
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3: 17
Mat3 Desc: SHALE
Formation Top Depth: 0.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931068558
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 12.0
Formation End Depth: 280.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933112967
Layer: 1
Plug From: 6.0
Plug To: 40.0

Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961528093
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10598203
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930086729
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 40.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991528093
Pump Set At:
Static Level: 50.0
Final Level After Pumping: 280.0
Recommended Pump Depth: 270.0
Pumping Rate: 2.0
Flowing Rate:
Recommended Pump Rate: 2.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934904866
Test Type: Draw Down
Test Duration: 60
Test Level: 280.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934112358
Test Type: Draw Down
Test Duration: 15
Test Level: 180.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934656495
Test Type: Draw Down
Test Duration: 45
Test Level: 280.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934387167
Test Type: Draw Down
Test Duration: 30
Test Level: 280.0
Test Level UOM: ft

Water Details

Water ID: 933487680
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 140.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database: ***WWIS***

Well ID: 1526826
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 121999
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 27-Jan-1993 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10048514
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 04-Dec-1992 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931065294
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 42.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931065296
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 98.0
Formation End Depth: 107.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931065295
Layer: 2
Color: 2
General Color: GREY
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 42.0
Formation End Depth: 98.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933111993
Layer: 1
Plug From: 0.0
Plug To: 25.0
Plug Depth UOM: ft

Method of Construction & Well

Use

Method Construction ID: 961526826
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10597084
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930084961
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 98.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991526826
Pump Set At:
Static Level: 40.0
Final Level After Pumping: 40.0
Recommended Pump Depth: 80.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934653138
Test Type: Draw Down
Test Duration: 45
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934108991
Test Type: Draw Down
Test Duration: 15
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934392625
Test Type: Draw Down
Test Duration: 30
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934910329
Test Type: Draw Down
Test Duration: 60
Test Level: 40.0
Test Level UOM: ft

Water Details

Water ID: 933486271
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 102.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1526661
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 116360
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 13-Nov-1992 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10048352
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 04-Nov-1992 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931064793
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 23.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931064794
Layer: 2
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 23.0
Formation End Depth: 32.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933111878
Layer: 1
Plug From: 0.0
Plug To: 22.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961526661
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10596922
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930084651
Layer: 1
Material: 1
Open Hole or Material: STEEL

Depth From:
Depth To: 23.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991526661
Pump Set At:
Static Level: 9.0
Final Level After Pumping: 27.0
Recommended Pump Depth: 30.0
Pumping Rate: 5.0
Flowing Rate:
Recommended Pump Rate: 4.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 10
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934652559
Test Type: Draw Down
Test Duration: 45
Test Level: 27.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934392046
Test Type: Draw Down
Test Duration: 30
Test Level: 26.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934108412
Test Type: Draw Down
Test Duration: 15
Test Level: 14.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934909754
Test Type: Draw Down
Test Duration: 60
Test Level: 27.0
Test Level UOM: ft

Water Details

Water ID: 933486039
Layer: 1
Kind Code: 1
Kind: FRESH

Water Found Depth: 29.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1526513
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 116381
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 24-Sep-1992 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10048214
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 21-Aug-1992 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931064385
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 9.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931064386
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 9.0
Formation End Depth: 41.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931064388
Layer: 4
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 59.0
Formation End Depth: 70.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931064387
Layer: 3
Color: 2
General Color: GREY
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 41.0
Formation End Depth: 59.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933111758
Layer: 1
Plug From: 2.0
Plug To: 25.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961526513
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID:	10596784
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930084423
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	59.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991526513
Pump Set At:	
Static Level:	9.0
Final Level After Pumping:	61.0
Recommended Pump Depth:	65.0
Pumping Rate:	4.0
Flowing Rate:	
Recommended Pump Rate:	65.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	10
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934391522
Test Type:	
Test Duration:	30
Test Level:	55.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934652040
Test Type:	
Test Duration:	45
Test Level:	61.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934107890
Test Type:	
Test Duration:	15
Test Level:	51.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID: 934909237
Test Type:
Test Duration: 60
Test Level: 61.0
Test Level UOM: ft

Water Details

Water ID: 933485856
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 59.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1526037
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 84935
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 13-Jan-1992 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2348
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10047772
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 29-Nov-1991 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931063041
Layer: 2
Color:
General Color:

Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 20.0
Formation End Depth: 65.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931063040
Layer: 1
Color:
General Color:
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 20.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931063042
Layer: 3
Color:
General Color:
Mat1: 11
Most Common Material: GRAVEL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 65.0
Formation End Depth: 70.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931063043
Layer: 4
Color:
General Color:
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 17
Mat2 Desc: SHALE
Mat3:
Mat3 Desc:
Formation Top Depth: 70.0
Formation End Depth: 85.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961526037

Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10596342
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930083642
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 70.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991526037
Pump Set At:
Static Level: 75.0
Final Level After Pumping: 80.0
Recommended Pump Depth: 80.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 15.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934106229
Test Type:
Test Duration: 15
Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934650386
Test Type:
Test Duration: 45
Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934908004
Test Type:
Test Duration: 60

Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934389863
Test Type:
Test Duration: 30
Test Level: 80.0
Test Level UOM: ft

Water Details

Water ID: 933485213
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 78.0
Water Found Depth UOM: ft

Water Details

Water ID: 933485214
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 82.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1525763
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 91560
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 10-Oct-1991 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10047498
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 09-Aug-1991 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931062202
Layer: 1
Color: 6
General Color: BROWN
Mat1: 01
Most Common Material: FILL
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 12
Mat3 Desc: STONES
Formation Top Depth: 0.0
Formation End Depth: 6.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931062203
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 78
Mat2 Desc: MEDIUM-GRAINED
Mat3: 73
Mat3 Desc: HARD
Formation Top Depth: 6.0
Formation End Depth: 220.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933111359
Layer: 1
Plug From: 6.0
Plug To: 42.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525763
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10596068
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID:	930083151
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	42.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991525763
Pump Set At:	
Static Level:	18.0
Final Level After Pumping:	125.0
Recommended Pump Depth:	210.0
Pumping Rate:	15.0
Flowing Rate:	
Recommended Pump Rate:	10.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934649751
Test Type:	
Test Duration:	45
Test Level:	122.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934388794
Test Type:	
Test Duration:	30
Test Level:	61.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934906930
Test Type:	
Test Duration:	60
Test Level:	125.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934105135
Test Type:	
Test Duration:	15
Test Level:	38.0
Test Level UOM:	ft

Water Details

Water ID:	933484858
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	194.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933484857
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	160.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933484859
Layer:	3
Kind Code:	1
Kind:	FRESH
Water Found Depth:	210.0
Water Found Depth UOM:	ft

Site:
lot 1 ON

Database:
WWIS

Well ID:	1525663	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	21-Oct-1991 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	095171	***Contractor:***	2351
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10047398	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	02-Oct-1991 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			

Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931061959
Layer: 1
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 157.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525663
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10595968
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930082969
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To:
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991525663
Pump Set At:
Static Level: 78.0
Final Level After Pumping: 139.0
Recommended Pump Depth: 157.0
Pumping Rate: 8.0
Flowing Rate:
Recommended Pump Rate: 6.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2

Pumping Duration HR: 1
Pumping Duration MIN: 40
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934105038
Test Type:
Test Duration: 15
Test Level: 97.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934906415
Test Type:
Test Duration: 60
Test Level: 139.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934388697
Test Type:
Test Duration: 30
Test Level: 123.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934649235
Test Type:
Test Duration: 45
Test Level: 138.0
Test Level UOM: ft

Water Details

Water ID: 933484713
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 143.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1525342
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 67190
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 04-Feb-1991 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:

Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10047080
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 20-Nov-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931060833
Layer: 2
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 5.0
Formation End Depth: 19.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060836
Layer: 5
Color: 8
General Color: BLACK
Mat1: 11
Most Common Material: GRAVEL
Mat2: 31
Mat2 Desc: COARSE GRAVEL
Mat3:
Mat3 Desc:
Formation Top Depth: 60.0
Formation End Depth: 69.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060832
Layer: 1
Color: 6
General Color: BROWN

Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 5.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060834
Layer: 3
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 19.0
Formation End Depth: 34.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060835
Layer: 4
Color: 8
General Color: BLACK
Mat1: 14
Most Common Material: HARDPAN
Mat2: 28
Mat2 Desc: SAND
Mat3:
Mat3 Desc:
Formation Top Depth: 34.0
Formation End Depth: 60.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933111157
Layer: 1
Plug From: 2.0
Plug To: 25.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525342
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10595650
Casing No: 1

Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930082426
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 68.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991525342
Pump Set At:
Static Level: 29.0
Final Level After Pumping: 60.0
Recommended Pump Depth: 65.0
Pumping Rate: 6.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 45
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934905300
Test Type: Draw Down
Test Duration: 60
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934112173
Test Type: Draw Down
Test Duration: 15
Test Level: 51.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934648121
Test Type: Draw Down
Test Duration: 45
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934387578
Test Type: Draw Down
Test Duration: 30

Test Level: 58.0
Test Level UOM: ft

Water Details

Water ID: 933484307
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 69.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1525341
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 67191
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 04-Feb-1991 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10047079
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 30-Nov-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931060831
Layer: 2
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:

Mat3:
Mat3 Desc:
Formation Top Depth: 14.0
Formation End Depth: 200.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060830
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 14.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933111156
Layer: 1
Plug From: 0.0
Plug To: 22.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525341
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10595649
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930082425
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 22.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991525341
Pump Set At:

Static Level:	27.0
Final Level After Pumping:	190.0
Recommended Pump Depth:	195.0
Pumping Rate:	1.0
Flowing Rate:	
Recommended Pump Rate:	1.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934387577
Test Type:	Draw Down
Test Duration:	30
Test Level:	145.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934905299
Test Type:	Draw Down
Test Duration:	60
Test Level:	190.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934112172
Test Type:	Draw Down
Test Duration:	15
Test Level:	105.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934648120
Test Type:	Draw Down
Test Duration:	45
Test Level:	190.0
Test Level UOM:	ft

Water Details

Water ID:	933484306
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	38.0
Water Found Depth UOM:	ft

Site:
lot 1 ON

Database:
WWIS

Well ID:	1525088	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	01-Nov-1990 00:00:00

Water Type:
Casing Material:
Audit No: 69444
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046830
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 24-Aug-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931060038
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2: 05
Mat2 Desc: CLAY
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 8.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060040
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 10.0

Formation End Depth: 400.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060039
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 8.0
Formation End Depth: 10.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933111027
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525088
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10595400
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930082021
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 41.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991525088
Pump Set At:
Static Level: 165.0
Final Level After Pumping: 399.0
Recommended Pump Depth: 390.0

Pumping Rate: 3.0
Flowing Rate:
Recommended Pump Rate: 1.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR:
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934656282
Test Type: Draw Down
Test Duration: 45
Test Level: 345.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386503
Test Type: Draw Down
Test Duration: 30
Test Level: 270.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934111096
Test Type: Draw Down
Test Duration: 15
Test Level: 305.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934904654
Test Type: Draw Down
Test Duration: 60
Test Level: 399.0
Test Level UOM: ft

Water Details

Water ID: 933483954
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 350.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1525083
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 69473

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 01-Nov-1990 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517

Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046825
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 14-Sep-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931060017
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 8.0
Formation End Depth: 60.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060019
Layer: 4
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 120.0
Formation End Depth: 400.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060018
Layer: 3
Color: 8
General Color: BLACK
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 60.0
Formation End Depth: 120.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931060016
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 8.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933111022
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525083
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10595395
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930082016
Layer: 1
Material: 1
Open Hole or Material: STEEL

Depth From:
Depth To: 40.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991525083
Pump Set At:
Static Level: 205.0
Final Level After Pumping: 399.0
Recommended Pump Depth: 390.0
Pumping Rate: 3.0
Flowing Rate:
Recommended Pump Rate:
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934904649
Test Type:
Test Duration: 60
Test Level: 399.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934111091
Test Type:
Test Duration: 15
Test Level: 250.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386498
Test Type:
Test Duration: 30
Test Level: 310.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934656277
Test Type:
Test Duration: 45
Test Level: 360.0
Test Level UOM: ft

Water Details

Water ID: 933483949
Layer: 1
Kind Code: 1
Kind: FRESH

Water Found Depth: 350.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1525011
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 80368
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 31-Oct-1990 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1558
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046753
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 21-Sep-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931059754
Layer: 5
Color: 2
General Color: GREY
Mat1: 14
Most Common Material: HARDPAN
Mat2: 11
Mat2 Desc: GRAVEL
Mat3: 79
Mat3 Desc: PACKED
Formation Top Depth: 79.0
Formation End Depth: 103.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059752
Layer: 3
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 90
Mat2 Desc: VERY
Mat3: 85
Mat3 Desc: SOFT
Formation Top Depth: 39.0
Formation End Depth: 74.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059755
Layer: 6
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 74
Mat2 Desc: LAYERED
Mat3: 78
Mat3 Desc: MEDIUM-GRAINED
Formation Top Depth: 103.0
Formation End Depth: 310.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059750
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 79
Mat2 Desc: PACKED
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 25.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059753
Layer: 4
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 74.0
Formation End Depth: 79.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059751
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 25.0
Formation End Depth: 39.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525011
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10595323
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081882
Layer: 3
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 310.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930081881
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 300.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930081880
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 106.0
Casing Diameter: 6.0

Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991525011
Pump Set At:
Static Level: 68.0
Final Level After Pumping: 105.0
Recommended Pump Depth: 250.0
Pumping Rate: 12.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934110603
Test Type: Draw Down
Test Duration: 15
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934904163
Test Type: Draw Down
Test Duration: 60
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386010
Test Type: Draw Down
Test Duration: 30
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655789
Test Type: Draw Down
Test Duration: 45
Test Level: 105.0
Test Level UOM: ft

Water Details

Water ID: 933483830
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 185.0
Water Found Depth UOM: ft

Water Details

Water ID:	933483831
Layer:	2
Kind Code:	5
Kind:	Not stated
Water Found Depth:	306.0
Water Found Depth UOM:	ft

Site:
lot 3 ON

Database:
WWIS

Well ID:	1525010	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	31-Oct-1990 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	80369	***Contractor:***	1558
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	GLOUCESTER TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10046752	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	18-Sep-1990 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931059746
Layer:	3
Color:	3
General Color:	BLUE
Mat1:	05
Most Common Material:	CLAY
Mat2:	90
Mat2 Desc:	VERY
Mat3:	85
Mat3 Desc:	SOFT
Formation Top Depth:	43.0

Formation End Depth: 85.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059747
Layer: 4
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 79
Mat2 Desc: PACKED
Mat3:
Mat3 Desc:
Formation Top Depth: 85.0
Formation End Depth: 94.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059744
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2: 79
Mat2 Desc: PACKED
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 24.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059745
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 24.0
Formation End Depth: 43.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059748
Layer: 5
Color: 2
General Color: GREY
Mat1: 14
Most Common Material: HARDPAN
Mat2: 11
Mat2 Desc: GRAVEL

Mat3: 79
Mat3 Desc: PACKED
Formation Top Depth: 94.0
Formation End Depth: 96.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059749
Layer: 6
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 74
Mat2 Desc: LAYERED
Mat3: 78
Mat3 Desc: MEDIUM-GRAINED
Formation Top Depth: 96.0
Formation End Depth: 175.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525010
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10595322
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081878
Layer: 1
Material:
Open Hole or Material:
Depth From:
Depth To: 99.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930081879
Layer: 2
Material:
Open Hole or Material:
Depth From:
Depth To: 175.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991525010
Pump Set At:
Static Level: 73.0
Final Level After Pumping: 100.0
Recommended Pump Depth: 150.0
Pumping Rate: 15.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934110602
Test Type: Draw Down
Test Duration: 15
Test Level: 100.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386009
Test Type: Draw Down
Test Duration: 30
Test Level: 100.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655788
Test Type: Draw Down
Test Duration: 45
Test Level: 100.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934904162
Test Type: Draw Down
Test Duration: 60
Test Level: 100.0
Test Level UOM: ft

Water Details

Water ID: 933483829
Layer: 1
Kind Code: 5
Kind: Not stated
Water Found Depth: 168.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database: ***WWIS***

Well ID: 1525008
Construction Date:

Flowing (Y/N):
Flow Rate:

Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	17-Sep-1990 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	83374	***Contractor:***	6006
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10046750	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	02-Aug-1990 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931059735
Layer:	2
Color:	6
General Color:	BROWN
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Mat2 Desc:	HARD
Mat3:	
Mat3 Desc:	
Formation Top Depth:	310.0
Formation End Depth:	317.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931059734
Layer:	1
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	73
Mat2 Desc:	HARD

Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 310.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059736
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 317.0
Formation End Depth: 345.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110997
Layer: 1
Plug From: 0.0
Plug To: 44.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961525008
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10595320
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081874
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 44.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930081875
Layer: 2
Material: 4

Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 345.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991525008
Pump Set At:
Static Level: 50.0
Final Level After Pumping: 342.0
Recommended Pump Depth: 340.0
Pumping Rate: 2.0
Flowing Rate:
Recommended Pump Rate: 3.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934110600
Test Type:
Test Duration: 15
Test Level: 250.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655786
Test Type:
Test Duration: 45
Test Level: 342.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934904160
Test Type:
Test Duration: 60
Test Level: 342.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386007
Test Type:
Test Duration: 30
Test Level: 300.0
Test Level UOM: ft

Water Details

Water ID: 933483826
Layer: 1
Kind Code: 1

Kind: FRESH
Water Found Depth: 65.0
Water Found Depth UOM: ft

Water Details

Water ID: 933483827
Layer: 2
Kind Code: 3
Kind: SULPHUR
Water Found Depth: 340.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1524829
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 56350
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 17-Sep-1990 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3644
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name: BF
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046575
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 02-May-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931059235
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:

Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 26.0
Formation End Depth: 63.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059234
Layer: 1
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 26.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961524829
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10595145
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081539
Layer: 2
Material: 3
Open Hole or Material: CONCRETE
Depth From:
Depth To: 63.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930081538
Layer: 1
Material:
Open Hole or Material:
Depth From:
Depth To: 29.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991524829
Pump Set At:
Static Level: 10.0
Final Level After Pumping: 30.0
Recommended Pump Depth: 30.0
Pumping Rate: 30.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934110011
Test Type:
Test Duration: 15
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903575
Test Type:
Test Duration: 60
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934385420
Test Type:
Test Duration: 30
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655198
Test Type:
Test Duration: 45
Test Level: 30.0
Test Level UOM: ft

Water Details

Water ID: 933483589
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 54.0
Water Found Depth UOM: ft

Site: ***Database:*** ***WWIS***
lot 3 ON

Well ID: 1524826 ***Flowing (Y/N):***

Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 56399
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 17-Sep-1990 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3644
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046572
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 09-Jan-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931059227
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 37.0
Formation End Depth: 63.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059225
Layer: 1
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 12

Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 28.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059226
Layer: 2
Color: 2
General Color: GREY
Mat1: 14
Most Common Material: HARDPAN
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 28.0
Formation End Depth: 37.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961524826
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10595142
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081533
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 63.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930081532
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 40.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991524826
Pump Set At:
Static Level: 15.0
Final Level After Pumping: 40.0
Recommended Pump Depth: 40.0
Pumping Rate: 25.0
Flowing Rate:
Recommended Pump Rate: 15.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934385417
Test Type:
Test Duration: 30
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903572
Test Type:
Test Duration: 60
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934110008
Test Type:
Test Duration: 15
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655195
Test Type:
Test Duration: 45
Test Level: 40.0
Test Level UOM: ft

Water Details

Water ID: 933483584
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 57.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database: ***WWIS***

Well ID: 1524802 ***Flowing (Y/N):***

Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 69470
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 24-Sep-1990 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046549
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 23-Aug-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931059151
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 6.0
Formation End Depth: 8.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059152
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:

Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 8.0
Formation End Depth: 245.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059150
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 6.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110962
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961524802
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10595119
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081502
Layer: 1
Material:
Open Hole or Material:
Depth From:
Depth To: 41.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991524802

Pump Set At:
Static Level: 100.0
Final Level After Pumping: 215.0
Recommended Pump Depth: 230.0
Pumping Rate: 10.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934655173
Test Type: Draw Down
Test Duration: 45
Test Level: 215.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903549
Test Type: Draw Down
Test Duration: 60
Test Level: 215.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934109985
Test Type: Draw Down
Test Duration: 15
Test Level: 150.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934385394
Test Type: Draw Down
Test Duration: 30
Test Level: 190.0
Test Level UOM: ft

Water Details

Water ID: 933483556
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 242.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database: ***WWIS***

Well ID: 1524801
Construction Date:
Use 1st: Domestic
Use 2nd:
Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1

Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 69471
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Date Received: 24-Sep-1990 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046548
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 29-Aug-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931059148
Layer: 3
Color: 8
General Color: BLACK
Mat1: 14
Most Common Material: HARDPAN
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 24.0
Formation End Depth: 40.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059147
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:

Formation Top Depth: 12.0
Formation End Depth: 24.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059149
Layer: 4
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 40.0
Formation End Depth: 50.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931059146
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110961
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961524801
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10595118
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081501
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 44.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 991524801
Pump Set At:
Static Level: 8.0
Final Level After Pumping: 40.0
Recommended Pump Depth: 40.0
Pumping Rate: 15.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR:
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934903548
Test Type:
Test Duration: 60
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655172
Test Type:
Test Duration: 45
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934109984
Test Type:
Test Duration: 15
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934385393
Test Type:
Test Duration: 30
Test Level: 35.0
Test Level UOM: ft

Water Details

Water ID:	933483555
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	48.0
Water Found Depth UOM:	ft

Site:
lot 3 ON

Database:
WWIS

Well ID:	1524660	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	06-Jul-1990 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	74608	***Contractor:***	3749
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10046408	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	18-Jun-1990 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931058673
Layer:	1
Color:	8
General Color:	BLACK
Mat1:	02
Most Common Material:	TOPSOIL
Mat2:	00
Mat2 Desc:	UNKNOWN TYPE
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	2.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID: 931058674
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2: 12
Mat2 Desc: STONES
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 2.0
Formation End Depth: 17.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931058675
Layer: 3
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2: 85
Mat2 Desc: SOFT
Mat3:
Mat3 Desc:
Formation Top Depth: 17.0
Formation End Depth: 185.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110878
Layer: 1
Plug From: 6.0
Plug To: 22.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961524660
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10594978
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081251
Layer: 1
Material: 1

Open Hole or Material: STEEL
Depth From:
Depth To: 22.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991524660
Pump Set At:
Static Level: 4.0
Final Level After Pumping: 105.0
Recommended Pump Depth: 170.0
Pumping Rate:
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934384847
Test Type: Draw Down
Test Duration: 30
Test Level: 72.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934109434
Test Type: Draw Down
Test Duration: 15
Test Level: 38.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934654625
Test Type: Draw Down
Test Duration: 45
Test Level: 105.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903005
Test Type: Draw Down
Test Duration: 60
Test Level: 105.0
Test Level UOM: ft

Water Details

Water ID: 933483356
Layer: 3
Kind Code: 1

Kind: FRESH
Water Found Depth: 170.0
Water Found Depth UOM: ft

Water Details

Water ID: 933483355
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 110.0
Water Found Depth UOM: ft

Water Details

Water ID: 933483354
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 86.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database: ***WWIS***

Well ID: 1524657
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 74616
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 20-Jul-1990 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046405
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 27-Jun-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931058668
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 5.0
Formation End Depth: 255.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931058667
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2: 01
Mat2 Desc: FILL
Mat3: 77
Mat3 Desc: LOOSE
Formation Top Depth: 0.0
Formation End Depth: 5.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110875
Layer: 1
Plug From: 7.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961524657
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10594975
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930081248
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:

Depth To: 40.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991524657
Pump Set At:
Static Level: 45.0
Final Level After Pumping: 160.0
Recommended Pump Depth: 245.0
Pumping Rate: 7.0
Flowing Rate:
Recommended Pump Rate: 6.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 15
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934109432
Test Type: Draw Down
Test Duration: 15
Test Level: 89.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934384845
Test Type: Draw Down
Test Duration: 30
Test Level: 140.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934654623
Test Type: Draw Down
Test Duration: 45
Test Level: 160.0
Test Level UOM: ft

Water Details

Water ID: 933483345
Layer: 4
Kind Code: 1
Kind: FRESH
Water Found Depth: 230.0
Water Found Depth UOM: ft

Water Details

Water ID: 933483344
Layer: 3
Kind Code: 1
Kind: FRESH

Water Found Depth: 210.0
Water Found Depth UOM: ft

Water Details

Water ID: 933483342
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 145.0
Water Found Depth UOM: ft

Water Details

Water ID: 933483343
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 180.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database: ***WWIS***

Well ID: 1524446
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 74611
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 11-May-1990 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10046196
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 04-Apr-1990 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock

Materials Interval

Formation ID:	931057947
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	01
Most Common Material:	FILL
Mat2:	12
Mat2 Desc:	STONES
Mat3:	77
Mat3 Desc:	LOOSE
Formation Top Depth:	0.0
Formation End Depth:	5.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931057948
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	5.0
Formation End Depth:	250.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933110741
Layer:	1
Plug From:	8.0
Plug To:	40.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961524446
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	10594766
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930080897
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	41.0

Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991524446
Pump Set At:
Static Level: 90.0
Final Level After Pumping: 160.0
Recommended Pump Depth: 240.0
Pumping Rate: 6.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934108826
Test Type:
Test Duration: 15
Test Level: 96.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934393053
Test Type:
Test Duration: 30
Test Level: 119.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934653601
Test Type:
Test Duration: 45
Test Level: 160.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934902402
Test Type:
Test Duration: 60
Test Level: 160.0
Test Level UOM: ft

Water Details

Water ID: 933483085
Layer: 4
Kind Code: 1
Kind: FRESH
Water Found Depth: 230.0
Water Found Depth UOM: ft

Water Details

Water ID:	933483084
Layer:	3
Kind Code:	1
Kind:	FRESH
Water Found Depth:	210.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933483082
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	160.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933483083
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	190.0
Water Found Depth UOM:	ft

Site:
lot 3 ON

Database:
WWIS

Well ID:	1524275	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	02-Feb-1990 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	68248	***Contractor:***	3749
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10046047	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	15-Nov-1989 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			

Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931057407
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 5.0
Formation End Depth: 265.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931057406
Layer: 1
Color: 6
General Color: BROWN
Mat1: 01
Most Common Material: FILL
Mat2: 05
Mat2 Desc: CLAY
Mat3: 12
Mat3 Desc: STONES
Formation Top Depth: 0.0
Formation End Depth: 5.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110647
Layer: 1
Plug From: 16.0
Plug To: 44.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961524275
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10594617
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID:	930080640
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	44.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991524275
Pump Set At:	
Static Level:	155.0
Final Level After Pumping:	195.0
Recommended Pump Depth:	260.0
Pumping Rate:	7.0
Flowing Rate:	
Recommended Pump Rate:	7.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	1
Water State After Test:	CLEAR
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	30
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934108271
Test Type:	Draw Down
Test Duration:	15
Test Level:	195.0
Test Level UOM:	ft

Water Details

Water ID:	933482862
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	165.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933482864
Layer:	3
Kind Code:	1
Kind:	FRESH
Water Found Depth:	260.0
Water Found Depth UOM:	ft

Water Details

Water ID:	933482863
Layer:	2
Kind Code:	1
Kind:	FRESH
Water Found Depth:	210.0

Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID:	1523769	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	08-Jun-1984 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:		***Contractor:***	1517
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	002
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10045543	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	01-May-1984 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931055654
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	15.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931055657

Layer: 4
Color: 8
General Color: BLACK
Mat1: 26
Most Common Material: ROCK
Mat2: 15
Mat2 Desc: LIMESTONE
Mat3:
Mat3 Desc:
Formation Top Depth: 78.0
Formation End Depth: 95.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931055655
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 15.0
Formation End Depth: 38.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931055656
Layer: 3
Color: 6
General Color: BROWN
Mat1: 11
Most Common Material: GRAVEL
Mat2: 28
Mat2 Desc: SAND
Mat3:
Mat3 Desc:
Formation Top Depth: 38.0
Formation End Depth: 78.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110419
Layer: 1
Plug From: 0.0
Plug To: 24.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961523769
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10594113
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930079705
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 78.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991523769
Pump Set At:
Static Level: 27.0
Final Level After Pumping: 80.0
Recommended Pump Depth:
Pumping Rate: 3.0
Flowing Rate:
Recommended Pump Rate:
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934651328
Test Type:
Test Duration: 45
Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934908534
Test Type:
Test Duration: 60
Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934390773
Test Type:
Test Duration: 30
Test Level: 80.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934106125
Test Type:
Test Duration: 15
Test Level: 80.0
Test Level UOM: ft

Water Details

Water ID: 933482163
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 92.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1523768
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 08-Jun-1984 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10045542
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 01-May-1984 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931055650
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28

Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 10.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931055652
Layer: 3
Color: 6
General Color: BROWN
Mat1: 11
Most Common Material: GRAVEL
Mat2: 28
Mat2 Desc: SAND
Mat3:
Mat3 Desc:
Formation Top Depth: 28.0
Formation End Depth: 89.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931055651
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 10.0
Formation End Depth: 28.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931055653
Layer: 4
Color: 8
General Color: BLACK
Mat1: 26
Most Common Material: ROCK
Mat2: 15
Mat2 Desc: LIMESTONE
Mat3:
Mat3 Desc:
Formation Top Depth: 89.0
Formation End Depth: 90.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110418
Layer: 1

Plug From: 0.0
Plug To: 23.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961523768
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10594112
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930079704
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 81.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991523768
Pump Set At:
Static Level: 25.0
Final Level After Pumping: 65.0
Recommended Pump Depth:
Pumping Rate: 8.0
Flowing Rate:
Recommended Pump Rate:
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 15
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934390772
Test Type:
Test Duration: 30
Test Level: 65.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934106124
Test Type:
Test Duration: 15

Test Level: 65.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934651327
Test Type:
Test Duration: 45
Test Level: 65.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934908533
Test Type:
Test Duration: 60
Test Level: 65.0
Test Level UOM: ft

Water Details

Water ID: 933482162
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 88.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1523280
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: NA
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 23-Mar-1989 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10045055
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 02-Dec-1988 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931054045
Layer: 4
Color: 8
General Color: BLACK
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 49.0
Formation End Depth: 62.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931054044
Layer: 3
Color: 8
General Color: BLACK
Mat1: 28
Most Common Material: SAND
Mat2: 11
Mat2 Desc: GRAVEL
Mat3:
Mat3 Desc:
Formation Top Depth: 30.0
Formation End Depth: 49.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931054043
Layer: 2
Color: 2
General Color: GREY
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 10.0
Formation End Depth: 30.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931054042
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05

Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 10.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110206
Layer: 1
Plug From: 2.0
Plug To: 22.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961523280
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10593625
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930078819
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 49.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991523280
Pump Set At:
Static Level: 2.0
Final Level After Pumping: 48.0
Recommended Pump Depth: 55.0
Pumping Rate: 8.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934649617
Test Type:
Test Duration: 45
Test Level: 45.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934388634
Test Type:
Test Duration: 30
Test Level: 38.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934906818
Test Type:
Test Duration: 60
Test Level: 48.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934104402
Test Type:
Test Duration: 15
Test Level: 30.0
Test Level UOM: ft

Water Details

Water ID: 933481464
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 60.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1523093
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 27149
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: GLOUCESTER TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 24-Jan-1989 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3644
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	10044899	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	28-Oct-1988 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931053533
Layer:	3
Color:	1
General Color:	WHITE
Mat1:	18
Most Common Material:	SANDSTONE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	80.0
Formation End Depth:	103.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931053532
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	21.0
Formation End Depth:	80.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931053531
Layer:	1
Color:	2
General Color:	GREY
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Mat2 Desc:	

Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 21.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961523093
Method Construction Code: 5
Method Construction: Air Percussion
Other Method Construction:

Pipe Information

Pipe ID: 10593469
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930078540
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 25.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Construction Record - Casing

Casing ID: 930078541
Layer: 2
Material: 4
Open Hole or Material: OPEN HOLE
Depth From:
Depth To: 103.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: PUMP
Pump Test ID: 991523093
Pump Set At:
Static Level: 10.0
Final Level After Pumping: 30.0
Recommended Pump Depth: 30.0
Pumping Rate: 30.0
Flowing Rate:
Recommended Pump Rate: 15.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 1
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934649067
Test Type:
Test Duration: 45
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934112667
Test Type:
Test Duration: 15
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934906271
Test Type:
Test Duration: 60
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934388085
Test Type:
Test Duration: 30
Test Level: 30.0
Test Level UOM: ft

Water Details

Water ID: 933481226
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 97.0
Water Found Depth UOM: ft

Water Details

Water ID: 933481225
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 50.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1523047
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 44188
Tag:
Constructn Method:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 13-Dec-1988 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:

Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10044853
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 15-Nov-1988 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931053346
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 6.0
Formation End Depth: 58.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931053345
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2: 05
Mat2 Desc: CLAY
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 6.0
Formation End Depth UOM: ft

Overburden and Bedrock

Materials Interval

Formation ID:	931053348
Layer:	4
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	70.0
Formation End Depth:	275.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931053347
Layer:	3
Color:	8
General Color:	BLACK
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	58.0
Formation End Depth:	70.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933110082
Layer:	1
Plug From:	2.0
Plug To:	44.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961523047
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	10593423
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930078466
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	44.0

Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991523047
Pump Set At:
Static Level: 80.0
Final Level After Pumping: 125.0
Recommended Pump Depth: 200.0
Pumping Rate: 15.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code:
Water State After Test:
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934906230
Test Type:
Test Duration: 60
Test Level: 125.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934112622
Test Type:
Test Duration: 15
Test Level: 100.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934388043
Test Type:
Test Duration: 30
Test Level: 120.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934649025
Test Type:
Test Duration: 45
Test Level: 125.0
Test Level UOM: ft

Water Details

Water ID: 933481151
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 274.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID:	1523045	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	13-Dec-1988 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	37560	***Contractor:***	2351
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10044851	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	14-Nov-1988 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931053340
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	14
Most Common Material:	HARDPAN
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	17.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931053342
Layer:	3

Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 189.0
Formation End Depth: 207.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931053341
Layer: 2
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 17.0
Formation End Depth: 189.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110080
Layer: 1
Plug From: 3.0
Plug To: 44.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961523045
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10593421
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930078464
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 44.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991523045
Pump Set At:	
Static Level:	123.0
Final Level After Pumping:	162.0
Recommended Pump Depth:	200.0
Pumping Rate:	14.0
Flowing Rate:	
Recommended Pump Rate:	5.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	20
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934906229
Test Type:	Draw Down
Test Duration:	60
Test Level:	162.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934388041
Test Type:	Draw Down
Test Duration:	30
Test Level:	162.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934112620
Test Type:	Draw Down
Test Duration:	15
Test Level:	156.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934649023
Test Type:	Draw Down
Test Duration:	45
Test Level:	162.0
Test Level UOM:	ft

Water Details

Water ID:	933481149
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	201.0
Water Found Depth UOM:	ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1523044
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 37571
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 13-Dec-1988 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10044850
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 24-Nov-1988 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931053339
Layer: 2
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 18.0
Formation End Depth: 107.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931053338
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14

Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 18.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933110079
Layer: 1
Plug From: 4.0
Plug To: 18.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961523044
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10593420
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930078463
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 18.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991523044
Pump Set At:
Static Level: 12.0
Final Level After Pumping: 102.0
Recommended Pump Depth: 104.0
Pumping Rate: 2.0
Flowing Rate:
Recommended Pump Rate: 1.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR:
Pumping Duration MIN:
Flowing: No

Draw Down & Recovery

Pump Test Detail ID:	934112619
Test Type:	Draw Down
Test Duration:	15
Test Level:	75.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934906228
Test Type:	Draw Down
Test Duration:	60
Test Level:	102.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934388040
Test Type:	Draw Down
Test Duration:	30
Test Level:	102.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934649022
Test Type:	Draw Down
Test Duration:	45
Test Level:	102.0
Test Level UOM:	ft

Water Details

Water ID:	933481148
Layer:	1
Kind Code:	3
Kind:	SULPHUR
Water Found Depth:	25.0
Water Found Depth UOM:	ft

Site:
lot 1 ON

Database:
WWIS

Well ID:	1523042	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	22-Dec-1988 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	37572	***Contractor:***	2351
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10044848	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	01-Dec-1988 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931053332
Layer:	2
Color:	8
General Color:	BLACK
Mat1:	17
Most Common Material:	SHALE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	20.0
Formation End Depth:	88.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931053331
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	14
Most Common Material:	HARDPAN
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	20.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933110077
Layer:	1
Plug From:	6.0
Plug To:	20.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID: 961523042
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10593418
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930078461
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 20.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991523042
Pump Set At:
Static Level: 17.0
Final Level After Pumping: 75.0
Recommended Pump Depth: 82.0
Pumping Rate: 2.0
Flowing Rate:
Recommended Pump Rate: 1.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 20
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934649020
Test Type: Draw Down
Test Duration: 45
Test Level: 75.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934906226
Test Type: Draw Down
Test Duration: 60
Test Level: 75.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934388038

Test Type: Draw Down
Test Duration: 30
Test Level: 70.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934112617
Test Type: Draw Down
Test Duration: 15
Test Level: 65.0
Test Level UOM: ft

Water Details

Water ID: 933481146
Layer: 1
Kind Code: 3
Kind: SULPHUR
Water Found Depth: 24.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database: ***WWIS***

Well ID: 1522674
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 13180
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 07-Oct-1988 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10044484
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 15-Sep-1988 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931052242
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 16.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931052243
Layer: 2
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 16.0
Formation End Depth: 50.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933109987
Layer: 1
Plug From: 0.0
Plug To: 22.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961522674
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10593054
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930077798
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:

Depth To: 22.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991522674
Pump Set At:
Static Level: 8.0
Final Level After Pumping: 42.0
Recommended Pump Depth: 46.0
Pumping Rate: 3.0
Flowing Rate:
Recommended Pump Rate: 3.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934905041
Test Type:
Test Duration: 60
Test Level: 42.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934111004
Test Type:
Test Duration: 15
Test Level: 28.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386429
Test Type:
Test Duration: 30
Test Level: 35.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934656224
Test Type:
Test Duration: 45
Test Level: 42.0
Test Level UOM: ft

Water Details

Water ID: 933480647
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 41.0

Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID:	1522670	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	28-Oct-1988 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	NA	***Contractor:***	1517
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	001
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10044480	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	29-Sep-1988 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931052229
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	01
Most Common Material:	FILL
Mat2:	12
Mat2 Desc:	STONES
Mat3:	05
Mat3 Desc:	CLAY
Formation Top Depth:	0.0
Formation End Depth:	6.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931052230

Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 6.0
Formation End Depth: 270.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933109986
Layer: 1
Plug From: 2.0
Plug To: 44.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961522670
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10593050
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930077794
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 44.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991522670
Pump Set At:
Static Level: 110.0
Final Level After Pumping: 230.0
Recommended Pump Depth: 250.0
Pumping Rate: 10.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2

Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934904617
Test Type:
Test Duration: 60
Test Level: 230.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934386425
Test Type:
Test Duration: 30
Test Level: 180.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934656220
Test Type:
Test Duration: 45
Test Level: 200.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934111000
Test Type:
Test Duration: 15
Test Level: 160.0
Test Level UOM: ft

Water Details

Water ID: 933480643
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 268.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1522419
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 13751
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 04-Jul-1988 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:

Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10044231
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 31-May-1988 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931051370
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 6.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931051371
Layer: 2
Color: 2
General Color: GREY
Mat1: 14
Most Common Material: HARDPAN
Mat2: 05
Mat2 Desc: CLAY
Mat3:
Mat3 Desc:
Formation Top Depth: 6.0
Formation End Depth: 10.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931051372
Layer: 3
Color: 2
General Color: GREY

Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 10.0
Formation End Depth: 84.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933109885
Layer: 1
Plug From: 0.0
Plug To: 24.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961522419
Method Construction Code: 4
Method Construction: Rotary (Air)
Other Method Construction:

Pipe Information

Pipe ID: 10592801
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930077359
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 24.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991522419
Pump Set At:
Static Level: 16.0
Final Level After Pumping: 65.0
Recommended Pump Depth: 75.0
Pumping Rate: 20.0
Flowing Rate:
Recommended Pump Rate: 15.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934385208
Test Type:
Test Duration: 30
Test Level: 50.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655151
Test Type:
Test Duration: 45
Test Level: 60.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934109923
Test Type:
Test Duration: 15
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903978
Test Type:
Test Duration: 60
Test Level: 65.0
Test Level UOM: ft

Water Details

Water ID: 933480310
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 82.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1522416
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 25146
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 06-Jul-1988 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Site Info:

Bore Hole Information

Bore Hole ID:	10044228	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	09-Jun-1988 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931051364
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	12
Mat2 Desc:	STONES
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	16.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931051365
Layer:	2
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	80
Mat2 Desc:	POROUS
Mat3:	73
Mat3 Desc:	HARD
Formation Top Depth:	16.0
Formation End Depth:	124.0
Formation End Depth UOM:	ft

Annular Space/Abandonment Sealing Record

Plug ID:	933109882
Layer:	1
Plug From:	0.0
Plug To:	40.0
Plug Depth UOM:	ft

Method of Construction & Well

Use

Method Construction ID: 961522416
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10592798
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930077354
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 40.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991522416
Pump Set At:
Static Level: 23.0
Final Level After Pumping: 23.0
Recommended Pump Depth: 14.0
Pumping Rate: 14.0
Flowing Rate:
Recommended Pump Rate: 100.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 15
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934385205
Test Type: Draw Down
Test Duration: 30
Test Level: 21.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655148
Test Type: Draw Down
Test Duration: 45
Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903975
Test Type: Draw Down
Test Duration: 60
Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934109920
Test Type: Draw Down
Test Duration: 15
Test Level: 19.0
Test Level UOM: ft

Water Details

Water ID: 933480303
Layer: 3
Kind Code: 1
Kind: FRESH
Water Found Depth: 122.0
Water Found Depth UOM: ft

Water Details

Water ID: 933480302
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 108.0
Water Found Depth UOM: ft

Water Details

Water ID: 933480301
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 96.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1522320
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 26021
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 02-Jun-1988 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	10044132	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	16-May-1988 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931050949
Layer:	4
Color:	8
General Color:	BLACK
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	31
Mat2 Desc:	COARSE GRAVEL
Mat3:	
Mat3 Desc:	
Formation Top Depth:	58.0
Formation End Depth:	61.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931050946
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	28
Most Common Material:	SAND
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	6.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931050947
Layer:	2
Color:	3
General Color:	BLUE
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Mat2 Desc:	
Mat3:	

Mat3 Desc:
Formation Top Depth: 6.0
Formation End Depth: 29.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931050948
Layer: 3
Color: 8
General Color: BLACK
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 29.0
Formation End Depth: 58.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961522320
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10592702
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930077190
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 61.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991522320
Pump Set At:
Static Level: 19.0
Final Level After Pumping: 51.0
Recommended Pump Depth: 56.0
Pumping Rate: 22.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2

Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934109846
Test Type: Draw Down
Test Duration: 15
Test Level: 45.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903489
Test Type: Draw Down
Test Duration: 60
Test Level: 51.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934385829
Test Type: Draw Down
Test Duration: 30
Test Level: 51.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655078
Test Type: Draw Down
Test Duration: 45
Test Level: 51.0
Test Level UOM: ft

Water Details

Water ID: 933480161
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 61.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1522274
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: NA
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 12-May-1988 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 3749
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:

Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10044087
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 28-Nov-1987 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:
Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931050780
Layer: 2
Color: 6
General Color: BROWN
Mat1: 11
Most Common Material: GRAVEL
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 1.0
Formation End Depth: 7.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931050781
Layer: 3
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 73
Mat2 Desc: HARD
Mat3:
Mat3 Desc:
Formation Top Depth: 7.0
Formation End Depth: 252.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931050779
Layer: 1
Color: 6
General Color: BROWN

Mat1: 02
Most Common Material: TOPSOIL
Mat2: 12
Mat2 Desc: STONES
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 1.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933109784
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961522274
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10592657
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930077109
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 40.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991522274
Pump Set At:
Static Level: 29.0
Final Level After Pumping: 38.0
Recommended Pump Depth: 240.0
Pumping Rate: 10.0
Flowing Rate:
Recommended Pump Rate: 8.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 1
Water State After Test: CLEAR
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 30
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934385785
Test Type:
Test Duration: 30
Test Level: 36.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934903449
Test Type:
Test Duration: 60
Test Level: 38.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934109802
Test Type:
Test Duration: 15
Test Level: 29.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934655034
Test Type:
Test Duration: 45
Test Level: 38.0
Test Level UOM: ft

Water Details

Water ID: 933480100
Layer: 2
Kind Code: 1
Kind: FRESH
Water Found Depth: 205.0
Water Found Depth UOM: ft

Water Details

Water ID: 933480101
Layer: 3
Kind Code: 1
Kind: FRESH
Water Found Depth: 245.0
Water Found Depth UOM: ft

Water Details

Water ID: 933480099
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 140.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1521833
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 13797
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 07-Oct-1987 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10043646
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 21-Sep-1987 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931049308
Layer: 2
Color: 2
General Color: GREY
Mat1: 15
Most Common Material: LIMESTONE
Mat2: 26
Mat2 Desc: ROCK
Mat3:
Mat3 Desc:
Formation Top Depth: 12.0
Formation End Depth: 50.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931049307
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14

Most Common Material: HARDPAN
Mat2: 05
Mat2 Desc: CLAY
Mat3: 12
Mat3 Desc: STONES
Formation Top Depth: 0.0
Formation End Depth: 12.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933109614
Layer: 1
Plug From: 0.0
Plug To: 22.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961521833
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10592216
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930076264
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 22.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc:
Pump Test ID: 991521833
Pump Set At:
Static Level: 7.0
Final Level After Pumping: 32.0
Recommended Pump Depth: 42.0
Pumping Rate: 6.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code:
Water State After Test:
Pumping Test Method:
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934391251
Test Type:
Test Duration: 30
Test Level: 28.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934108127
Test Type:
Test Duration: 15
Test Level: 25.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934653370
Test Type:
Test Duration: 45
Test Level: 30.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934910601
Test Type:
Test Duration: 60
Test Level: 32.0
Test Level UOM: ft

Water Details

Water ID: 933479538
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 48.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1521566
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 05908
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 10-Aug-1987 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 1517
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID:	10043388	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	02-Jun-1987 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931048501
Layer:	5
Color:	2
General Color:	GREY
Mat1:	15
Most Common Material:	LIMESTONE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	78.0
Formation End Depth:	90.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931048500
Layer:	4
Color:	2
General Color:	GREY
Mat1:	11
Most Common Material:	GRAVEL
Mat2:	28
Mat2 Desc:	SAND
Mat3:	
Mat3 Desc:	
Formation Top Depth:	70.0
Formation End Depth:	78.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931048498
Layer:	2
Color:	3
General Color:	BLUE
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Mat2 Desc:	

Mat3:
Mat3 Desc:
Formation Top Depth: 15.0
Formation End Depth: 45.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931048497
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 15.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931048499
Layer: 3
Color: 2
General Color: GREY
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 45.0
Formation End Depth: 70.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933109523
Layer: 1
Plug From: 0.0
Plug To: 30.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961521566
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591958
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID:	930075794
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	78.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	
Pump Test ID:	991521566
Pump Set At:	
Static Level:	15.0
Final Level After Pumping:	15.0
Recommended Pump Depth:	40.0
Pumping Rate:	20.0
Flowing Rate:	
Recommended Pump Rate:	10.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	
Water State After Test:	
Pumping Test Method:	
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934652284
Test Type:	
Test Duration:	45
Test Level:	20.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934908956
Test Type:	
Test Duration:	60
Test Level:	20.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934107041
Test Type:	
Test Duration:	15
Test Level:	15.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934390723
Test Type:	
Test Duration:	30
Test Level:	15.0
Test Level UOM:	ft

Water Details

Water ID:	933479187
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	88.0
Water Found Depth UOM:	ft

Site:
lot 2 ON

Database:
WWIS

Well ID:	1521459	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	13-Jul-1987 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	12550	***Contractor:***	2351
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	002
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10043281	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	16-Jun-1987 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931048125
Layer:	2
Color:	3
General Color:	BLUE
Mat1:	17
Most Common Material:	SHALE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	18.0

Formation End Depth: 45.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931048124
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 18.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961521459
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591851
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930075580
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 18.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991521459
Pump Set At:
Static Level: 6.0
Final Level After Pumping: 40.0
Recommended Pump Depth: 37.0
Pumping Rate: 3.0
Flowing Rate:
Recommended Pump Rate: 3.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0

Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934106525
Test Type: Draw Down
Test Duration: 15
Test Level: 28.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934651769
Test Type: Draw Down
Test Duration: 45
Test Level: 40.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934390204
Test Type: Draw Down
Test Duration: 30
Test Level: 39.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934908860
Test Type: Draw Down
Test Duration: 60
Test Level: 40.0
Test Level UOM: ft

Water Details

Water ID: 933479033
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 37.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database: ***WWIS***

Well ID: 1521453
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 12525
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 13-Jul-1997 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Municipality: CUMBERLAND TOWNSHIP
Site Info:

Bore Hole Information

Bore Hole ID: 10043275
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 13-Jun-1987 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931048109
Layer: 2
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 18.0
Formation End Depth: 50.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931048108
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 18.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961521453
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591845
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930075574
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 18.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991521453
Pump Set At:
Static Level: 7.0
Final Level After Pumping: 38.0
Recommended Pump Depth: 46.0
Pumping Rate: 10.0
Flowing Rate:
Recommended Pump Rate: 8.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934390198
Test Type: Draw Down
Test Duration: 30
Test Level: 38.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934908854
Test Type: Draw Down
Test Duration: 60
Test Level: 38.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934106519
Test Type: Draw Down
Test Duration: 15
Test Level: 27.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934651763
Test Type: Draw Down
Test Duration: 45
Test Level: 38.0
Test Level UOM: ft

Water Details

Water ID: 933479027
Layer: 1
Kind Code: 3
Kind: SULPHUR
Water Found Depth: 48.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1521451
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: 12523
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 13-Jul-1987 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10043273
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 25-May-1987 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931048102
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14

Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 4.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931048103
Layer: 2
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 4.0
Formation End Depth: 101.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931048104
Layer: 3
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 101.0
Formation End Depth: 107.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933109469
Layer: 1
Plug From: 0.0
Plug To: 40.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961521451
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591843
Casing No: 1
Comment:

Alt Name:

Construction Record - Casing

Casing ID:	930075572
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	40.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991521451
Pump Set At:	
Static Level:	28.0
Final Level After Pumping:	98.0
Recommended Pump Depth:	104.0
Pumping Rate:	6.0
Flowing Rate:	
Recommended Pump Rate:	4.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	15
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934106517
Test Type:	Draw Down
Test Duration:	15
Test Level:	35.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934390196
Test Type:	Draw Down
Test Duration:	30
Test Level:	47.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934651761
Test Type:	Draw Down
Test Duration:	45
Test Level:	95.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934908852
Test Type:	Draw Down
Test Duration:	60
Test Level:	98.0

Test Level UOM: ft

Water Details

Water ID: 933479025
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 103.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database: ***WWIS***

Well ID: 1520893
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: NA
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 22-Oct-1986 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10042734
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 08-Oct-1986 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931046183
Layer: 3
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:

Mat3 Desc:
Formation Top Depth: 18.0
Formation End Depth: 68.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931046182
Layer: 2
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 2.0
Formation End Depth: 18.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931046181
Layer: 1
Color: 6
General Color: BROWN
Mat1: 02
Most Common Material: TOPSOIL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 2.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961520893
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591304
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930074612
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 18.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991520893
Pump Set At:	
Static Level:	7.0
Final Level After Pumping:	60.0
Recommended Pump Depth:	66.0
Pumping Rate:	3.0
Flowing Rate:	
Recommended Pump Rate:	2.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	0
Pumping Duration MIN:	30
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934388463
Test Type:	Draw Down
Test Duration:	30
Test Level:	60.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934906702
Test Type:	Draw Down
Test Duration:	60
Test Level:	60.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934104225
Test Type:	Draw Down
Test Duration:	15
Test Level:	55.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934650039
Test Type:	Draw Down
Test Duration:	45
Test Level:	60.0
Test Level UOM:	ft

Water Details

Water ID:	933478295
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	25.0
Water Found Depth UOM:	ft

Site: ***Database:*** ***WWIS***

lot 2 ON

Well ID:	1520782	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	25-Sep-1986 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:	NA	***Contractor:***	2351
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	002
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10042623	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	30-Jul-1986 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931045801
Layer:	2
Color:	3
General Color:	BLUE
Mat1:	05
Most Common Material:	CLAY
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	9.0
Formation End Depth:	87.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931045802
Layer:	3
Color:	8
General Color:	BLACK

Mat1: 31
Most Common Material: COARSE GRAVEL
Mat2: 10
Mat2 Desc: COARSE SAND
Mat3:
Mat3 Desc:
Formation Top Depth: 87.0
Formation End Depth: 93.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045803
Layer: 4
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 93.0
Formation End Depth: 135.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045800
Layer: 1
Color: 6
General Color: BROWN
Mat1: 02
Most Common Material: TOPSOIL
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 9.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961520782
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591193
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930074383
Layer: 1
Material: 1
Open Hole or Material: STEEL

Depth From:
Depth To: 93.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991520782
Pump Set At:
Static Level: 67.0
Final Level After Pumping: 120.0
Recommended Pump Depth: 132.0
Pumping Rate: 4.0
Flowing Rate:
Recommended Pump Rate: 3.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 10
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934387945
Test Type: Draw Down
Test Duration: 30
Test Level: 110.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934906601
Test Type: Draw Down
Test Duration: 60
Test Level: 120.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934649521
Test Type: Draw Down
Test Duration: 45
Test Level: 120.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934104825
Test Type: Draw Down
Test Duration: 15
Test Level: 95.0
Test Level UOM: ft

Water Details

Water ID: 933478127
Layer: 1
Kind Code: 1
Kind: FRESH

Water Found Depth: 127.0
Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID: 1520778
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: NA
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 25-Sep-1986 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 003
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10042619
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 22-Jan-1986 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931045789
Layer: 3
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 191.0
Formation End Depth: 207.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045788
Layer: 2
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 4.0
Formation End Depth: 191.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045787
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 4.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961520778
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591189
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930074379
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 42.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991520778
Pump Set At:
Static Level: 65.0
Final Level After Pumping: 170.0

Recommended Pump Depth: 200.0
Pumping Rate: 5.0
Flowing Rate:
Recommended Pump Rate: 5.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934387941
Test Type: Draw Down
Test Duration: 30
Test Level: 170.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934649517
Test Type: Draw Down
Test Duration: 45
Test Level: 170.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934906597
Test Type: Draw Down
Test Duration: 60
Test Level: 170.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934104821
Test Type: Draw Down
Test Duration: 15
Test Level: 155.0
Test Level UOM: ft

Water Details

Water ID: 933478123
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 165.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1520772
Construction Date:
Use 1st: Domestic
Use 2nd: Cooling And A/C
Final Well Status: Water Supply
Water Type:
Casing Material:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 25-Sep-1986 00:00:00
Selected Flag: TRUE
Abandonment Rec:

Audit No:	NA	***Contractor:***	2351
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	002
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10042613	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	26-Aug-1986 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931045770
Layer:	1
Color:	6
General Color:	BROWN
Mat1:	14
Most Common Material:	HARDPAN
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	0.0
Formation End Depth:	19.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931045771
Layer:	2
Color:	3
General Color:	BLUE
Mat1:	17
Most Common Material:	SHALE
Mat2:	
Mat2 Desc:	
Mat3:	
Mat3 Desc:	
Formation Top Depth:	19.0
Formation End Depth:	45.0
Formation End Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID: 961520772
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591183
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930074373
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 19.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991520772
Pump Set At:
Static Level: 9.0
Final Level After Pumping: 36.0
Recommended Pump Depth: 42.0
Pumping Rate: 17.0
Flowing Rate:
Recommended Pump Rate: 12.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 10
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934104815
Test Type: Draw Down
Test Duration: 15
Test Level: 23.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934387935
Test Type: Draw Down
Test Duration: 30
Test Level: 36.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934906591
Test Type: Draw Down
Test Duration: 60
Test Level: 36.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934649511
Test Type: Draw Down
Test Duration: 45
Test Level: 36.0
Test Level UOM: ft

Water Details

Water ID: 933478117
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 44.0
Water Found Depth UOM: ft

Site:
lot 2 ON

Database: ***WWIS***

Well ID: 1520771
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: NA
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 25-Sep-1986 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10042612
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 26-Aug-1986 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Source Revision Comment:
Supplier Comment:

Overburden and Bedrock Materials Interval

Formation ID: 931045768
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 20.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045769
Layer: 2
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 20.0
Formation End Depth: 27.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961520771
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10591182
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930074372
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 20.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991520771
Pump Set At:	
Static Level:	8.0
Final Level After Pumping:	22.0
Recommended Pump Depth:	24.0
Pumping Rate:	6.0
Flowing Rate:	
Recommended Pump Rate:	5.0
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	25
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934649510
Test Type:	Draw Down
Test Duration:	45
Test Level:	22.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934387934
Test Type:	Draw Down
Test Duration:	30
Test Level:	22.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934104814
Test Type:	Draw Down
Test Duration:	15
Test Level:	19.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID:	934906590
Test Type:	Draw Down
Test Duration:	60
Test Level:	22.0
Test Level UOM:	ft

Water Details

Water ID:	933478116
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	26.0
Water Found Depth UOM:	ft

Site:
lot 2 ON

Database:
WWIS

Well ID: 1520567
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No: NA
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 15-Jul-1986 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 002
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10042409
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 06-Jun-1986 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931045161
Layer: 1
Color: 5
General Color: YELLOW
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 9.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045164
Layer: 4
Color: 8
General Color: BLACK
Mat1: 11
Most Common Material: GRAVEL

Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 53.0
Formation End Depth: 62.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045165
Layer: 5
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 62.0
Formation End Depth: 70.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045162
Layer: 2
Color: 7
General Color: RED
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 9.0
Formation End Depth: 19.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931045163
Layer: 3
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 19.0
Formation End Depth: 53.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961520567
Method Construction Code: 1
Method Construction: Cable Tool

Other Method Construction:

Pipe Information

Pipe ID: 10590979
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930074020
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 63.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991520567
Pump Set At:
Static Level: 30.0
Final Level After Pumping: 58.0
Recommended Pump Depth: 63.0
Pumping Rate: 10.0
Flowing Rate:
Recommended Pump Rate: 8.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934112460
Test Type: Draw Down
Test Duration: 15
Test Level: 45.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934387323
Test Type: Draw Down
Test Duration: 30
Test Level: 58.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934648346
Test Type: Draw Down
Test Duration: 45
Test Level: 58.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID:	934906128
Test Type:	Draw Down
Test Duration:	60
Test Level:	58.0
Test Level UOM:	ft

Water Details

Water ID:	933477846
Layer:	1
Kind Code:	1
Kind:	FRESH
Water Found Depth:	68.0
Water Found Depth UOM:	ft

Site:
lot 2 ON

Database:
WWIS

Well ID:	1520204	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	04-Dec-1985 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:		***Contractor:***	2351
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	002
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10042049	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	27-Oct-1985 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931044057

Layer: 3
Color: 8
General Color: BLACK
Mat1: 11
Most Common Material: GRAVEL
Mat2: 28
Mat2 Desc: SAND
Mat3:
Mat3 Desc:
Formation Top Depth: 228.0
Formation End Depth: 231.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931044056
Layer: 2
Color: 3
General Color: BLUE
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 19.0
Formation End Depth: 228.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931044055
Layer: 1
Color: 6
General Color: BROWN
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 19.0
Formation End Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961520204
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10590619
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930073387

Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:
Depth To: 231.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991520204
Pump Set At:
Static Level: 100.0
Final Level After Pumping: 130.0
Recommended Pump Depth: 150.0
Pumping Rate: 40.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 0
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934656008
Test Type:
Test Duration: 45
Test Level: 130.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934111434
Test Type:
Test Duration: 15
Test Level: 130.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934377254
Test Type:
Test Duration: 30
Test Level: 130.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934904977
Test Type:
Test Duration: 60
Test Level: 130.0
Test Level UOM: ft

Water Details

Water ID: 933477385

Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 231.0
Water Found Depth UOM: ft

Site:
lot 1 ON

Database:
WWIS

Well ID: 1519675
Construction Date:
Use 1st: Domestic
Use 2nd:
Final Well Status: Water Supply
Water Type:
Casing Material:
Audit No:
Tag:
Constructn Method:
Elevation (m):
Elevatn Reliabilty:
Depth to Bedrock:
Well Depth:
Overburden/Bedrock:
Pump Rate:
Static Water Level:
Clear/Cloudy:
Municipality: CUMBERLAND TOWNSHIP
Site Info:

Flowing (Y/N):
Flow Rate:
Data Entry Status:
Data Src: 1
Date Received: 21-Jun-1985 00:00:00
Selected Flag: TRUE
Abandonment Rec:
Contractor: 2351
Form Version: 1
Owner:
County: OTTAWA-CARLETON
Lot: 001
Concession:
Concession Name:
Easting NAD83:
Northing NAD83:
Zone:
UTM Reliability:

Bore Hole Information

Bore Hole ID: 10041528
DP2BR:
Spatial Status:
Code OB:
Code OB Desc:
Open Hole:
Cluster Kind:
Date Completed: 03-May-1985 00:00:00
Remarks:
Loc Method Desc: Not Applicable i.e. no UTM
Elevrc Desc:
Location Source Date:
Improvement Location Source:
Improvement Location Method:
Source Revision Comment:
Supplier Comment:

Elevation:
Elevrc:
Zone: 18
East83:
North83:
Org CS:
UTMRC: 9
UTMRC Desc: unknown UTM
Location Method: na

Overburden and Bedrock Materials Interval

Formation ID: 931042367
Layer: 3
Color: 8
General Color: BLACK
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 117.0
Formation End Depth: 162.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931042365
Layer: 1
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 13.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931042366
Layer: 2
Color: 3
General Color: BLUE
Mat1: 17
Most Common Material: SHALE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 13.0
Formation End Depth: 117.0
Formation End Depth UOM: ft

Annular Space/Abandonment Sealing Record

Plug ID: 933108880
Layer: 1
Plug From: 0.0
Plug To: 46.0
Plug Depth UOM: ft

Method of Construction & Well Use

Method Construction ID: 961519675
Method Construction Code: 1
Method Construction: Cable Tool
Other Method Construction:

Pipe Information

Pipe ID: 10590098
Casing No: 1
Comment:
Alt Name:

Construction Record - Casing

Casing ID: 930072515
Layer: 1
Material: 1
Open Hole or Material: STEEL
Depth From:

Depth To: 46.0
Casing Diameter: 6.0
Casing Diameter UOM: inch
Casing Depth UOM: ft

Results of Well Yield Testing

Pumping Test Method Desc: BAILER
Pump Test ID: 991519675
Pump Set At:
Static Level: 64.0
Final Level After Pumping: 119.0
Recommended Pump Depth: 156.0
Pumping Rate: 13.0
Flowing Rate:
Recommended Pump Rate: 10.0
Levels UOM: ft
Rate UOM: GPM
Water State After Test Code: 2
Water State After Test: CLOUDY
Pumping Test Method: 2
Pumping Duration HR: 1
Pumping Duration MIN: 10
Flowing: No

Draw Down & Recovery

Pump Test Detail ID: 934108587
Test Type: Draw Down
Test Duration: 15
Test Level: 87.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934653858
Test Type: Draw Down
Test Duration: 45
Test Level: 119.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934383878
Test Type: Draw Down
Test Duration: 30
Test Level: 91.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934894618
Test Type: Draw Down
Test Duration: 60
Test Level: 119.0
Test Level UOM: ft

Water Details

Water ID: 933476713
Layer: 1
Kind Code: 1
Kind: FRESH
Water Found Depth: 159.0

Water Found Depth UOM: ft

Site:
lot 3 ON

Database:
WWIS

Well ID:	1519223	***Flowing (Y/N):***	
Construction Date:		***Flow Rate:***	
Use 1st:	Domestic	***Data Entry Status:***	
Use 2nd:		***Data Src:***	1
Final Well Status:	Water Supply	***Date Received:***	11-Sep-1984 00:00:00
Water Type:		***Selected Flag:***	TRUE
Casing Material:		***Abandonment Rec:***	
Audit No:		***Contractor:***	1517
Tag:		***Form Version:***	1
Constructn Method:		***Owner:***	
Elevation (m):		***County:***	OTTAWA-CARLETON
Elevatn Reliabilty:		***Lot:***	003
Depth to Bedrock:		***Concession:***	
Well Depth:		***Concession Name:***	
Overburden/Bedrock:		***Easting NAD83:***	
Pump Rate:		***Northing NAD83:***	
Static Water Level:		***Zone:***	
Clear/Cloudy:		***UTM Reliability:***	
Municipality:	CUMBERLAND TOWNSHIP		
Site Info:			

Bore Hole Information

Bore Hole ID:	10041093	***Elevation:***	
DP2BR:		***Elevrc:***	
Spatial Status:		***Zone:***	18
Code OB:		***East83:***	
Code OB Desc:		***North83:***	
Open Hole:		***Org CS:***	
Cluster Kind:		***UTMRC:***	9
Date Completed:	14-Aug-1984 00:00:00	***UTMRC Desc:***	unknown UTM
Remarks:		***Location Method:***	na
Loc Method Desc:	Not Applicable i.e. no UTM		
Elevrc Desc:			
Location Source Date:			
Improvement Location Source:			
Improvement Location Method:			
Source Revision Comment:			
Supplier Comment:			

Overburden and Bedrock Materials Interval

Formation ID:	931041001
Layer:	4
Color:	2
General Color:	GREY
Mat1:	14
Most Common Material:	HARDPAN
Mat2:	11
Mat2 Desc:	GRAVEL
Mat3:	
Mat3 Desc:	
Formation Top Depth:	58.0
Formation End Depth:	80.0
Formation End Depth UOM:	ft

Overburden and Bedrock Materials Interval

Formation ID:	931041000

Layer: 3
Color: 6
General Color: BROWN
Mat1: 14
Most Common Material: HARDPAN
Mat2: 28
Mat2 Desc: SAND
Mat3:
Mat3 Desc:
Formation Top Depth: 26.0
Formation End Depth: 58.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931040998
Layer: 1
Color: 6
General Color: BROWN
Mat1: 28
Most Common Material: SAND
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 0.0
Formation End Depth: 15.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931041002
Layer: 5
Color: 8
General Color: BLACK
Mat1: 15
Most Common Material: LIMESTONE
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 80.0
Formation End Depth: 82.0
Formation End Depth UOM: ft

Overburden and Bedrock Materials Interval

Formation ID: 931040999
Layer: 2
Color: 7
General Color: RED
Mat1: 05
Most Common Material: CLAY
Mat2:
Mat2 Desc:
Mat3:
Mat3 Desc:
Formation Top Depth: 15.0
Formation End Depth: 26.0
Formation End Depth UOM: ft

Annular Space/Abandonment

Sealing Record

Plug ID:	933108848
Layer:	1
Plug From:	0.0
Plug To:	22.0
Plug Depth UOM:	ft

Method of Construction & Well Use

Method Construction ID:	961519223
Method Construction Code:	1
Method Construction:	Cable Tool
Other Method Construction:	

Pipe Information

Pipe ID:	10589663
Casing No:	1
Comment:	
Alt Name:	

Construction Record - Casing

Casing ID:	930071755
Layer:	1
Material:	1
Open Hole or Material:	STEEL
Depth From:	
Depth To:	80.0
Casing Diameter:	6.0
Casing Diameter UOM:	inch
Casing Depth UOM:	ft

Results of Well Yield Testing

Pumping Test Method Desc:	BAILER
Pump Test ID:	991519223
Pump Set At:	
Static Level:	30.0
Final Level After Pumping:	68.0
Recommended Pump Depth:	75.0
Pumping Rate:	15.0
Flowing Rate:	
Recommended Pump Rate:	
Levels UOM:	ft
Rate UOM:	GPM
Water State After Test Code:	2
Water State After Test:	CLOUDY
Pumping Test Method:	2
Pumping Duration HR:	1
Pumping Duration MIN:	0
Flowing:	No

Draw Down & Recovery

Pump Test Detail ID:	934652734
Test Type:	
Test Duration:	45
Test Level:	60.0
Test Level UOM:	ft

Draw Down & Recovery

Pump Test Detail ID: 934382201
Test Type:
Test Duration: 30
Test Level: 55.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934901702
Test Type:
Test Duration: 60
Test Level: 68.0
Test Level UOM: ft

Draw Down & Recovery

Pump Test Detail ID: 934107463
Test Type:
Test Duration: 15
Test Level: 50.0
Test Level UOM: ft

Water Details

Water ID: 933476144
Layer: 1
Kind Code: 3
Kind: SULPHUR
Water Found Depth: 81.0
Water Found Depth UOM: ft

Appendix: Database Descriptions

Environmental Risk Information Services (ERIS) can search the following databases. The extent of historical information varies with each database and current information is determined by what is publicly available to ERIS at the time of update. ***Note:*** *Databases denoted with " * " indicates that the database will no longer be updated. See the individual database description for more information.*

Abandoned Aggregate Inventory: Provincial AAGR

The MAAP Program maintains a database of abandoned pits and quarries. Please note that the database is only referenced by lot and concession and city/town location. The database provides information regarding the location, type, size, land use, status and general comments.*

Government Publication Date: Sept 2002*

Aggregate Inventory: Provincial AGR

The Ontario Ministry of Northern Development, Mines, Natural Resources and Forestry (ONDMNRF) maintains this database of pits and quarries. The database provides information regarding the registered owner/operator, location name, operation type, approval type, and maximum annual tonnage.

Government Publication Date: Up to Oct 2022

Abandoned Mine Information System: Provincial AMIS

The Abandoned Mines Information System contains data on known abandoned and inactive mines located on both Crown and privately held lands. The information was provided by the Ministry of Northern Development and Mines (MNDM), with the following disclaimer: "the database provided has been compiled from various sources, and the Ministry of Northern Development and Mines makes no representation and takes no responsibility that such information is accurate, current or complete". Reported information includes official mine name, status, background information, mine start/end date, primary commodity, mine features, hazards and remediation.

Government Publication Date: 1800-Mar 2022

Anderson's Waste Disposal Sites: Private ANDR

The information provided in this database was collected by examining various historical documents which aimed to characterize the likely position of former waste disposal sites from 1860 to present. The research initiative behind the creation of this database was to identify those sites that are missing from the Ontario MOE Waste Disposal Site Inventory, as well as to provide revisions and corrections to the positions and descriptions of sites currently listed in the MOE inventory. In addition to historic waste disposal facilities, the database also identifies certain auto wreckers and scrap yards that have been extrapolated from documentary sources. Please note that the data is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1860s-Present

Aboveground Storage Tanks: Provincial AST

Historical listing of aboveground storage tanks made available by the Department of Natural Resources and Forestry. Includes tanks used to hold water or petroleum. This dataset has been retired as of September 25, 2014 and will no longer be updated.

Government Publication Date: May 31, 2014

Automobile Wrecking & Supplies: Private AUWR

This database provides an inventory of known locations that are involved in the scrap metal, automobile wrecking/recycling, and automobile parts & supplies industry. Information is provided on the company name, location and business type.

Government Publication Date: 1999-Feb 28, 2022

Borehole: Provincial BORE

A borehole is the generalized term for any narrow shaft drilled in the ground, either vertically or horizontally. The information here includes geotechnical investigations or environmental site assessments, mineral exploration, or as a pilot hole for installing piers or underground utilities. Information is from many sources such as the Ministry of Transportation (MTO) boreholes from engineering reports and projects from the 1950 to 1990's in Southern Ontario. Boreholes from the Ontario Geological Survey (OGS) including The Urban Geology Analysis Information System (UGAIS) and the York Peel Durham Toronto (YPDT) database of the Conservation Authority Moraine Coalition. This database will include fields such as location, stratigraphy, depth, elevation, year drilled, etc. For all water well data or oil and gas well data for Ontario please refer to WWIS and OOGW.

Government Publication Date: 1875-Jul 2018

Certificates of Approval: Provincial CA

This database contains the following types of approvals: Air & Noise, Industrial Sewage, Municipal & Private Sewage, Waste Management Systems and Renewable Energy Approvals. The MOE in Ontario states that any facility that releases emissions to the atmosphere, discharges contaminants to ground or surface water, provides potable water supplies, or stores, transports or disposes of waste, must have a Certificate of Approval before it can operate lawfully. Fields include approval number, business name, address, approval date, approval type and status. This database will no longer be updated, as CofA's have been replaced by either Environmental Activity and Sector Registry (EASR) or Environmental Compliance Approval (ECA). Please refer to those individual databases for any information after Oct.31, 2011.

Government Publication Date: 1985-Oct 30, 2011*

Dry Cleaning Facilities: Federal CDRY

List of dry cleaning facilities made available by Environment and Climate Change Canada. Environment and Climate Change Canada's Tetrachloroethylene (Use in Dry Cleaning and Reporting Requirements) Regulations (SOR/2003-79) are intended to reduce releases of tetrachloroethylene to the environment from dry cleaning facilities.

Government Publication Date: Jan 2004-Dec 2021

Commercial Fuel Oil Tanks: Provincial CFOT

Locations of commercial underground fuel oil tanks. This is not a comprehensive or complete inventory of commercial fuel tanks in the province; this listing is a copy of records of registered commercial underground fuel oil tanks obtained under Access to Public Information.
Note that the following types of tanks do not require registration: waste oil tanks in apartments, office buildings, residences, etc.; aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Chemical Manufacturers and Distributors: Private CHEM

This database includes information from both a one time study conducted in 1992 and private source and is a listing of facilities that manufacture or distribute chemicals. The production of these chemical substances may involve one or more chemical reactions and/or chemical separation processes (i.e. fractionation, solvent extraction, crystallization, etc.).

Government Publication Date: 1999-Jan 31, 2020

Chemical Register: Private CHM

This database includes a listing of locations of facilities within the Province or Territory that either manufacture and/or distributes chemicals.

Government Publication Date: 1999-Feb 28, 2023

Compressed Natural Gas Stations: Private CNG

Canada has a network of public access compressed natural gas (CNG) refuelling stations. These stations dispense natural gas in compressed form at 3,000 pounds per square inch (psi), the pressure which is allowed within the current Canadian codes and standards. The majority of natural gas refuelling is located at existing retail gasoline that have a separate refuelling island for natural gas. This list of stations is made available by the Canadian Natural Gas Vehicle Alliance.

Government Publication Date: Dec 2012 -Sep 2022

Inventory of Coal Gasification Plants and Coal Tar Sites: Provincial COAL

This inventory includes both the "Inventory of Coal Gasification Plant Waste Sites in Ontario-April 1987" and the Inventory of Industrial Sites Producing or Using Coal Tar and Related Tars in Ontario-November 1988) collected by the MOE. It identifies industrial sites that produced and continue to produce or use coal tar and other related tars. Detailed information is available and includes: facility type, size, land use, information on adjoining properties, soil condition, site operators/occupants, site description, potential environmental impacts and historic maps available. This was a one-time inventory.*

Government Publication Date: Apr 1987 and Nov 1988*

Compliance and Convictions: Provincial CONV

This database summarizes the fines and convictions handed down by the Ontario courts beginning in 1989. Companies and individuals named here have been found guilty of environmental offenses in Ontario courts of law.

Government Publication Date: 1989-Feb 2023

Certificates of Property Use: Provincial CPU

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include CPU's on the registry such as (EPA s. 168.6) - Certificate of Property Use.

Government Publication Date: 1994 - Feb 28, 2023

Drill Hole Database: Provincial DRL

The Ontario Drill Hole Database contains information on more than 113,000 percussion, overburden, sonic and diamond drill holes from assessment files on record with the department of Mines and Minerals. Please note that limited data is available for southern Ontario, as it was the last area to be completed. The database was created when surveys submitted to the Ministry were converted in the Assessment File Research Image Database (AFRI) project. However, the degree of accuracy (coordinates) as to the exact location of drill holes is dependent upon the source document submitted to the MNDM. Levels of accuracy used to locate holes are: centering on the mining claim; a sketch of the mining claim; a 1:50,000 map; a detailed company map; or from submitted a "Report of Work".

Government Publication Date: 1886 - Oct 2022

Delisted Fuel Tanks: Provincial DTNK

List of fuel storage tank sites that were once found in - and have since been removed from - the list of fuel storage tanks made available by the regulatory agency under Access to Public Information.

Government Publication Date: Feb 28, 2022

Environmental Activity and Sector Registry: Provincial EASR

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. The EASR allows businesses to register certain activities with the ministry, rather than apply for an approval. The registry is available for common systems and processes, to which preset rules of operation can be applied. The EASR is currently available for: heating systems, standby power systems and automotive refinishing. Businesses whose activities aren't subject to the EASR may apply for an ECA (Environmental Compliance Approval), Please see our ECA database.

Government Publication Date: Oct 2011- Feb 28, 2023

Environmental Registry: Provincial EBR

The Environmental Registry lists proposals, decisions and exceptions regarding policies, Acts, instruments, or regulations that could significantly affect the environment. Through the Registry, thirteen provincial ministries notify the public of upcoming proposals and invite their comments. For example, if a local business is requesting a permit, license, or certificate of approval to release substances into the air or water; these are notified on the registry. Data includes: Approval for discharge into the natural environment other than water (i.e. Air) - EPA s. 9, Approval for sewage works - OWRA s. 53(1), and EPA s. 27 - Approval for a waste disposal site. For information regarding Permit to Take Water (PTTW), Certificate of Property Use (CPU) and (ORD) Orders please refer to those individual databases.

Government Publication Date: 1994 - Feb 28, 2023

Environmental Compliance Approval: Provincial ECA

On October 31, 2011, a smarter, faster environmental approvals system came into effect in Ontario. In the past, a business had to apply for multiple approvals (known as certificates of approval) for individual processes and pieces of equipment. Today, a business either registers itself, or applies for a single approval, depending on the types of activities it conducts. Businesses whose activities aren't subject to the EASR may apply for an ECA. A single ECA addresses all of a business's emissions, discharges and wastes. Separate approvals for air, noise and waste are no longer required. This database will also include Renewable Energy Approvals. For certificates of approval prior to Nov 1st, 2011, please refer to the CA database. For all Waste Disposal Sites please refer to the WDS database.

Government Publication Date: Oct 2011- Feb 28, 2023

Environmental Effects Monitoring: Federal EEM

The Environmental Effects Monitoring program assesses the effects of effluent from industrial or other sources on fish, fish habitat and human usage of fisheries resources. Since 1992, pulp and paper mills have been required to conduct EEM studies under the Pulp and Paper Effluent Regulations. This database provides information on the mill name, geographical location and sub-lethal toxicity data.

Government Publication Date: 1992-2007*

ERIS Historical Searches: Private EHS

ERIS has compiled a database of all environmental risk reports completed since March 1999. Available fields for this database include: site location, date of report, type of report, and search radius. As per all other databases, the ERIS database can be referenced on both the map and "Statistical Profile" page.

Government Publication Date: 1999-Dec 31, 2022

Environmental Issues Inventory System: Federal EIIS

The Environmental Issues Inventory System was developed through the implementation of the Environmental Issues and Remediation Plan. This plan was established to determine the location and severity of contaminated sites on inhabited First Nation reserves, and where necessary, to remediate those that posed a risk to health and safety; and to prevent future environmental problems. The EIIS provides information on the reserve under investigation, inventory number, name of site, environmental issue, site action (Remediation, Site Assessment), and date investigation completed.

Government Publication Date: 1992-2001*

Emergency Management Historical Event: Provincial EMHE

List of locations of historical occurrences of emergency events, including those assigned to the Ministry of Natural Resources by Order-In-Council (OIC) under the Emergency Management and Civil Protection Act, as well as events where MNR provided requested emergency response assistance. Many of these events will have involved community evacuations, significant structural loss, and/or involvement of MNR emergency response staff. These events fall into one of ten (10) type categories: Dam Failure; Drought / Low Water; Erosion; Flood; Forest Fire; Soil and Bedrock Instability; Petroleum Resource Center Event, EMO Requested Assistance, Continuity of Operations Event, Other Requested Assistance. EMHE record details are reproduced by ERIS under License with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2017.

Government Publication Date: Apr 30, 2022

Environmental Penalty Annual Report: Provincial EPAR

This database contains data from Ontario's annual environmental penalty report published by the Ministry of the Environment and Climate Change. These reports provide information on environmental penalties for land or water violations issued to companies in one of the nine industrial sectors covered by the Municipal Industrial Strategy for Abatement (MISA) regulations.

Government Publication Date: Jan 1, 2011 - Dec 31, 2021

List of Expired Fuels Safety Facilities: Provincial EXP

List of facilities and tanks for which there was once a fuel registration. This is not a comprehensive or complete inventory of expired tanks/tank facilities in the province; this listing is a copy of previously registered tanks and facilities obtained under Access to Public Information. Includes private fuel outlets, bulk plants, fuel oil tanks, gasoline stations, marinas, propane filling stations, liquid fuel tanks, piping systems, etc; includes tanks which have been removed from the ground.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Federal Convictions: Federal FCON

Environment Canada maintains a database referred to as the "Environmental Registry" that details prosecutions under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act (FA). Information is provided on the company name, location, charge date, offence and penalty.

Government Publication Date: 1988-Jun 2007*

Contaminated Sites on Federal Land: Federal FCS

The Federal Contaminated Sites Inventory includes information on known federal contaminated sites under the custodianship of departments, agencies and consolidated Crown corporations as well as those that are being or have been investigated to determine whether they have contamination arising from past use that could pose a risk to human health or the environment. The inventory also includes non-federal contaminated sites for which the Government of Canada has accepted some or all financial responsibility. It does not include sites where contamination has been caused by, and which are under the control of, enterprise Crown corporations, private individuals, firms or other levels of government. Includes fire training sites and sites at which Per- and Polyfluoroalkyl Substances (PFAS) are a concern.

Government Publication Date: Jun 2000-Mar 2023

Fisheries & Oceans Fuel Tanks: Federal FOFT

Fisheries & Oceans Canada maintains an inventory of aboveground & underground fuel storage tanks located on Fisheries & Oceans property or controlled by DFO. Our inventory provides information on the site name, location, tank owner, tank operator, facility type, storage tank location, tank contents & capacity, and date of tank installation.

Government Publication Date: 1964-Sep 2019

Federal Identification Registry for Storage Tank Systems (FIRSTS): Federal FRST

A list of federally regulated Storage tanks from the Federal Identification Registry for Storage Tank Systems (FIRSTS). FIRSTS is Environment and Climate Change Canada's database of storage tank systems subject to the Storage Tank for Petroleum Products and Allied Petroleum Products Regulations. The main objective of the Regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. Storage tank systems that do not have a valid identification number displayed in a readily visible location on or near the storage tank system may be refused product delivery.

Government Publication Date: May 31, 2018

Fuel Storage Tank: Provincial FST

List of registered private and retail fuel storage tanks. This is not a comprehensive or complete inventory of private and retail fuel storage tanks in the province; this listing is a copy of registered private and retail fuel storage tanks, obtained under Access to Public Information.
Notes: registration was not required for private fuel underground/aboveground storage tanks prior to January 1990, nor for furnace oil tanks prior to May 1, 2002; registration is not required for waste oil tanks in apartments, office buildings, residences, etc., or aboveground gas or diesel tanks. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Fuel Storage Tank - Historic: Provincial FSTH

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks. Public records of private fuel storage tanks are only available since the registration became effective in September 1989. This information is now collected by the Technical Standards and Safety Authority.

Government Publication Date: Pre-Jan 2010*

Ontario Regulation 347 Waste Generators Summary: Provincial GEN

Regulation 347 of the Ontario EPA defines a waste generation site as any site, equipment and/or operation involved in the production, collection, handling and/or storage of regulated wastes. A generator of regulated waste is required to register the waste generation site and each waste produced, collected, handled, or stored at the site. This database contains the registration number, company name and address of registered generators including the types of hazardous wastes generated. It includes data on waste generating facilities such as: drycleaners, waste treatment and disposal facilities, machine shops, electric power distribution etc. This information is a summary of all years from 1986 including the most currently available data. Some records may contain, within the company name, the phrase "See & Use..." followed by a series of letters and numbers. This occurs when one company is amalgamated with or taken over by another registered company. The number listed as "See & Use", refers to the new ownership and the other identification number refers to the original ownership. This phrase serves as a link between the 2 companies until operations have been fully transferred.

Government Publication Date: 1986-Oct 31, 2022

Greenhouse Gas Emissions from Large Facilities: Federal GHG

List of greenhouse gas emissions from large facilities made available by Environment Canada. Greenhouse gas emissions in kilotonnes of carbon dioxide equivalents (kt CO2 eq).

Government Publication Date: 2013-Dec 2019

TSSA Historic Incidents: Provincial HINC

List of historic incidences of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen recorded by the TSSA in their previous incident tracking system. The TSSA's Fuels Safety Program administers the Technical Standards & Safety Act 2000, providing fuel-related safety services associated with the safe transportation, storage, handling and use of fuels such as gasoline, diesel, propane, natural gas and hydrogen. Under this Act, the TSSA regulates fuel suppliers, storage facilities, transport trucks, pipelines, contractors and equipment or appliances that use fuels. Records are not verified for accuracy or completeness. This is not a comprehensive or complete inventory of historical fuel spills and leaks in the province. This listing is a copy of the data captured at one moment in time and is hence limited by the record date provided here.

Government Publication Date: 2006-June 2009*

Indian & Northern Affairs Fuel Tanks: Federal IAFT

The Department of Indian & Northern Affairs Canada (INAC) maintains an inventory of aboveground & underground fuel storage tanks located on both federal and crown land. Our inventory provides information on the reserve name, location, facility type, site/facility name, tank type, material & ID number, tank contents & capacity, and date of tank installation.

Government Publication Date: 1950-Aug 2003*

Fuel Oil Spills and Leaks: Provincial INC

Listing of spills and leaks of diesel, fuel oil, gasoline, natural gas, propane, and hydrogen reported to the Spills Action Centre (SAC). This is not a comprehensive or complete inventory of fuel-related leaks, spills, and incidents in the province; this listing in a copy of incidents reported to the SAC, obtained under Access to Public Information. Includes incidents from fuel-related hazards such as spills, fires, and explosions. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Landfill Inventory Management Ontario: Provincial LIMO

The Landfill Inventory Management Ontario (LIMO) database is updated every year, as the Ministry of the Environment, Conservation and Parks compiles new and updated information. Includes small and large landfills currently operating as well as those which are closed and historic. Operators of larger landfills provide landfill information for the previous operating year to the ministry for LIMO including: estimated amount of total waste received, landfill capacity, estimated total remaining landfill capacity, fill rates, engineering designs, reporting and monitoring details, size of location, service area, approved waste types, leachate of site treatment, contaminant attenuation zone and more. The small landfills include information such as site owner, site location and certificate of approval # and status.

Government Publication Date: Mar 21, 2022

Canadian Mine Locations: Private MINE

This information is collected from the Canadian & American Mines Handbook. The Mines database is a national database that provides over 290 listings on mines (listed as public companies) dealing primarily with precious metals and hard rocks. Listed are mines that are currently in operation, closed, suspended, or are still being developed (advanced projects). Their locations are provided as geographic coordinates (x, y and/or longitude, latitude). As of 2002, data pertaining to Canadian smelters and refineries has been appended to this database.

Government Publication Date: 1998-2009*

Mineral Occurrences: Provincial MNR

In the early 70's, the Ministry of Northern Development and Mines created an inventory of approximately 19,000 mineral occurrences in Ontario, in regard to metallic and industrial minerals, as well as some information on building stones and aggregate deposits. Please note that the "Horizontal Positional Accuracy" is approximately +/- 200 m. Many reference elements for each record were derived from field sketches using pace or chain/tape measurements against claim posts or topographic features in the area. The primary limiting factor for the level of positional accuracy is the scale of the source material. The testing of horizontal accuracy of the source materials was accomplished by comparing the plan metric (X and Y) coordinates of that point with the coordinates of the same point as defined from a source of higher accuracy.

Government Publication Date: 1846-Feb 2023

National Analysis of Trends in Emergencies System (NATES): Federal NATE

In 1974 Environment Canada established the National Analysis of Trends in Emergencies System (NATES) database, for the voluntary reporting of significant spill incidents. The data was to be used to assist in directing the work of the emergencies program. NATES ran from 1974 to 1994. Extensive information is available within this database including company names, place where the spill occurred, date of spill, cause, reason and source of spill, damage incurred, and amount, concentration, and volume of materials released.

Government Publication Date: 1974-1994*

Non-Compliance Reports: Provincial NCPL

The Ministry of the Environment provides information about non-compliant discharges of contaminants to air and water that exceed legal allowable limits, from regulated industrial and municipal facilities. A reported non-compliance failure may be in regard to a Control Order, Certificate of Approval, Sectoral Regulation or specific regulation/act.

Government Publication Date: Dec 31, 2021

National Defense & Canadian Forces Fuel Tanks: Federal NDFT

The Department of National Defense and the Canadian Forces maintains an inventory of all aboveground & underground fuel storage tanks located on DND lands. Our inventory provides information on the base name, location, tank type & capacity, tank contents, tank class, date of tank installation, date tank last used, and status of tank as of May 2001. This database will no longer be updated due to the new National Security protocols which have prohibited any release of this database.

Government Publication Date: Up to May 2001*

National Defense & Canadian Forces Spills: Federal NDSP

The Department of National Defense and the Canadian Forces maintains an inventory of spills to land and water. All spill sites have been classified under the "Transportation of Dangerous Goods Act - 1992". Our inventory provides information on the facility name, location, spill ID #, spill date, type of spill, as well as the quantity of substance spilled & recovered.

Government Publication Date: Mar 1999-Apr 2018

National Defence & Canadian Forces Waste Disposal Sites: Federal NDWD

The Department of National Defence and the Canadian Forces maintains an inventory of waste disposal sites located on DND lands. Where available, our inventory provides information on the base name, location, type of waste received, area of site, depth of site, year site opened/closed and status.

Government Publication Date: 2001-Apr 2007*

National Energy Board Pipeline Incidents: Federal NEBI

Locations of pipeline incidents from 2008 to present, made available by the Canada Energy Regulator (CER) - previously the National Energy Board (NEB). Includes incidents reported under the Onshore Pipeline Regulations and the Processing Plant Regulations related to pipelines under federal jurisdiction, does not include incident data related to pipelines under provincial or territorial jurisdiction.

Government Publication Date: 2008-Jun 30, 2021

National Energy Board Wells: Federal NEBP

The NEBW database contains information on onshore & offshore oil and gas wells that are outside provincial jurisdiction(s) and are thereby regulated by the National Energy Board. Data is provided regarding the operator, well name, well ID No./UWI, status, classification, well depth, spud and release date.

Government Publication Date: 1920-Feb 2003*

National Environmental Emergencies System (NEES): Federal NEES

In 2000, the Emergencies program implemented NEES, a reporting system for spills of hazardous substances. For the most part, this system only captured data from the Atlantic Provinces, some from Quebec and Ontario and a portion from British Columbia. Data for Alberta, Saskatchewan, Manitoba and the Territories was not captured. However, NEES is also a repository for previous Environment Canada spill datasets. NEES is composed of the historic datasets ' or Trends ' which dates from approximately 1974 to present. NEES Trends is a compilation of historic databases, which were merged and includes data from NATES (National Analysis of Trends in Emergencies System), ARTS (Atlantic Regional Trends System), and NEES. In 2001, the Emergencies Program determined that variations in reporting regimes and requirements between federal and provincial agencies made national spill reporting and trend analysis difficult to achieve. As a consequence, the department has focused efforts on capturing data on spills of substances which fall under its legislative authority only (CEPA and FA). As such, the NEES database will be decommissioned in December 2004.

Government Publication Date: 1974-2003*

National PCB Inventory: Federal NPCB

Environment Canada's National PCB inventory includes information on in-use PCB containing equipment in Canada including federal, provincial and private facilities. Federal out-of-service PCB containing equipment and PCB waste owned by the federal government or by federally regulated industries such as airlines, railway companies, broadcasting companies, telephone and telecommunications companies, pipeline companies, etc. are also listed. Although it is not Environment Canada's mandate to collect data on non-federal PCB waste, the National PCB inventory includes some information on provincial and private PCB waste and storage sites. Some addresses provided may be Head Office addresses and are not necessarily the location of where the waste is being used or stored.

Government Publication Date: 1988-2008*

National Pollutant Release Inventory: Federal NPRI

Environment Canada has defined the National Pollutant Release Inventory ("NPRI") as a federal government initiative designed to collect comprehensive national data regarding releases to air, water, or land, and waste transfers for recycling for more than 300 listed substances.

Government Publication Date: 1993-May 2017

Oil and Gas Wells: Private OGWE

The Nickle's Energy Group (publisher of the Daily Oil Bulletin) collects information on drilling activity including operator and well statistics. The well information database includes name, location, class, status and depth. The main Nickle's database is updated on a daily basis, however, this database is updated on a monthly basis. More information is available at www.nickles.com.

Government Publication Date: 1988-Nov 30, 2022

Ontario Oil and Gas Wells: Provincial OOGW

In 1998, the MNR handed over to the Ontario Oil, Gas and Salt Resources Corporation, the responsibility of maintaining a database of oil and gas wells drilled in Ontario. The OGSR Library has over 20,000+ wells in their database. Information available for all wells in the ERIS database include well owner/operator, location, permit issue date, and well cap date, license No., status, depth and the primary target (rock unit) of the well being drilled. All geology/stratigraphy table information, plus all water table information is also provide for each well record.

Government Publication Date: 1800-Aug 2021

Inventory of PCB Storage Sites: Provincial OPCB

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of PCB storage sites within the province. Ontario Regulation 11/82 (Waste Management - PCB) and Regulation 347 (Generator Waste Management) under the Ontario EPA requires the registration of inactive PCB storage equipment and/or disposal sites of PCB waste with the Ontario Ministry of Environment. This database contains information on: 1) waste quantities; 2) major and minor sites storing liquid or solid waste; and 3) a waste storage inventory.

Government Publication Date: 1987-Oct 2004; 2012-Dec 2013

Orders: Provincial ORD

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include Orders on the registry such as (EPA s. 17) - Order for remedial work, (EPA s. 18) - Order for preventative measures, (EPA s. 43) - Order for removal of waste and restoration of site, (EPA s. 44) - Order for conformity with Act for waste disposal sites, (EPA s. 136) - Order for performance of environmental measures.

Government Publication Date: 1994 - Feb 28, 2023

Canadian Pulp and Paper: Private PAP

This information is part of the Pulp and Paper Canada Directory. The Directory provides a comprehensive listing of the locations of pulp and paper mills and the products that they produce.

Government Publication Date: 1999, 2002, 2004, 2005, 2009-2014

Parks Canada Fuel Storage Tanks: Federal PCFT

Canadian Heritage maintains an inventory of known fuel storage tanks operated by Parks Canada, in both National Parks and at National Historic Sites. The database details information on site name, location, tank install/removal date, capacity, fuel type, facility type, tank design and owner/operator.

Government Publication Date: 1920-Jan 2005*

Pesticide Register: Provincial PES

The Ontario Ministry of the Environment and Climate Change maintains a database of licensed operators and vendors of registered pesticides.

Government Publication Date: Oct 2011- Feb 28, 2023

Pipeline Incidents: Provincial PINC

List of pipeline incidents (strikes, leaks, spills). This is not a comprehensive or complete inventory of pipeline incidents in the province; this listing in an historical copy of records previously obtained under Access to Public Information. Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2021

Private and Retail Fuel Storage Tanks: Provincial PRT

The Fuels Safety Branch of the Ontario Ministry of Consumer and Commercial Relations maintained a database of all registered private fuel storage tanks and licensed retail fuel outlets. This database includes an inventory of locations that have gasoline, oil, waste oil, natural gas and/or propane storage tanks on their property. The MCCR no longer collects this information. This information is now collected by the Technical Standards and Safety Authority (TSSA).

Government Publication Date: 1989-1996*

Permit to Take Water: Provincial PTTW

This is a subset taken from Ontario's Environmental Registry (EBR) database. It will include PTTW's on the registry such as OWRA s. 34 - Permit to take water.

Government Publication Date: 1994 - Feb 28, 2023

Ontario Regulation 347 Waste Receivers Summary: Provincial REC

Part V of the Ontario Environmental Protection Act ("EPA") regulates the disposal of regulated waste through an operating waste management system or a waste disposal site operated or used pursuant to the terms and conditions of a Certificate of Approval or a Provisional Certificate of Approval. Regulation 347 of the Ontario EPA defines a waste receiving site as any site or facility to which waste is transferred by a waste carrier. A receiver of regulated waste is required to register the waste receiving facility. This database represents registered receivers of regulated wastes, identified by registration number, company name and address, and includes receivers of waste such as: landfills, incinerators, transfer stations, PCB storage sites, sludge farms and water pollution control plants. This information is a summary of all years from 1986 including the most currently available data.

Government Publication Date: 1986-1990, 1992-2020

Record of Site Condition: Provincial RSC

The Record of Site Condition (RSC) is part of the Ministry of the Environment's Brownfields Environmental Site Registry. Protection from environmental cleanup orders for property owners is contingent upon documentation known as a record of site condition (RSC) being filed in the Environmental Site Registry. In order to file an RSC, the property must have been properly assessed and shown to meet the soil, sediment and groundwater standards appropriate for the use (such as residential) proposed to take place on the property. The Record of Site Condition Regulation (O. Reg. 153/04) details requirements related to site assessment and clean up.
RSCs filed after July 1, 2011 will also be included as part of the new (O.Reg. 511/09).

Government Publication Date: 1997-Sept 2001, Oct 2004-Mar 2023

Retail Fuel Storage Tanks: Private RST

This database includes an inventory of retail fuel outlet locations (including marinas) that have on their property gasoline, oil, waste oil, natural gas and / or propane storage tanks.

Government Publication Date: 1999-Feb 28, 2023

Scott's Manufacturing Directory: Private SCT

Scott's Directories is a data bank containing information on over 200,000 manufacturers across Canada. Even though Scott's listings are voluntary, it is the most comprehensive database of Canadian manufacturers available. Information concerning a company's address, plant size, and main products are included in this database.

Government Publication Date: 1992-Mar 2011*

Ontario Spills: Provincial SPL

List of spills and incidents made available the Ministry of the Environment, Conservation and Parks. This database identifies information such as location (approximate), type and quantity of contaminant, date of spill, environmental impact, cause, nature of impact, etc. Information from 1988-2002 was part of the ORIS (Occurrence Reporting Information System). The SAC (Spills Action Centre) handles all spills reported in Ontario. Regulations for spills in Ontario are part of the MOE's Environmental Protection Act, Part X. The Ministry of the Environment, Conservation and Parks cites the coronavirus pandemic as an explanation for delays in releasing data pursuant to requests.

Government Publication Date: 1988-Mar 2021; May 2021-Oct 2021

Wastewater Discharger Registration Database: Provincial SRDS

Facilities that report either municipal treated wastewater effluent or industrial wastewater discharges under the Effluent Monitoring and Effluent Limits (EMEL) and Municipal/Industrial Strategy for Abatement Regulations. The Municipal/Industrial Strategy for Abatement (MISA) division of the Ontario Ministry of Environment keeps record of direct dischargers of toxic pollutants within nine sectors including: Electric Power Generation, Mining, Petroleum Refining, Organic Chemicals, Inorganic Chemicals, Pulp & Paper, Metal Casting, Iron & Steel, and Quarries.

Government Publication Date: 1990-Dec 31, 2020

Anderson's Storage Tanks: Private TANK

The information provided in this database was collected by examining various historical documents, which identified the location of former storage tanks, containing substances such as fuel, water, gas, oil, and other various types of miscellaneous products. Information is available in regard to business operating at tank site, tank location, permit year, permit & installation type, no. of tanks installed & configuration and tank capacity. Data contained within this database pertains only to the city of Toronto and is not warranted to be complete, exhaustive or authoritative. The information was collected for research purposes only.

Government Publication Date: 1915-1953*

Transport Canada Fuel Storage Tanks: Federal TCFT

List of fuel storage tanks currently or previously owned or operated by Transport Canada. This inventory also includes tanks on The Pickering Lands, which refers to 7,530 hectares (18,600 acres) of land in Pickering, Markham, and Uxbridge owned by the Government of Canada since 1972; properties on this land has been leased by the government since 1975, and falls under the Site Management Policy of Transport Canada, but is administered by Public Works and Government Services Canada. This inventory provides information on the site name, location, tank age, capacity and fuel type.

Government Publication Date: 1970 - Apr 2020

Variances for Abandonment of Underground Storage Tanks: Provincial VAR

Listing of variances granted for storage tank abandonment. This is not a comprehensive or complete inventory of tank abandonment variances in the province; this listing is a copy of tank abandonment variance records previously obtained under Access to Public Information. In Ontario, registered underground storage tanks must be removed within two years of disuse; if removal of a tank is not feasible, an application may be sought for a variance from this code requirement.
Records are not verified for accuracy or completeness.

Government Publication Date: Feb 28, 2022

Waste Disposal Sites - MOE CA Inventory: Provincial WDS

The Ontario Ministry of Environment, Waste Management Branch, maintains an inventory of known open (active or inactive) and closed disposal sites in the Province of Ontario. Active sites maintain a Certificate of Approval, are approved to receive and are receiving waste. Inactive sites maintain Certificate(s) of Approval but are not receiving waste. Closed sites are not receiving waste. The data contained within this database was compiled from the MOE's Certificate of Approval database. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number. All new Environmental Compliance Approvals handed out after Oct 31, 2011 for Waste Disposal Sites will still be found in this database.

Government Publication Date: Oct 2011- Feb 28, 2023

Waste Disposal Sites - MOE 1991 Historical Approval Inventory: Provincial WDSH

In June 1991, the Ontario Ministry of Environment, Waste Management Branch, published the "June 1991 Waste Disposal Site Inventory", of all known active and closed waste disposal sites as of October 30st, 1990. For each "active" site as of October 31st 1990, information is provided on site location, site/CA number, waste type, site status and site classification. For each "closed" site as of October 31st 1990, information is provided on site location, site/CA number, closure date and site classification. Locations of these sites may be cross-referenced to the Anderson database described under ERIS's Private Source Database section, by the CA number.

Government Publication Date: Up to Oct 1990*

Water Well Information System: Provincial WWIS

This database describes locations and characteristics of water wells found within Ontario in accordance with Regulation 903. It includes such information as coordinates, construction date, well depth, primary and secondary use, pump rate, static water level, well status, etc. Also included are detailed stratigraphy information, approximate depth to bedrock and the approximate depth to the water table.

Government Publication Date: Jun 30 2022

Definitions

Database Descriptions: This section provides a detailed explanation for each database including: source, information available, time coverage, and acronyms used. They are listed in alphabetic order.

Detail Report: This is the section of the report which provides the most detail for each individual record. Records are summarized by location, starting with the project property followed by records in closest proximity.

Distance: The distance value is the distance between plotted points, not necessarily the distance between the sites' boundaries. All values are an approximation.

Direction: The direction value is the compass direction of the site in respect to the project property and/or center point of the report.

Elevation: The elevation value is taken from the location at which the records for the site address have been plotted. All values are an approximation. Source: Google Elevation API.

Executive Summary: This portion of the report is divided into 3 sections:

'Report Summary'- Displays a chart indicating how many records fall on the project property and, within the report search radii.

'Site Report Summary'-Project Property'- This section lists all the records which fall on the project property. For more details, see the 'Detail Report' section.

'Site Report Summary-Surrounding Properties'- This section summarizes all records on adjacent properties, listing them in order of proximity from the project property. For more details, see the 'Detail Report' section.

Map Key: The map key number is assigned according to closest proximity from the project property. Map Key numbers always start at #1. The project property will always have a map key of '1' if records are available. If there is a number in brackets beside the main number, this will indicate the number of records on that specific property. If there is no number in brackets, there is only one record for that property.

The symbol and colour used indicates 'elevation': the red inverted triangle will dictate 'ERIS Sites with Lower Elevation', the yellow triangle will dictate 'ERIS Sites with Higher Elevation' and the orange square will dictate 'ERIS Sites with Same Elevation.'

Unplottables: These are records that could not be mapped due to various reasons, including limited geographic information. These records may or may not be in your study area, and are included as reference.

APPENDIX E

MECP Response

Ministry of the Environment, Conservation and Parks

Access and Privacy Office

12th Floor
40 St. Clair Avenue West
Toronto ON M4V 1M2
Tel: (416) 314-4075

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Bureau de l'accès à l'information et de la protection de la vie privée

12e étage
40, avenue St. Clair ouest
Toronto ON M4V 1M2
Tél. : (416) 314-4075

Ontario

April 24, 2023

Julie Crooks
Pinchin Ltd.
1 Hines Road, Suite 200
Kanata, ON K2K 3C7
jcrooks@pinchin.com

Dear Julie Crooks:

RE: MECP FOI A-2022-01912, Your Reference #307315 - Record Release Letter

This letter is further to your request made pursuant to the Freedom of Information and Protection of Privacy Act (the Act) relating to 2275 Mer Bleue Road, Ottawa.

Attached is a copy of the records.

If you have any questions, please contact me at kevin.church@ontario.ca or 647-643-0995.

Yours truly,

Kevin Church for:

Ryan Gunn
Manager (A), Access and Privacy Office

David Schaeffer Engineering Ltd.
120 Iber Road, Suite 103
Stittsville, ON K2S 1E9
613-836-0856
dsel.ca

DESIGN BRIEF

FOR

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

CAIVAN (MER-BLEUE) INC.

CITY OF OTTAWA

PROJECT NO.: 20-1214

2ND SUBMISSION JUNE 2022

© DSEL

DESIGN BRIEF
FOR
CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

CAIVAN (MER-BLEUE) INC.

PROJECT NO.: 20-1214

TABLE OF CONTENTS

FIGURES AND DRAWINGS

TABLES

© DSEL

APPENDICES

Appendix A Pre-Consultation and Existing Approvals

Pre-consultation e-mail from City of Ottawa
(Steve Belan, September 30, 2020)

Avalon West (N5) SWM Pond
MECP ECA #6142-BEJHCE (August 1, 2019)

Tenth Line Pump Station
MECP ECA #7375-A8QGEU (April 12, 2016)

Avalon Encore – Stage 5 Sewers
MECP ECA #0606-AHXJCH (February 2, 2017)

Avalon Encore – Stage 6 Sewers
MECP ECA #8605-AYUHJG (May 30, 2018)

Appendix B Record Drawings

Avalon Encore Stage 6, Plan and Profile of Aquarium Avenue & Commercial Walkway, Drawing 170401-P58 by Atrel Engineering (March 16, 2018)

Avalon Encore Stage 6, As-Built Plan and Profile of Sculpin Street, Drawing 170401-P62 by Atrel Engineering (April 26, 2018)

Mer Bleue Road Widening, Grading & Drainage Plan, ISD14-5053, Drawings P4 & P5 (October 28, 2016)

Topographic Surveys: AOV (September 20, 2019) & JD Barnes (March 24, 2022)

Appendix C Water Supply

2275 Mer Bleue Rd: Water Distribution System Analysis, Stantec Consulting (April 18, 2022)

© DSEL

Appendix D Wastewater Collection

Avalon Encore Stage 6, Sanitary Drainage Area Plan, Drawing 170401-SAN1 by Atrel Engineering (March 16, 2018)

Avalon Encore Stage 6, Sanitary Drainage Area Plan, Drawing 170401-SAN2 by Atrel Engineering (March 16, 2018)

Avalon Encore Stage 6, Sanitary Sewer Computation Form by Atrel Engineering (March 2018)

Sanitary Sewer Calculation Sheet by DSEL (June 2022)

DSEL Sanitary Drainage Plan (Drawing 18, Rev2)

Appendix E Stormwater Management

Avalon Encore Stage 6, Storm Drainage Area Plan, Drawing 170401-STM1 & STM2 by Atrel Engineering (March 16, 2018)

Avalon Encore, Storm Sewer Computation Form by Atrel Engineering (March 2017)

Storm Sewer Calculation Sheet by DSEL (June 2022)

DSEL Storm Drainage Plan (Drawing 19, Rev2)

Stormwater Management Report for Cassette Subdivision, 2275 Mer-Bleue Road, J.F. Sabourin & Associates (June 2022)

© DSEL

DESIGN BRIEF
FOR
CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

CAIVAN (MER-BLEUE) INC.

PROJECT NO.: 20-1214

1.0 INTRODUCTION

David Schaeffer Engineering Limited (DSEL) has been retained by Caivan Communities to prepare a Design Brief in support of detailed engineering design for their proposed Cassette Subdivision located at 2275 Mer-Bleue Road. This current design brief supersedes a prior design submission for the development completed by Urbantech (Urbantech File No 21-102-O) dated December 2021 and will be considered the design report of record at the direction of Caivan (Mer-Bleue) Inc.

The subject lands are currently vacant and is located immediately east of Mer-Bleue Road and south of Brian Coburn Boulevard in the Cumberland Ward (Ward 19) as shown on the ***Figure 1 – Site Location***. The subject site is adjacent to the western boundary of Minto's Avalon Encore – Stage 6 development, which was designed and approved with allowances for the subject site.

The study area:

- Residential area measures approximately 3.36 ha;
- Future Mixed-use lands area measures approximately 0.68 ha (part of a future site plan application process);
- Is located within the City of Ottawa urban boundary in the Cumberland ward;
- Is under the jurisdiction of the South Nation Conservation (SNC) and is within the McKinnon's Creek Watershed; and
- Abuts existing developments on Aquarium Avenue and Sculpin Street.

A topographic survey of the property was completed by Annis, O'Sullivan, Vollebekk Ltd on September 20, 2019 as well as supplemental information gathered by J.D. Barnes Ltd. on December 23, 2020 and March 24, 2022. Copies of the surveys are included in ***Appendix B*** for reference.

This Design Brief is prepared to demonstrate conformance with the design criteria of the City of Ottawa, background studies, and general industry practice.

1.1 Existing Conditions

The subject site generally consists of agricultural land surrounded by existing roads (Mer-Bleue Road, Brian Coburn Boulevard) and existing development (Avalon Encore).

The study area is generally flat with existing elevations ranging from 87.0 m to 88 m.

Based on a ***Geotechnical Investigation, PG5521-1 Revision 1*** by Paterson Group dated March 10, 2021, the subsurface conditions consist of topsoil layer underlain by a deep deposit of silty clay. A hard to stiff brown silty clay crust was observed within the upper 2.7 m to 3.0 m below the ground surface. The weathered silty clay crust was observed to be underlain by a firm to stiff layer of unweathered grey silty clay. The permissible grade raise restrictions are between 88.6 m to 89.2 m for the proposed development.

1.2 Development Concept

The proposed development concept can be seen in ***Figure 2 – Draft Plan***. Within the study area, the proposed land uses include 79 standard townhomes, 44 back-to-back townhomes, a servicing/walkway block and rights-of-way (ROWs). The ROW widths are 18.0m, 16.5 m throughout and 14.0 m on window streets. The 18.0m ROW extends from the proposed development connection to existing Sculpin Street. There is also a future mixed-use density block, which is estimated to potentially have 150 residential units with commercial development on the main floor. That mixed-use block will be the subject of a separate site plan application process by others.

The predicted populations associated with the development concept are described in ***Table 1***:

Table 1: Development Statistic Projections Derived from Concept Plan

Land Use	Total Area (ha)	Projected Residential Units	Residential Population per Unit	Projected Population
Townhomes	2.05	123	2.7	333
Mixed Use Density Block	0.68	150	1.8	270
Walkways / Servicing Block	0.03			
Local Streets	1.28			
Total	**4.04 ha**	**273**		**295**

1.3 Summary of Pre-consultation

The following provides a summary of the pre-consultation to date:

© DSEL

1.3.1 City of Ottawa

A Pre-Application Consultation Meeting was held on September 22, 2020 with City of Ottawa staff to discuss the subject site for a Major Rezoning / Subdivision Application. A copy of the notes, provided in an email from Steve Belan on September 30, 2020, is enclosed in ***Appendix A***.

1.4 Existing Permits / Approvals

The existing permits and approvals relating to the study area are presented in ***Table 2***. The copy of the existing permits and approvals are enclosed in ***Appendix A*** for reference.

Table 2: Existing Permits / Approvals

Agency	Approval Type	Approval Number	Remarks
MECP	Amended Environmental Compliance Approval (ECA)	#6142-BEJHCE (August 1, 2019)	The existing Avalon West (N5) SWM Pond provides the storm outlet for the study area.
MECP	Amended Environmental Compliance Approval (ECA)	#7375-A8QGEU (April 12, 2016)	The existing Tenth Line Pump Station provides the sanitary outlet for the study area.
MECP	Environmental Compliance Approval (ECA)	#0606-AHXJCH (February 2, 2017)	The sanitary and storm sewers in Avalon Encore Stage 5 provide the outlet for the study area.
MECP	Environmental Compliance Approval (ECA)	#8605-AYUHJG (May 30, 2018)	The sanitary and storm sewers in Avalon Encore Stage 6 provide the immediate outlet for the study area.

1.5 Required Permits / Approvals

The required approvals relating to the subject site are presented in ***Table 3.***

Table 3: Required Permits / Approvals

Agency	Permit/Approval Required	Trigger	Remarks
MECP	Environmental Compliance Approval (ECA)	Construction of new sanitary and storm sewers.	The City will review the storm/sanitary sewers on behalf of the MECP through the Transfer of Review process.
MECP	Permit to Take Water (PTTW)	If pumping for construction of proposed land uses (e.g. basements for homes) exceeds 400,000 L/day of ground and/or surface water.	Pumping of groundwater or surface water may be required during construction. Refer to Paterson Group Report PG5521-1 by dated December 22, 2020.

© DSEL

MECP	Environmental Activity and Sector Registry (EASR)	If pumping for construction of proposed land uses (e.g. basements for residential homes) ranges between 50,000 to 400,000 L/day of ground and/or surface water.	Pumping of groundwater or surface water may be required during construction. Refer to Paterson Group Report PG5521-1 by dated December 22, 2020.
City of Ottawa	MECP Form 1 – Record of Watermains Authorized as a Future Alteration.	Construction of watermains.	The City of Ottawa is expected to review the watermains on behalf of the MECP through the Form 1 – Record of Watermains Authorized as a Future Alteration.

2.0 GUIDELINES, PREVIOUS STUDIES, AND REPORTS

2.1 Existing Studies, Guidelines, and Reports

The following documents informed the preparation of this design report:

- **Ottawa Sewer Design Guidelines**
  City of Ottawa, October 2012
  (City Standards)
  - **Technical Bulletin ISDTB-2014-01**
    City of Ottawa, February 5, 2014
    (ITSB-2014-01)
  - **Technical Bulletin PIEDTB-2016-01**
    City of Ottawa, September 6, 2016
    (PIEDTB-2016-01)
  - **Technical Bulletin ISTB-2018-01**
    City of Ottawa, March 21, 2018
    (ISTB-2018-01)
  - **Technical Bulletin ISTB-2019-02**
    City of Ottawa, July 18, 2019
    (ISTB-2019-02)
- **Ottawa Design Guidelines – Water Distribution**
  City of Ottawa, July 2010
  (Water Supply Guidelines)
  - **Technical Bulletin ISD-2010-2**
    City of Ottawa, December 15, 2010
    (ISDTB-2010-2)
  - **Technical Bulletin ISDTB-2014-02**
    City of Ottawa, May 27, 2014
    (ISDTB-2014-02)

© DSEL

- **Technical Bulletin ISDTB-2018-02**
  City of Ottawa, March 21, 2018
  (ISTB-2018-02)

- **Stormwater Management Planning and Design Manual**
  Ministry of Environment, March 2003
  (*SWMP Design Manual)*
- **Erosion & Sediment Control Guidelines for Urban Construction**
  TRCA, 2019
  (E&S Guidelines)
- Geotechnical Investigation, Proposed Residential Development, 2275 Mer Bleue Road (PG5521-1, Revision 1)
  Paterson Group, March 10, 2021
  (*Geotechnical Investigation*)
- Mer Bleue Community Design Plan Infrastructure Servicing Study
  IBI Group, April 2006
  (Mer Bleue CDP ISS)
- Avalon West (Neighbourhood 5) Stormwater Management Facility Design, Revision 5
  IBI Group, October 2013
  (Avalon West N5 SWM Report)
- Avalon West (Neighbourhood 5) Stormwater Management Facility Design, Proposed Mattamy Bisson Lands
  IBI Group, November 3, 2014
  (Avalon West N5 SWM Report Update)
- Avalon Encore Stage 5, Stormwater Management, Watermain, Storm Sewer and Sanitary Sewer Design Brief, Revision 2
  Atrel Engineering, January 2017
  (Stage 5 Design Brief)
- Avalon Encore Stage 6, Stormwater Management and Site Servicing Design Brief
  Atrel Engineering, March 16, 2018
  (Stage 6 Design Brief)
- Design Brief for Interim Expansion of the Avalon West Stormwater Management Pond for the Summerside South Phase 1 Subdivision
  DSEL & JFSA, June 2019
  (Expansion Pond Design Brief)
- 2275 Mer Bleue Rd: Water Distribution System Analysis
  Stantec Consulting Ltd., April 18, 2022
  (*Watermain Analysis*)

© DSEL

3.0 WATER SUPPLY SERVICING

3.1 Existing Water Supply Services

The subject site is located within Zone 2E of the City's water distribution system, per the Water Distribution Mapping excerpt in ***Appendix C,*** which is fed by two booster pumping stations and the Innes Road elevated storage tank at Belcourt Boulevard, providing balancing, fire and emergency storage.

In the vicinity of the site, there are the following existing watermains:

- Existing 400 mm diameter watermain on Mer-Bleue Road;
- Existing 400 mm diameter watermain on Brian Coburn Boulevard;
- Existing 200 mm diameter watermain on a walkway/servicing Block to Aquarium Avenue in Avalon Encore, Stage 6
- Existing 200 mm diameter watermain on Sculpin Street in Avalon Encore, Stage 6.

The existing watermain network surrounding the subject site is depicted on ***Figure 3 – Watermain Servicing Figure***. Refer to the Record Drawings for the adjacent connections, contained in ***Appendix B***. Demands for the subject site have been considered in the detailed design of Avalon Encore, Stage 6 by Atrel Engineering.

3.2 Proposed Water Supply

Water supply to the site will be provided by connection to the municipal water system. As shown on ***Figure 3 – Watermain Servicing Figure***, connections are provided to the 200 mm diameter watermains on the existing walkway/servicing Block to Aquarium Avenue and Sculpin Street in Avalon Encore, Stage 6. A connection to the 400 mm diameter watermain on Mer-Bleue Road will also be provided. As-built information for Mer-Bleue Road infrastructure can be found in ***Appendix B***.

A hydraulic analysis of the proposed watermain network has been prepared by Stantec Consulting (***Watermain Analysis,*** April 18, 2022) and is included in ***Appendix C*** for reference. This updated analysis supersedes a previous Stantec report submission dated January 25, 2022 and includes updated boundary conditions which consider a connection to Mer-Bleue Road in order to mitigate watermain diameters, reflected an updated fire flow condition of 10,000 L/min and eliminate a previously proposed dead end watermain in response to prior City comments.

The proposed development will be serviced internally by 200 mm diameter watermains designed in accordance with the ***Water Supply Guidelines*** as summarized in ***Table 4***. The proposed watermains are depicted on ***Figure 3 – Watermain Servicing Figure***.

© DSEL

Table 4: Water Supply Design Criteria

Design Parameter	Value
Residential - Townhome	2.7 p/unit
Residential – Apartment	1.8 p/unit
Residential – Average Daily Demand	280 L/p/day
Residential - Maximum Daily Demand(2)	3.6 x Average Daily Demand
Residential - Maximum Hourly Demand(2)	5.4 x Maximum Daily Demand
Residential - Minimum Hourly Demand	0.5 x Average Daily Demand
Minimum Watermain Size	150 mm diameter
Minimum Depth of Cover	2.4 m from top of watermain to finished grade
Peak hourly demand operating pressure	276 kPa and 552 kPa
Fire flow operating pressure minimum	140 kPa

Extracted from Section 4: Ottawa Design Guidelines, Water Distribution (July 2010). Daily consumption rates revised to align with the updated wastewater rates identified by City of Ottawa Technical Bulletin ISDTB-2018-02 (March 21, 2018).
(2) See Section 3.2.3 below

The City of Ottawa Water Supply Design Criteria reflected in the ***Stage 6 Design Brief*** was based on the Water Distribution Guidelines; however, since the publication of the report, demands have been updated to correspond to the updated sanitary demand criteria per ISDTB-2018-02 (March 21, 2018).

Based on the existing hydraulic grade line (HGL) in Zone 2E, operating pressures in the development are not anticipated to drop below 276 kPa (40 psi) or exceed 552 kPa (80 psi). Refer to the ***Watermain Analysis***, provided in ***Appendix C***, for the complete analysis that confirms that water supply is available within the required pressure range under the anticipated demand during average day, peak hour and fire flow conditions.

3.2.1 Fire Flow Demand

The City of Ottawa's cap of 10,000 L/min (167 L/s) as outlined in ISDTB-2018-02 has been applied to townhomes.

Discussion is provided within the ***Watermain Analysis*** by Stantec (Stantec Section 2.1.2) with respect to the calculated fire flows based on the Fire Underwriters Survey (FUS) Water Supply for Public Protection (1999) and the City of Ottawa ISDTB-2018-02 guidelines. Refer to the ***Watermain Analysis*** provided in ***Appendix C*** for full calculations for representative blocks. It was determined that a fire flow cap of 10,000 L/min (167 L/s), as outlined in ISTB-2018-02 is applicable for the site

3.2.2 Boundary Conditions

Boundary conditions were requested for specific locations and demands. Boundary conditions in the form of Hydraulic Grade Line (HGL) were provided by the City of Ottawa for Peak Hour, Maximum Day Plus Fire Flow and Maximum HGL (high pressure check). Refer to the boundary condition request located in ***Appendix C*** of the ***Watermain Analysis***.

© DSEL

3.2.3 Water Demand Calculations

A summary of water demands for the study area is presented in ***Table 4.1.*** Due to the size of the service area, the criteria outlined in the City's 2013 Water Distribution Guidelines and the MECP Design Guidelines for Drinking Water Systems were followed by Stantec to establish water demands.

Table 4.1: Summary of Water Demands

Dwelling Type	Number of Units	**Population**		**Demand** (L/cap/day)	**Avg Day** (L/s)	**Max Day** 3.6 x Avg Day (L/s)	**Peak Hour** 5.4 x Max Day (L/s)
		Persons per unit	Population per dwelling type				
Townhomes	123	2.7	333	280	1.08	3.87	5.81
See Stantec's "*2275 Mer Bleue Rd: Water Distribution System Analysis*" dated April 18/22 in Appendix C for full details							

3.3 Water Supply Conclusion

The subject site will be serviced internally by 200 mm watermains, which will be looped to the existing 200 mm diameter watermains on the walkway/servicing Block to Aquarium Avenue and on Sculpin Street, both within Avalon Encore, Stage 6. In addition, a connection will also be made to the existing 400mm diameter watermain located within Mer-Bleue Road to optimized system redundancy.

The subject site was accounted for in the design of Avalon Encore, Stage 6; however, water demands have been lowered since the publication of the ***Stage 6 Design Brief*** due to the release of updated sanitary design guidelines in ISDTB-2018-02 (March 21, 2018).

A detailed hydraulic analysis has been completed to confirm that the proposed water network can deliver all domestic and fire flows as per the Ministry of the Environment, Conservation and Parks, City of Ottawa and Fire Underwriters criteria.

Updated fire flow calculations were completed for the detailed design of the site, confirming that the required fire flows outlined can be met.

© DSEL

4.0 WASTEWATER SERVICING

4.1 Existing Wastewater Services

The proposed sanitary outlet for the development area is the existing sanitary sewers within Minto's Avalon Development, to the Tenth Line Road Pump Station. The existing sewers adjacent to the development are as follows:

- Existing 200 mm diameter sanitary sewer at 0.32% at the existing walkway/servicing Block to Aquarium Avenue; and
- Existing 200 mm diameter sanitary sewer at 0.35% at Sculpin Street.

The Record Drawings for these existing sewers are enclosed in ***Appendix B***.

4.2 Wastewater Design

The sanitary flows from the subject site were accounted for in the Avalon Encore Stage 6 design. Enclosed in ***Appendix D*** are the Sanitary Drainage Area Plan and corresponding sanitary design sheet from the ***Stage 6 Design Brief***.

The allowable sanitary flows in the above design were based on the following:

Walkway Block to Aquarium Avenue @ Existing MH 6059

- 2.20 ha
- Equivalent Population = 314
- Peak Factor = 1.5
- Peak Flow = 1.91 L/s
- Extraneous Flow = 0.62 L/s
- Total Peak Flow = 2.52 L/s

Sculpin Street @ Existing MH 6108*

- 1.96 ha
- Equivalent Population = 280
- Peak Factor = 1.5
- Peak Flow = 1.70 L/s
- Extraneous Flow = 0.55 L/s
- Total Peak Flow = 2.25 L/s

*Note that the sanitary design sheet does not match the sanitary drainage plan from the ***Stage 6 Design Brief***; however, the sanitary drainage plan numbers were used for the comparison to be conservative for allowable flows.

The subject site will be designed with 200 mm diameter sanitary sewers throughout. The proposed sanitary sewer layout and drainage areas are depicted on ***Figure 4 – Sanitary Servicing Figure***.

© DSEL

Table 5 summarizes the ***City Standards*** which have been used in the design of the proposed wastewater sewer system.

Table 5: Wastewater Design Criteria

Design Parameter	Value
Medium Density Residential	2.7 p/unit
Peak Wastewater Generation per Person	280 L/p/d
Peaking Factor Applied	Harmon's Equation (2.0 min, 4.0 max)
Harmon – Correction Factor	0.80
Commercial / Institutional Flows	28,000 L/ha/day
Commercial / Institutional Peak Factor	1.0 (ICI in contributing area is < 20%)
Infiltration and Inflow Allowance	0.33 L/s/ha
Park Peaking Factor	1.5
Sanitary sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	200 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.5 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.6 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 4 and 6 of the City of Ottawa Sewer Design Guidelines (October 2012) and ISTB-2018-01 (March 21, 2018)	

The sanitary design sheets for the subject development area are enclosed in ***Appendix D***.

Applying the criteria in Table 5, the peak sanitary flow from the subject site to the Wwalkway/servicing Block at Aquarium Avenue is 5.95 L/s. The peak sanitary flow from the subject site to Sculpin Street is 2.16 L/s. These flows are in line with those reported within the Functional Servicing Report (5.40 L/s and 2.98 L/s respectively) and slightly higher than the flows that were designed for in the Avalon Encore Stage 6 design. Capacity in the downstream sewers was reviewed to confirm that there is sufficient capacity. It is noted that the downstream system was designed with old design guidelines and the entire network have additional theoretical capacity based on refined parameters.

4.3 Future Commercial Block Service

A sanitary control manhole (SAN Control MH 19A) has been provided to Block 27 to facilitate a future servicing outlet for that property. The manhole will have a knockout provided for the future connection when the site plan is advanced for that area under a separate process.

4.4 Sanitary Hydraulic Grade Line (HGL)

The sanitary emergency overflow structure is located within the City of Ottawa unopened road allowance near the sanitary pump station on Tenth Line Road. As noted in the ***Stage 6 Design Brief***, the sanitary HGL was calculated in conjunction with previous reports, to

© DSEL

confirm that the minimum 0.30 m freeboard was provided throughout the proposed and existing developments. The resulting sanitary HGL elevations for the proposed outlets are shown on the Record Drawings, enclosed in ***Appendix B***. The design for the subject site has regard for the sanitary HGL, providing 0.30 m freeboard throughout the proposed development.

4.5 Wastewater Servicing Conclusion

The subject site discharges sanitary flows at two locations within Avalon Encore Stage 6: easterly to a walkway/servicing Block to Aquarium Avenue and south to Sculpin Street. The adjacent site was designed to convey flows from the subject site. Since the time of publication of the Stage 6 Design Brief, the sanitary design guidelines have been updated to reflect ISTB-2018-01 (March 21, 2018).

Although the peak flows from the proposed site are slightly greater than the flows that were considered in the adjacent design, it has been confirmed that there is sufficient residual capacity in the existing downstream system.

The design has regard for the sanitary HGL, providing 0.30 m freeboard throughout the proposed development.

The sanitary sewers have been designed in accordance with City of Ottawa standards.

© DSEL

5.0 STORMWATER CONVEYANCE

5.1 Existing Conditions

The subject site generally consists of agricultural land surrounded by existing roads (Mer-Bleue Road, Brian Coburn Boulevard) and existing development (Avalon Encore).

The study area is generally flat with existing elevations ranging from 87.0 m to 88.0 m.

Based on a ***Geotechnical Investigation, PG5521-1, Revision 1*** by Paterson Group dated March 10, 2021, the subsurface conditions consist of topsoil layer underlain by a deep deposit of silty clay. A hard to stiff brown silty clay crust was observed within the upper 2.7 m to 3.0 m below the ground surface. The weathered silty clay crust was observed to be underlain by a firm to stiff layer of unweathered grey silty clay. The permissible grade raise restrictions are between 88.6 m to 89.2 m for the proposed development.

There are existing storm sewers within Avalon Encore Stage 6 for the site to discharge to, as follows:

- Existing 975 mm diameter storm sewer at the walkway/serving Block to Aquarium Avenue; and
- Existing 975 mm diameter storm sewer on Sculpin Street.

5.2 Proposed Stormwater Management Strategy

The subject site is tributary to the existing Avalon West (N5) SWM Facility, south of Avalon Encore Stage 5, which will control both the quantity and quality of the stormwater from the subject site before discharging to McKinnon's Creek to the south. The following provides a brief history for the Avalon West (N5) SWM Facility:

- Originally designed for quality and quantity control, in accordance with the October 2013 ***Avalon West (Neighbourhood 5) Stormwater Management Facility Design*** report by IBI Group.
- Later revised to accommodate Mattamy's Summerside West Phases 1, 2 and 3 with the November 2014 ***Update to Avalon West Stormwater Management Facility Design Report: Proposed Mattamy Bisson Lands*** memo by IBI Group and subsequent SWM Reports for Summerside West Phases 1-3.
- An interim expansion of the existing SWM Facility was proposed to accommodate Summerside South phase 1 prior to any improvements to downstream McKinnon's Creek, as detailed in the June 2019 ***Design Brief for Interim Expansion of the Avalon West Stormwater Management Pond for the Summerside South Phase 1 Subdivision*** by DSEL and JFSA.
- The adjacent Avalon Encore Stage 6 has designed and approved with capacity for the subject site. As described in the ***Stage 6 Design Brief***, Avalon Encore Stage

© DSEL

6, including the subject site, falls within the western trunk watershed, which conveys its runoff to the Avalon West (N5) SWM Facility.

5.3 Post-Development Stormwater Management Targets

Stormwater management requirements for the stormwater management scheme have been adopted from the documents noted above, ***City Standards***, and the ***MECP SWMP Manual***.

The following specific standards are expected to be required for stormwater management within the subject property:

- Quality control is not required on site and will be provided through the existing Avalon West (N5) SWM Facility.
- Inflow rate into the minor system shall be limited to 220 L/s/ha as dictated by adjacent system designs.
- Storm sewers on local roads are to be designed to provide at least a 2-year level of service without any ponding per the City's latest Technical Bulletin PIEDTB-2016-01 using a time of concentration of 10 minutes. However, pipes may be sized larger where required in order to optimize inflow into the minor system (within the maximum allowable inflow rates) and maximize retention of larger rain events on site up to the 100-year event.
- For less frequent storms, the minor system sewer capture will be restricted with the use of inlet control devices (ICDs) to prevent excessive hydraulic surcharges.
- Under full flow conditions, the allowable velocity in storm sewers is to be no less than 0.80 m/s. The preferred maximum velocity is 3.0 m/s, with an allowance of up to 6.0 m/s on an exceptional basis only.
- For the 100-year storm and for all roads, the maximum depth of water (static and/or dynamic) on streets, rear yards, public space and parking areas shall not exceed 0.35 m at the gutter.
- The major system shall be designed with sufficient capacity to allow the excess runoff of a 100-year storm to be conveyed within the public ROW or adjacent to the right-of-way provided that the water level must not touch any part of the building envelope, must remain below all building openings during the stress test event (100-year + 20%), and must maintain 15 cm vertical clearance between spill elevation on the street and the ground elevation at the nearest building envelope.
- When catch basins are installed in rear yards, safe overland flow routes are to be provided to allow the release of excess flows from such areas. A minimum of 30 cm of vertical clearance is required between the rear yard spill elevation and the ground elevation at the adjacent building envelope.
- The product of the maximum flow depths on streets and maximum flow velocity must be less than 0.60 m^2/s on all roads.

© DSEL

5.3.1 Quality Control Targets

An Enhanced Level of Protection (80% total suspended solids removal) per MECP guidelines will be achieved in the Avalon West (N5) SWM Facility.

5.3.2 Quantity Control Targets

Quantity control treatment will be provided in the Avalon West (N5) SWM Facility, which was designed to include the tributary area of the subject site. The SWM Facility has been designed with sufficient storage to match pre-development flows on key points within downstream sections of McKinnon's Creek for the 2, 5, and 100-year 24-hour SCS Type II storms.

ICDs have been proposed within the development to facilitate on-site quantity controls up to the 100-year event while controlling to a maximum of 220 L/s/ha into the minor system. See further discussion in Section 5.7 of this report.

5.4 Proposed Minor System

The subject site will be serviced by a conventional storm sewer system designed in accordance with City of Ottawa standards that is to generally follow the local road network and proposed servicing blocks. There are two proposed storm outlets for the subject site, with both being tributary to the Western Trunk Sewer, which flows to the existing Avalon West (N5) SWM Facility.

The proposed storm sewers are depicted on ***Figure 5 – Storm Servicing Figure***.

Street catch basins located within low points will collect drainage from the streets and front yards, while rear yard catch basins will capture drainage from backyards. Perforated catch basin leads will be provided in rear yards, except the last segment where it connects to the right-of-way which will be solid pipe, per current City standards.

The preliminary rational method design of the minor system captures drainage for storm events up to the 2-year event for local roads, with minor system capture limited to the 5-year event for the Mixed-Use Density Block (or in this case up to the 220 L/s/ha restriction). ICDs will be used in catch basins within the subject property to limit the flows accordingly.

Table 6 summarizes the standards that are being employed in the detailed design of the storm sewer network.

© DSEL

Table 6: Storm Sewer Design Criteria

Design Parameter	Value
Minor System Design Return Period	1:2 year (PIEDTB-2016-01) for local roads, without ponding
Minor System Capture for Mixed-Use Density Block	1:5 year
Major System Design Return Period	100-Year
Intensity Duration Frequency Curve (IDF) 2-year storm event: A = 723.951, B = 6.199, C = 0.810 5-year storm event: A = 998.071, B = 6.053, C = 0.814	$i = \frac{A}{(t_c + B)^C}$
Initial Time of Concentration	10 minutes
Rational Method	$Q = CiA$
Minor System Inflow Rate per Avalon Encore Stage 6 Design	220 L/s/ha
Runoff coefficient for paved and roof areas	0.9
Runoff coefficient for landscaped areas	0.2
Storm sewers are to be sized employing the Manning's Equation	$Q = \frac{1}{n} A R^{2/3} S^{1/2}$
Minimum Sewer Size	250 mm diameter
Minimum Manning's 'n'	0.013
Minimum Depth of Cover	2.0 m from crown of sewer to grade
Minimum Full Flowing Velocity	0.8 m/s
Maximum Full Flowing Velocity	3.0 m/s
Extracted from Sections 5 and 6 of the City of Ottawa Sewer Design Guidelines (October 2012) and PIEDTB-2016-01 (September 6, 2016)	

The paved area and grassed area runoff coefficients of 0.9 and 0.2, respectively, were used to calculate average runoff coefficients that were applied across the site. ***Figure 6*** in the ***Figures*** section of this report has been prepared to illustrate the areas reviewed in order to assess the imperviousness for the development area.

The storm drainage area plans and design sheets for the Avalon Encore Stage 6 design are enclosed in ***Appendix E***. Based on the Atrel design, the following had been provided for the subject site:

<u>Walkway Block at Aquarium Avenue @ Existing MH 6559</u>

- 2.20 ha
- Runoff Coefficient = 0.80
- Time of Concentration = 15 minutes
- Peak Flow (5-Year Intensity) = 408.84 L/s

<u>Sculpin Street @ Existing MH 6608</u>

- 1.96 ha
- Runoff Coefficient = 0.80
- Time of Concentration = 15 minutes
- Peak Flow (5-Year Intensity) = 456.46 L/s

© DSEL

The storm design sheet for the subject site is enclosed in ***Appendix E*** for reference. As summarized in the ***SWM Report*** the detailed design of the storm system results in a drainage area of 2.28 ha to the east Block 28 outlet to Aquarium Avenue and 1.76 ha to the south Sculpin Street outlet. The following table derived from the JFSA Table 2B in the ***SWM Report*** demonstrates the various return period flows for the site modelled and demonstrates 5-Year flows that are comparable or less than the Atrel flows summarized above. The flows do not exceed the 220 L/s/ha constraint therefore there are no adverse impact on downstream developments.

Table 7: Comparison of Minor System Flows (3-Hour Chicago) from Development

Location	DSEL Rational Flow (m^3/s)	2-Year PCSWMM Flow (m^3/s)	5-Year PCSWMM Flow (m^3/s)	100-Year PCSWMM Flow (m^3/s)
MH6559 (East Block 28 Outlet)	0.339	0.307	0.407	0.491
MH6608 (South Sculpin Outlet)	0.190	0.196	0.268	0.384
Taken from JFSA SWM Report Table 2B.				

ICDs have been proposed to ensure that storm flows entering the minor system are limited to the appropriate peak storm flow. Beyond the 2-year capture requirements, ICDs were selected to maximize the use of available road surface storage during the 100-year storm, while still retaining the excess 100-year runoff within road ponding areas of sufficient volume, where grading allowed. In addition, JFSA has prepared Table 1B within the ***SWM Report*** which provides the approximate ponding duration in the various ponding areas (also see the Static Ponding Plan (Drawing 20) for this information. Rear yard catchbasins were connected to catchbasins on the road, where possible, in order to allow rear yard runoff access to the storage in road ponding areas at regular intervals where elevations allowed. For additional details, refer to the ***SWM Report***.

5.5 Block 27 Storm Service

A storm control manhole (STM Control MH 100) has been provided to Block 27 to facilitate a future servicing outlet for that property parcel to the north of the Cassette Subdvision. The stormwater modelling and details for on-site stormwater management will be developed for the parcel when a site plan application is advanced for that area in future. The control manhole will have a knockout provided for the future connection when the design for that area is advanced.

In terms of the minor system outlet provided within the Cassette Subdivision design, the site area of ~0.68 ha generates a minor system flow of up to 149.6 L/s based on the governing 220 L/s/ha. The provided 525mm diameter storm sewer at a design grade of 0.25% provides an outlet capacity of 224 L/s which is sufficient for future service.

© DSEL

5.6 Hydraulic Grade Line Analysis

Refer to Table 3 within the ***SWM Report*** for a detailed hydraulic grade line (HGL) modelling analysis for the proposed system, for the 100-year 3-hour Chicago storm, 100-year 24-hour SCS Type II storms. A minimum freeboard of 0.30 m between the HGL and the underside of footing elevations (minimum of 0.45m) has been provided throughout the proposed development for the 100-year storms and a minimum freeboard of 0 m has been provided throughout the development for the historical events.

5.7 Proposed Major System

Major system conveyance, or overland flow (OLF), will be provided to accommodate flows in excess of the minor system capacity. OLF is accommodated by generally storing stormwater up to the 100-year design event in road sags then routing additional surface flow along the road network towards the proposed outlets, as shown on the grading plan for the site. The 100-year flows on the Mixed-Use Density Block will be required to be controlled on site.

The site has three major system emergency outflow locations from the development area:

1. West along Broadcast Avenue to Mer-Bleue Road;
2. South to Sculpin Street; and
3. East to the Avalon Encore development area via a walkway/servicing block.

As noted in the ***SWM Report*** there are minor spills from the site (ranging from 0.2% to 0.5% of total runoff depending on the storm event) as the 100-year event is approached for the Mer-Bleue Road and Sculpin Street outlets. Given the minor nature of the spill, optimized surface storage, and minor system intakes up to the 220 L/s/ha restriction, it is requested that this excess spill be deemed acceptable given the minor nature of the exceedance.

5.8 Stormwater Conclusions

The storm outlet for the subject site is the Avalon West (N5) SWM Facility, which treats the flows for quantity and quality control before discharging to McKinnon's Creek. The adjacent Avalon Encore Stage 6 was designed with capacity for the subject site and will convey flows to the SWM Facility via the Western Trunk.

The minor system inflow rate shall be limited to the 220 L/s/ha with a time of concentration of 10 minutes. The sewer outlets from the development are located at the walkway/servicing Block 28 to Aquarium Avenue and at Sculpin Street. Both outlets were designed to convey a flow that is in keeping with the projected flows generated by the current design. As such, there is sufficient capacity in the downstream storm system. A hydraulic grade line analysis has been completed to confirm that 0.30 m freeboard between the estimated underside of footing elevations and the 100-year hydraulic gradeline is provided throughout the subject site.

© DSEL

The minor system is designed to capture the 2-year event (or more, up to the 220 L/s/ha rate, depending on requirements to minimize overland flow from the site) for local roads and minor system capture for the mixed-use density block to be limited to the 5-year event (or up to 220 L/s/ha, whichever governs).

Major system conveyance is provided to accommodate flows in excess of the minor system capacity, generally accommodated by storing stormwater up to the 100-year design event in road sags, then routing additional surface flow along the road network to the proposed outlets.

The storm sewers have been designed in accordance with the City of Ottawa and MECP standards.

© DSEL

6.0 SITE GRADING

6.1 Master Grading

The subject site is constrained by grade raise restrictions, downstream infrastructure and existing grades on surrounding properties and roads.

The site is subject to grade raise restrictions between 88.6 m to 89.2 m based on the information provided in the ***Geotechnical Investigation*** by Paterson Group, dated March 10, 2021.

Proposed grades for the site have been designed to be as low as possible based on grade raise restrictions, servicing constraints and existing surrounding properties.

Detailed grading plans will be forwarded to the geotechnical consultant for review and recommendations.. Final signoff for detailed grading plans will be provided by the Geotechnical Engineer.

6.2 Grading Criteria

The following grading criteria and guidelines have been applied as per City of Ottawa Guidelines:

- Driveway slopes will have a maximum slope of 6%;
- Grading in grassed / landscaped areas to range from 2% to 3:1, with terracing required for flops larger than 7%;
- Swales are to be 0.15 m deep with 3:1 side slopes unless otherwise indicated on the drawings;
- Perforated pipe will be required for drainage swales if they are less than 1.5% in slope; and
- Swales are to be 0.15 m deep with 3:1 side slopes unless otherwise indicated on the drawings.

© DSEL

7.0 EROSION AND SEDIMENT CONTROL

Soil erosion occurs naturally and is a function of soil type, climate and topography. The extent of erosions losses is exaggerated during construction where the vegetation has been removed and the top layer of soil is disturbed.

Prior to topsoil stripping, earthworks or underground construction, erosion and sediment controls will be implemented and will be maintained throughout construction.

The installation, monitoring and reporting of all sediment and erosion control measures are to be completed in accordance with regulations from the Ministry of the Environment, Conservation and Parks (MECP) and South Nation Conservation Authority (SNCA).

Erosion and sediment control details for monitoring, maintenance, spills control and sequence of activities are included on **Drawing 21 – Erosion and Sediment Control Plan Stage 1** and **Drawing 22 – Erosion and Sediment Control Plan Stage 2**.

Erosion and sediment controls must be in place during construction. The following recommendations to the contractor are shown on the erosion and sediment control drawings and will be included in contract documents:

- Limit extent of exposed soils at any given time.
- Re-vegetate exposed areas as soon as possible.
- Minimize the area to be cleared and grubbed.
- Install silt fence to prevent sediment from entering existing ditches.
- Install mud mat at the accesses to prevent mud tracking onto adjacent roads.
- No refueling or cleaning of equipment near existing watercourses.
- Provide sediment traps and basins during dewatering.
- Install Terrafix Siltsack (or approved equivalent) between standard catch basins and frames.
- Install Filtrexx Siltsoxx (or approved equivalent) in curb inlet catch basins grate.
- Install straw bale barriers in downstream ditches per OPSD 219.180.
- Install rock flow check dams in proposed temporary cut off swales within the site per OPSD 219.210.
- Plan construction at appropriate timing to avoid flooding.
- Establish material stockpiles away from watercourses, so that barriers and filters may be installed.

The plans are intended to assist the contractor during layout and construction of the siltation control features only.

8.0 UTILITIES

Utility servicing will be coordinated with individual utility companies prior to site development.

© DSEL

9.0 CONCLUSION AND RECOMMENDATIONS

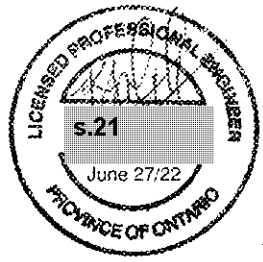
A summary of the Design Brief for the Cassette Subdivision (2275 Mer-Bleue Road) is as follows:

- Approvals will be required from the City of Ottawa and MECP.
- The adjacent Minto Avalon Encore Subdivision was designed with capacity for the subject site, which is now proposed as residential and a mixed-use block (anticipated to be residential mid-rise with main floor commercial in future).
- Water supply is provided by connections to existing 200 mm watermains via a walkway/servicing Block 28 to Aquarium Avenue and via Sculpin Street as well as to the existing 400 mm watermain within Mer-Bleue Road.
- A detailed hydraulic analysis has been completed by Stantec to confirm that the proposed water network can deliver all domestic and fire flows as per the MECP, City of Ottawa and FUS criteria.
- Sanitary flows are proposed to discharge at two locations within Avalon Encore Stage 6 – to the Block 28 to Aquarium Avenue and to Sculpin Street. The adjacent site was designed to convey flows from the subject site.
- Within the timeframe following the design for the adjacent development areas was completed, the City of Ottawa has updated their design guidelines per ISTB-2018-01 (March 21, 2018). The sanitary flows projected from the site are in line with the FSR and are slightly higher than those anticipated in prior adjacent designs. However, with review of the downstream design sheets in ***Appendix D***, it is confirmed that there is sufficient residual capacity in the downstream infrastructure.
- The design has regard for the 100-year emergency HGL from the Tenth Line Pump Station overflow. The design will provide 0.30 m freeboard from the sanitary HGL.
- The storm outlet for the subject site is the Avalon West (N5) SWM Facility, which treats the flows for quantity and quality control before discharging to McKinnon's Creek. The adjacent Avalon Encore Stage 6 was designed with capacity for the subject site and will convey flows to the SWM Facility via the Western Trunk.
- The minor system inflow rate shall be limited to a maximum of 220 L/s/ha with a time of concentration of 10 minutes. The two outlets are located at the walkway/servicing Block28 to Aquarium Avenue and at Sculpin Street. Both outlets were designed to convey a larger flow than was generated by the current design. As such, there is sufficient capacity in the downstream storm system.
- The minor system is designed to capture the 2-year event for local roads and minor system capture for the mixed-use density block to be limited to the 5-year event (up to the 220 L/s/ha capture limitation).
- An HGL analysis has been completed to confirm that the underside of footing elevations are provided with 0.30 m freeboard from the 100-year HGL elevation.

© DSEL

- Major system conveyance will be provided to accommodate flows in excess of the minor system capacity, generally accommodated by generally storing stormwater up to the 100-year design event in road sags, then routing additional surface flow along the road network to the proposed outlets.
- The site is subject to a grade raise restriction of 1.5 to 1.7 m. Detailed grading plans will be reviewed by a geotechnical engineer and recommendations will be made, as required.
- Erosion and sediment control measures will be implemented and maintained throughout construction. Adjacent properties and watercourses will be protected from any negative impacts from construction.
- The design for 2275 Mer-Bleue Road has been completed in general conformance with the City of Ottawa and MECP Design Guidelines and criteria presented in other background study documents.

Prepared by,
David Schaeffer Engineering Ltd.



Per: Kevin L Murphy, P.Eng.

© DSEL
20220623_mer_bleue_2nd_subm_final.docx

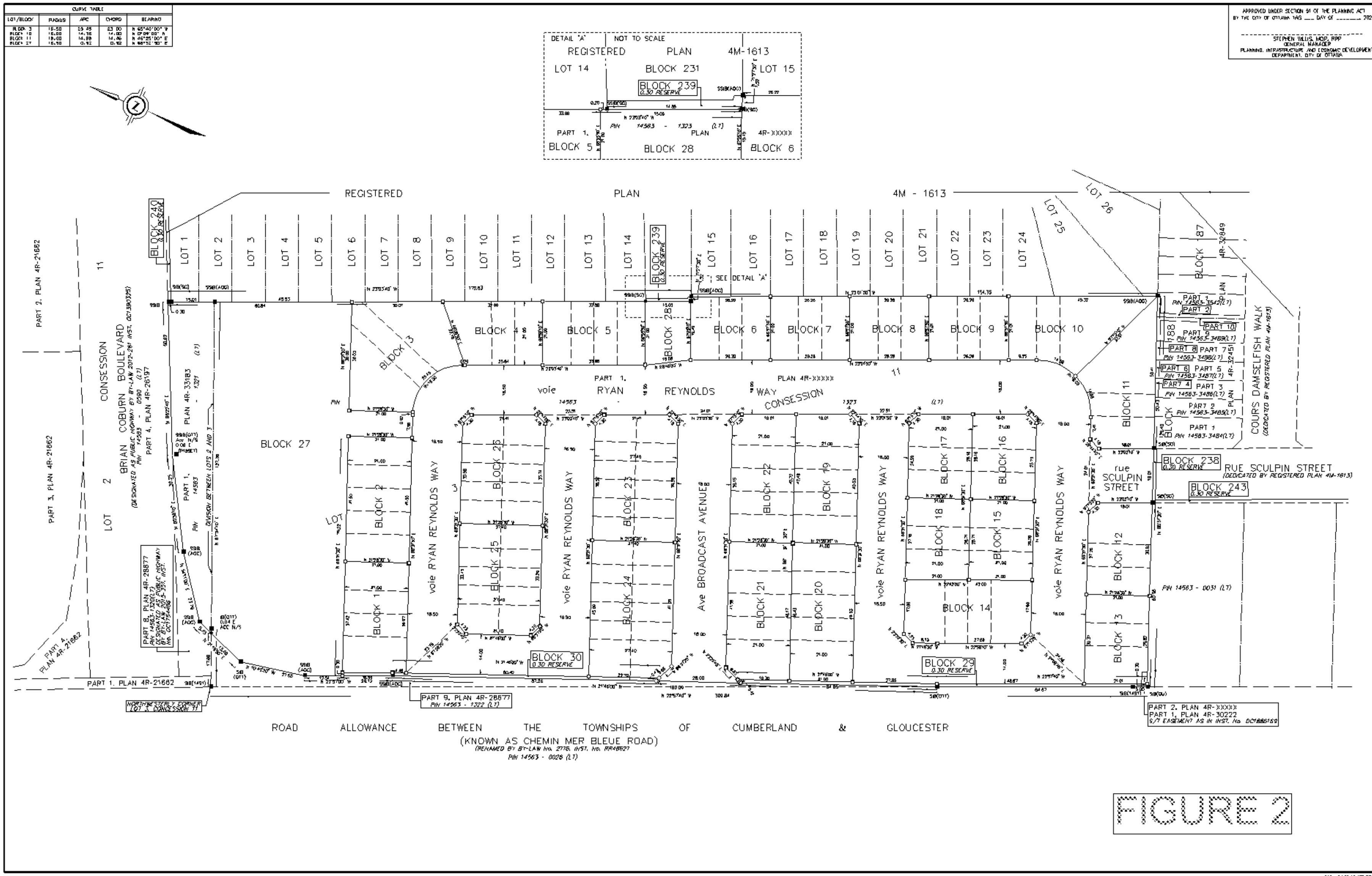
FIGURES

LEGEND

SITE BOUNDARY

2275 MER BLEUE ROAD	SITE LOCATION	DATE: MAY 2022
		SCALE: 1:15000
		PROJECT No.: 20-1214
		FIGURE: 1

DSEL
david schaeffer engineering ltd
120 Iber Road, Unit 203
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca



APPROVED UNDER SECTION 51 OF THE PLANNING ACT BY THE CITY OF OTTAWA THIS ___ DAY OF _______ 2022

STEPHEN WILLIS, MCIP, RPP
GENERAL MANAGER
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA

PLAN 4M-

I CERTIFY THAT THIS PLAN IS REGISTERED IN THE LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON (No. 4) AT_________ O'CLOCK ON THE _____ DAY OF__________, 2022 AND ENTERED IN THE PARCEL REGISTER FOR PROPERTY IDENTIFIER ______________

AND THE REQUIRED CONSENTS ARE REGISTERED AS PLAN DOCUMENT No. ______________________

LAND REGISTRAR

THIS PLAN COMPRISES ALL OF PINS 14563-1321(LT) AND 14563-1323(LT)

PLAN OF SUBDIVISION OF PART OF LOTS 2 AND 3 CONCESSION 11 (GEOGRAPHIC TOWNSHIP OF CUMBERLAND) NOW IN THE CITY OF OTTAWA

SCALE 1 : 500

J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

OWNER'S CERTIFICATE - PLAN OF SUBDIVISION

THIS IS TO CERTIFY THAT:

1. BLOCKS 1 TO 28 BOTH INCLUSIVE, THE STREETS NAMELY: Rue SCULPIN STREET, avenue BROADCAST AVENUE, AND voie RYAN REYNOLDS WAY, AND THE 0.30m RESERVES NAMELY BLOCKS 29 TO 30 BOTH INCLUSIVE, HAVE BEEN LAID OUT IN ACCORDANCE WITH OUR INSTRUCTIONS.
2. THE STREETS ARE HEREBY DEDICATED TO THE CITY OF OTTAWA AS PUBLIC HIGHWAYS.

DATED THIS________DAY OF_________202_

Coivan (Mer Bleue) Inc.

FRANK CAIRO
(PRESIDENT)
"I HAVE THE AUTHORITY TO BIND THE CORPORATION"

NOTES

BEARINGS ARE XTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS (SCPs) XXXXXXXXXX AND XXXXXXXXXX, XTM ZONE XX, NAD83 (ORIGINAL)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999967.

INTEGRATION DATA		
SPECIFIED CONTROL POINTS (SCPs): MTM ZONE 09, NAD83 (ORIGINAL)		
COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF O.REG 216/10.		
POINT ID	EASTING	NORTHING
SCP XXXXXXXXXX	XXX XXX.XX	4 XXX XXX.XX
SCP XXXXXXXXXX	XXX XXX.XX	4 XXX XXX.XX
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

THE RESULTANT TIE BETWEEN SCP (A) AND SCP (B) IS XXX.XX N XX°XX'XX" E

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
PB	DENOTES	PLASTIC BAR
WIT	DENOTES	WITNESS
MEAS	DENOTES	MEASURED
JDB	DENOTES	J.D. BARNES LIMITED
AOG	DENOTES	ANNIS, O'SULLIVAN, VOLLEBEKK LTD
SG	DENOTES	STANTEC GEOMATICS
CIT	DENOTES	CITY OF OTTAWA
1491	DENOTES	D. DUTRISAY, O.L.S.

ALL SET SSIB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91

SURVEY MONUMENTS PLANTED ARE IRON BARS UNLESS OTHERWISE NOTED.
DISTANCES SHOWN ON CURVED LIMITS ARE ARC MEASUREMENTS.
SURVEY MONUMENTS FOUND ARE J.D. BARNES LIMITED UNLESS OTHERWISE NOTED.
RESERVE BLOCKS EXAGGERATED FOR CLARITY

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON 202_.

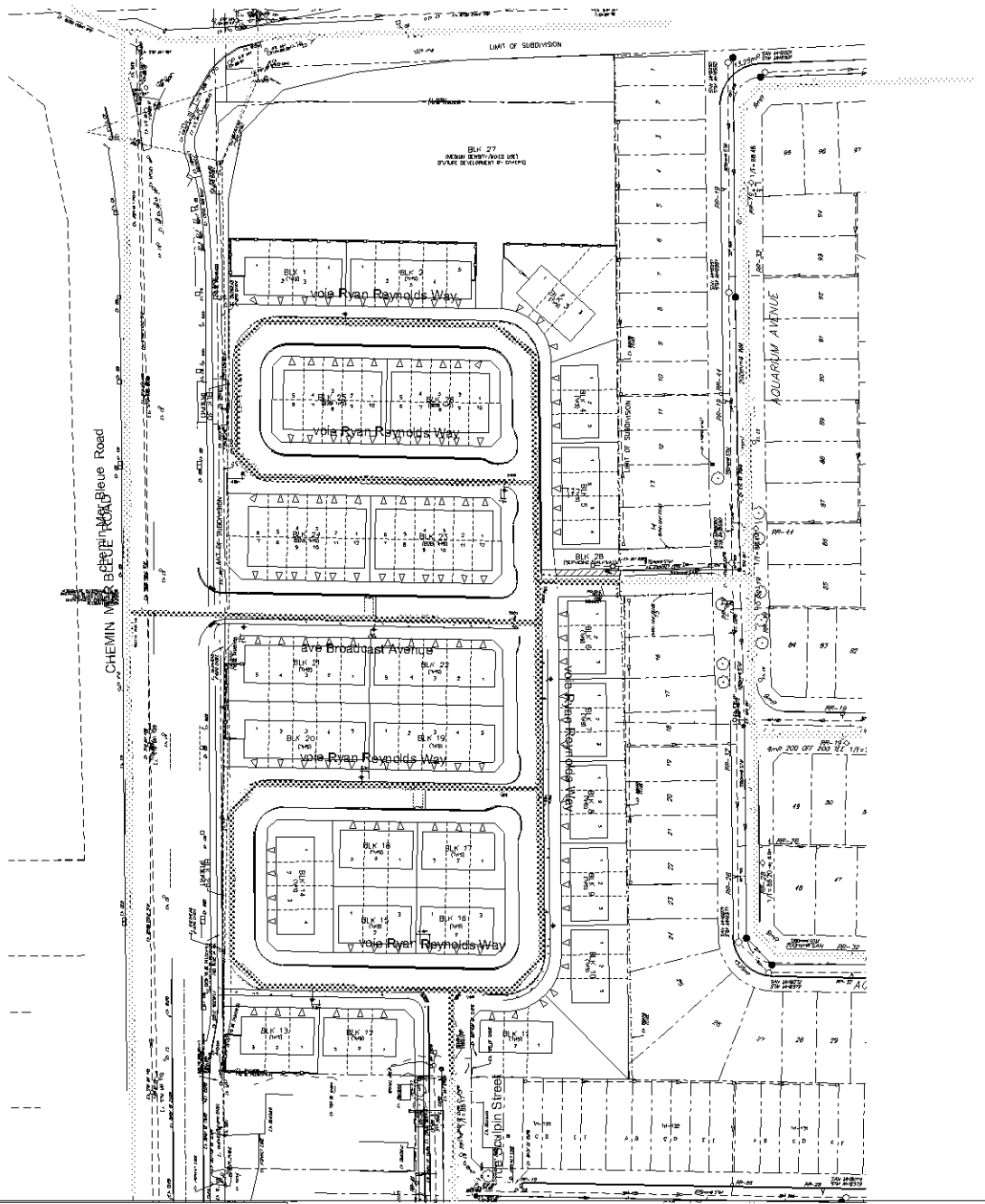
DATE

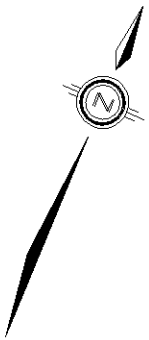
C.M. FOX
ONTARIO LAND SURVEYOR

J.D. BARNES LIMITED
LAND INFORMATION SPECIALISTS

DRAWN BY: CC	CHECKED BY: CF	REFERENCE NO.: 20-10-178-00 V5.0
PLOTTED: 3/15/22		DATED: 03/05/22

000031





LEGEND

- CROSS
- 45° BEND
- LATERAL
- HYDRANT, VALVE & VB
- TEE
- VALVE & VC
- VALVE & VB
- 22.5° BEND
- 11.25° BEND
- REDUCER
- CAP

PROPOSED WATERMAIN

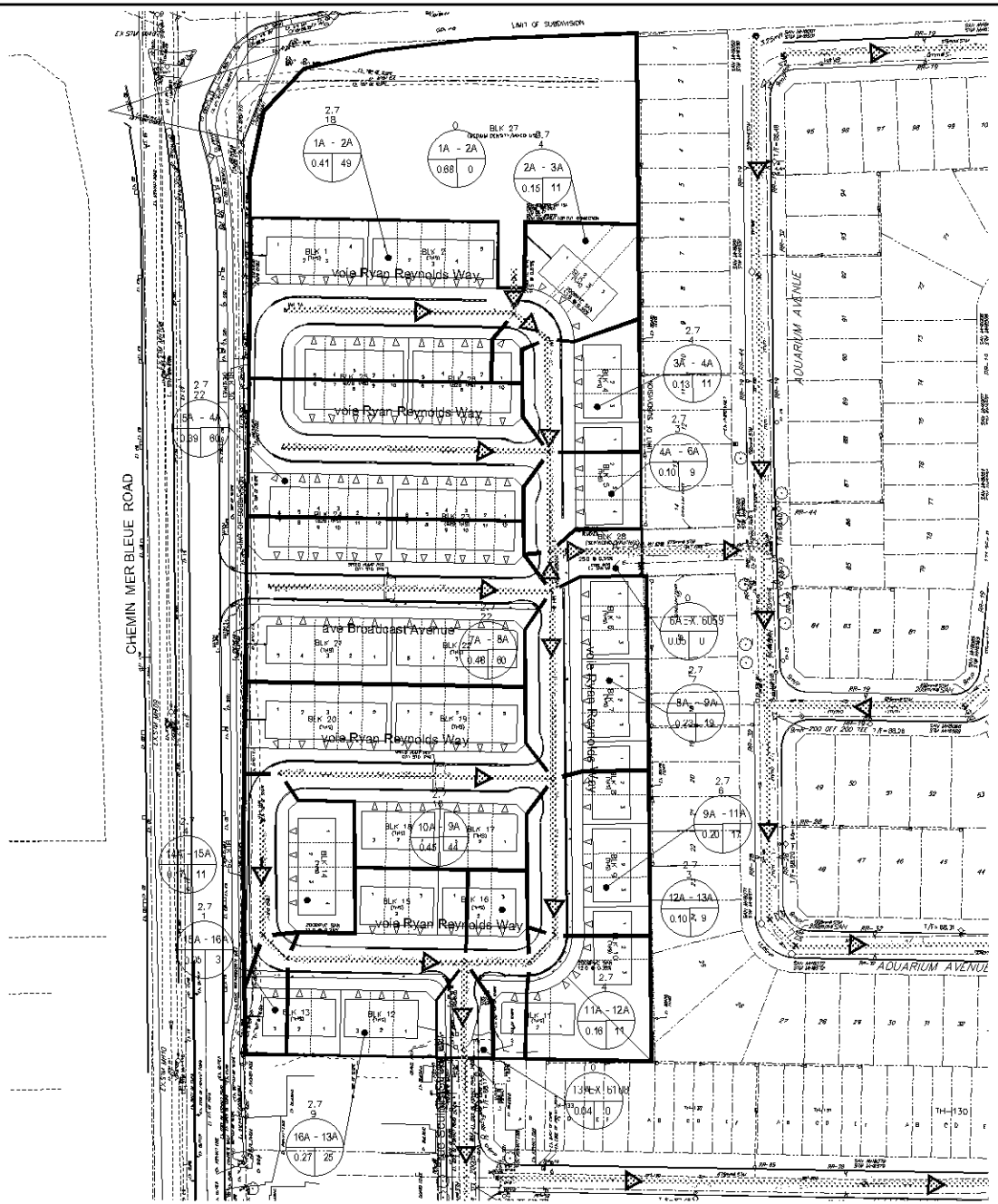
EXISTING WATERMAIN

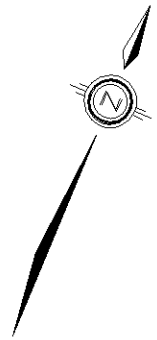
DSEL
120 Iber Road, Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

CAIVAN (MER BLEUE) INC. - CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

CITY OF OTTAWA

WATERMAIN SERVICING FIGURE			
SCALE:	1:500	PROJECT No.:	20-1214
DATE:	MAY 2022		FIGURE 3





LEGEND

- SANITARY DRAINAGE BOUNDARY
- SANITARY SUB-DRAINAGE BOUNDARY
- SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
- UPSTREAM MH TO DOWNSTREAM MH / AREA IN HECTARES / POPULATION — 43A - 44A | 0.78 | 61
- UPSTREAM MH TO DOWNSTREAM MH / AREA IN OTHER PHASES IN HECTARES / POPULATION — 43A - 44A | 0.78 | 61
- EXTERNAL AREA IN HECTARES — A=53.63
- EXTERNAL POPULATION / DENSITY (PERSONS/HECTARE) — 107 | POP=5739
- EXTERNAL LAND USE — RESIDENTIAL
- MAINTENANCE HOLE — MH202A
- CAP
- EXISTING SANITARY MAINTENANCE HOLE

PROPOSED SANITARY SEWER

EXISTING SANITARY SEWER

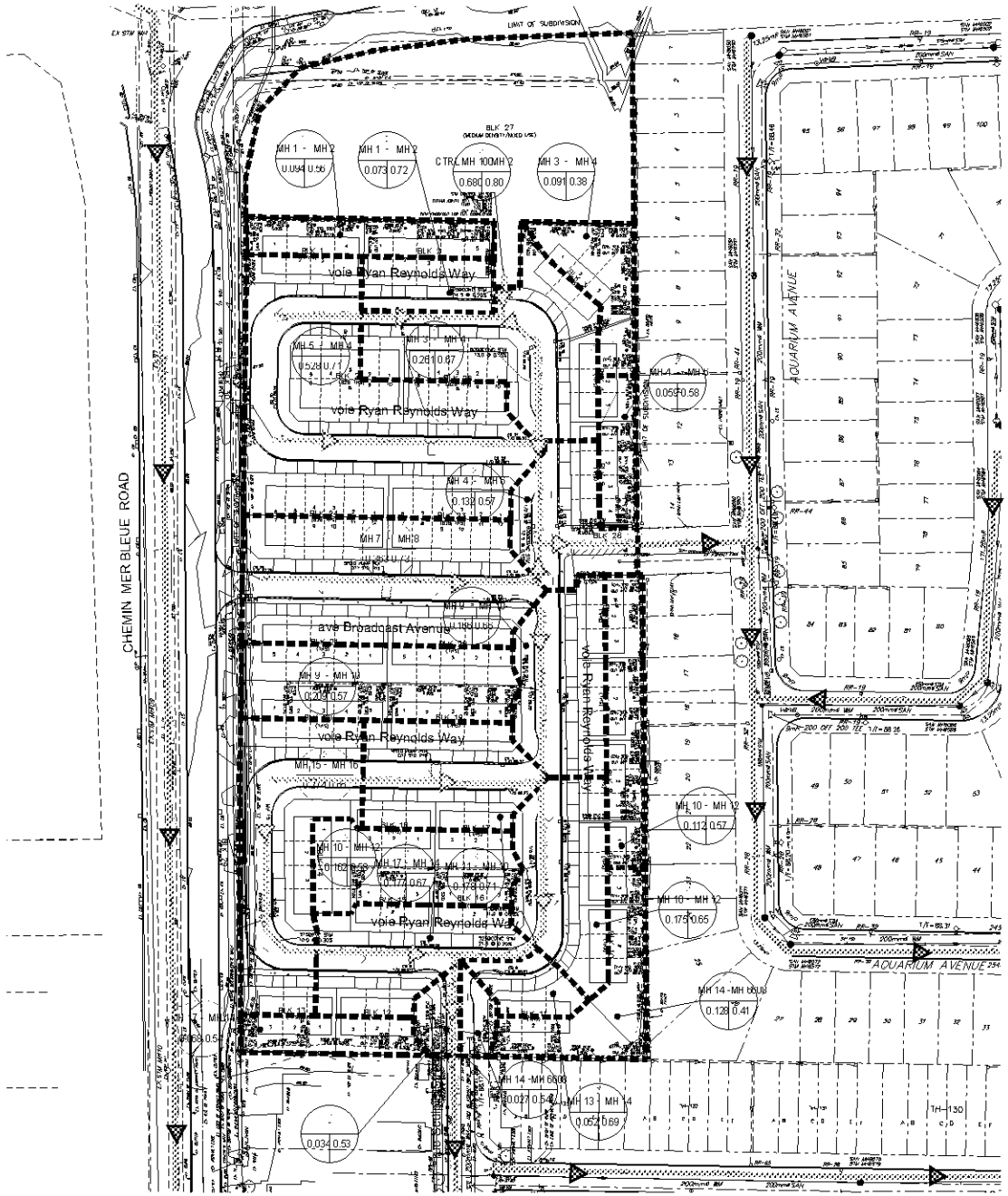
DSEL
120 Iber Road, Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

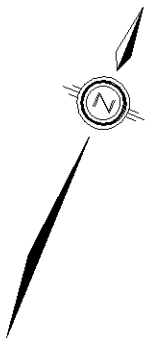
CAIVAN (MER BLEUE) INC. - CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

CITY OF OTTAWA

SANITARY SERVICING FIGURE

SCALE:	1:500	PROJECT No.:	20-1214
DATE:	MAY 2022		FIGURE 4





LEGEND

- STORM DRAINAGE BOUNDARY
- SUB-DRAINAGE BOUNDARY
- STORM DRAINAGE BOUNDARY (OTHER PHASES)
- STORM FREQUENCY
- UPSTREAM MH TO DOWNSTREAM MH (2YR: 43 - 44)
- AREA IN HECTARES (0.37 | 0.51)
- RUNOFF COEFFICIENT
- EXTERNAL 2.78AC = (2.78AC=14.40)
- EXTERNAL TIME OF CONCENTRATION (TC=14.5 MIN)
- EXTERNAL BLENDED RUNOFF COEFFICIENT (C= 0.70 | 2YR)
- EXTERNAL STORM FREQUENCY
- UPSTREAM MH TO DOWNSTREAM MH (21-23)
- AREA IN OTHER PHASES IN HECTARES (0.28 | 0.78)
- RUNOFF COEFFICIENT
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD MAINTENANCE HOLE (MH202)
- CURB INLET CATCHBASIN & LEAD CATCHBASIN / MAINTENANCE HOLE (CBMH201)
- INTERCONNECTED CATCH BASIN & LEADS
- CAP
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EXISTING STORM MAINTENANCE HOLE

PROPOSED STORM SEWER

EXISTING STORM SEWER

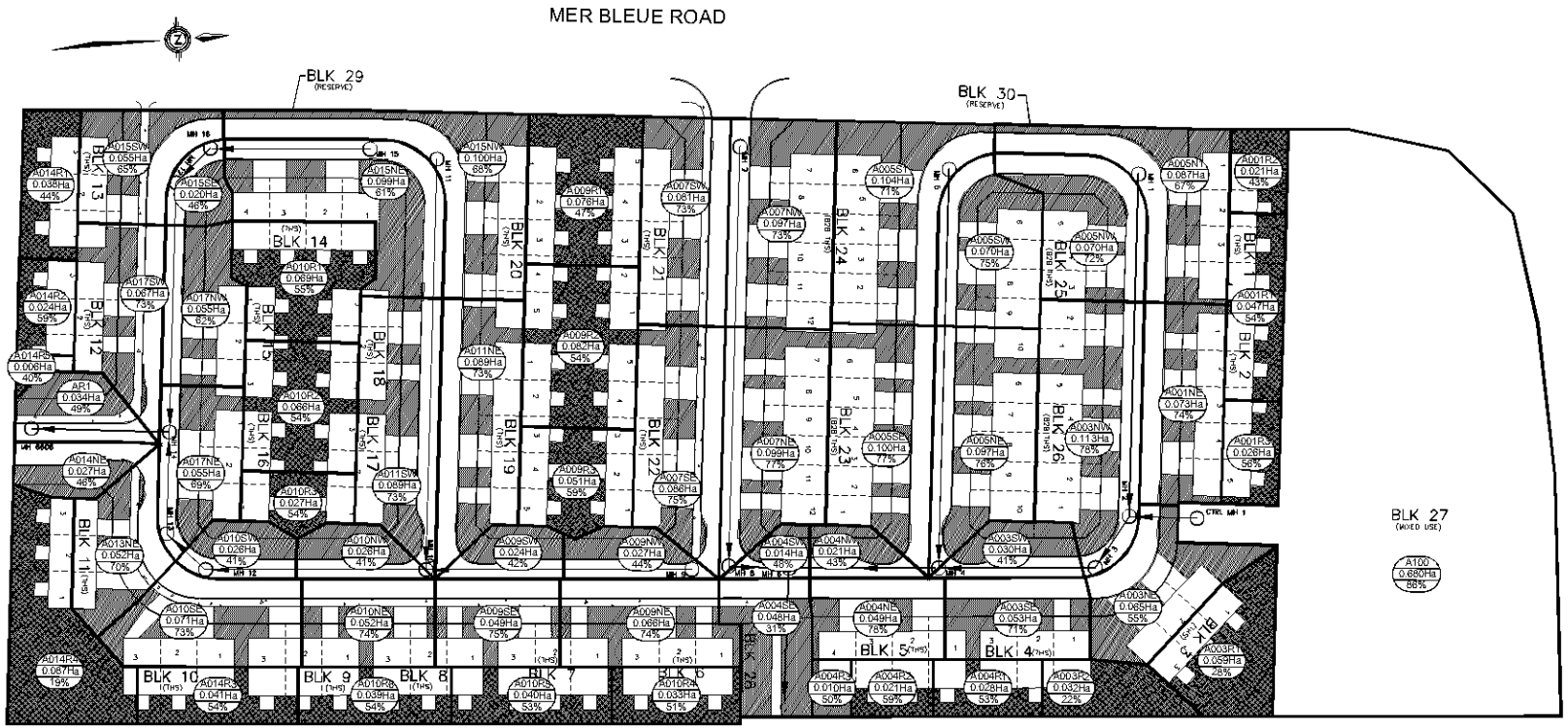
DSEL
120 Iber Road, Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

CAIVAN (MER BLEUE) INC. - CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

CITY OF OTTAWA

STORM SERVICING FIGURE

SCALE:	1:500	PROJECT No.:	2U-1214
DATE:	MAY 2022		FIGURE 5



120 Iber Road, Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

CAIVAN (MER BLEUE) INC. - CASSETTE SUBDIVISON (2275 MER BLEUE ROAD)

CITY OF OTTAWA

IMPERVIOUSNESS HATCH FIGURE

SCALE:	1:1000	PROJECT No.:	20-1214
DATE:	MAY 2022	FIGURE:	FIGURE 6

APPENDIX A

Pre-Consultation and Existing Approvals

Anton Udaltsov

7 - PRE-CONSULTATION MINUTES by City of Ottawa (September 30, 2020)

From: Belan, Steve <Steve.Belan@ottawa.ca>
Sent: September 30, 2020 5:41 PM
To: Hugo Lalonde; Julie Carrara
Cc: Steve Pichette; Mark Crockford; Andrew Harte
Subject: Pre-con Follow-up - 2275 Mer Bleue
Attachments: Mer Bleue 2275_UD Comments PRE1.docx; Pre-con comments_MerBleue.docx; AODA Checklist.docx; TIA Screening Form.pdf; 170401-S5.pdf; 170401-S4.pdf; 20-09-18_SK-02_Concept_2063.pdf; tree_sensitive_soil_guide_en.pdf

Hello Hugo

Please refer to the below [and/or attached notes] regarding the Pre-Application Consultation (pre-con) Meeting held on September 22, 2020 for the property at 2275 Mer Bleue Road for Major Rezoning/Subdivision in order to allow the development of subdivision consisting of new public streets with street townhouse unit and back to back units and a future mixed-used development block by Caivan Homes. I have also attached the required Plans & Study List for application submission.

Below [and attached] are staff's preliminary comments based on the information available at the time of pre-con meeting:

Planning

- The area is General Urban Area in the OP and a Commercial and Commercial/Residential in the Mer Bleue Community Design Plan
- After reviewing the Mer Bleue Community Design Plan I don't believe that an amendment to the plan as this proposal dose not change the number of high density residential block, change the location of the road or infrastructure network or remove an identified park.
- Zoning amendment will be necessary to rezone a large segment of the property to Residential uses and re-delineate where the mixed-use area will start.
- Subdivision application to create the public streets and development blocks.
- Applicant must now provide a proposed strategy for public consultation as directed by Bill 73
- Planning has concerns that the northern mixed-use (MU) block is being made too small. The three townhouse blocks abutting the MU block overlaps the existing street access to Mer Bleue. The removal of this access would limit the flexibility to develop the MU block.
- Planning will not support 16.5 m ROW in this new development. 18 metre right of ways are to be designed in.
- Window streets are not a preferred option by the City. Dwelling units facing Mer Bleue with a back lane would be preferred.
- The east assess to Aquarium is only wide enough for a pedestrian link. An equal size block will need to line up with this block on your development.
- Would like a more refined concept of how to develop the MU block I think that medical offices could work with the health hub to the north. Could be developed like the offices along CenterPoint Drive.

Urban Design

- Please refer to the attached comments

Engineering

The attached "Pre-application consultation servicing memo" summarizes engineering design considerations as per our discussion. [Ensure the memo addresses all relevant engineering issues.]

Submission Requirements

1. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:

   Location of service connections (MAP)
   Type of development and the amount of fire flow required (as per FUS).
   Average daily demand: ___ l/s.
   Maximum daily demand: ___l/s.
   Maximum hourly daily demand: ___ l/s.

3. Required Plans and Reports:
   Submission:

   Draft Plan of Subdivision
   Concept Plan Showing Proposed Land Uses and Landscaping
   Planning Rationale
   Draft Streetscaping Plan
   Archaeological Resource Assessment (to satisfy a condition of draft approval/approval)
   Topographical Plan of Survey with a published bench mark
   Grading & Drainage Plan
   General Plan of Services
   Erosion & Sediment Control Plan
   Composite Utility Plan
   Design Brief and Stormwater Management Report
   Geotechnical Report
   Stationary Noise Study
   TIA
   TCR memo
   Phase 1 ESA
   Phase 2 ESA (if recommended by the Phase 1)

4. Storm Design
   The "Mer Bleue Community Design Plan Infrastructure Servicing Study" and "Avalon West (Neighbourhood 5), Stormwater Management Facility Design Report" prepared by IBI Group recommends that the storm water be conveyed to the existing Storm Water Management (SWM) Basin located south of Neighbourhood 5. N5 SWM Pond.

   Design Constraints
   The main storm drainage design constraints can be summarized as follows:

   Minor System
   i. Storm sewer designed using the rational formula for the 5 year storm using a time of concentration of 10 minutes.
   ii. The inflow rate into the minor system shall be limited to 220 L/s/ha, as per IBI's report.
   iii. Arterial roads area shall be restricted to a 1:10 year storm and a 10 minute inlet time which represents 238 l/s/ha according to IBI's report.

   Major System

On street routing and storage area must be provided and illustrated on the grade control plan. This routing must incorporate a maximum 0.35m flow depth on street under either static or dynamic conditions.

Some site Release Rates are currently in place, shown on these plans as 86 L/s via block 231 and Sculpin Street at 76.5 L/s. 162.5 L/s maximum RR.

5. Minimum Drawing and File Requirements- All Plans
Plans are to be submitted on standard A1 size (594mm x 841mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400, or 1:500).
With all submitted plans provide an individual PDF of the plans unlocked and flattened.
Reports: please provide one complete PDF file of each reports.

*****Note that Mer Bleue and Brian Coburn has no sanitary sewer in available.

Feel free to contact Infrastructure Project Manager, [xx], at [contact information], for follow-up questions.]

Transportation

- Please see the attached comments
- A TIA and Noise Study will be required
- ROW are typically 14.5m for Window streets and 18 m for locals
- The proximity of the access to the roundabout will need further review.

Feel free to contact Transportation Project Manager, [xx], at [contact information], for follow-up questions.

Parkland

- Parkland dedication /Cash-in-lieu of parkland will be based on unit counts and parkland contributions made by the surrounding subdivisions.

Conservation Authority

- The South Nation Conservation Authority will be reviewing the application stormwater quality and quantity criteria.

Other

- Other concerns or notes
- You are encouraged to contact the Ward Councillor, Councillor xx, at [email] about the proposal.

Please refer to the links to "Guide to preparing studies and plans" and fees for further information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact me if you have any questions.

Regards,

Steve Belan

Steve Belan, MCIP, RPP

Planner Planning Services, Development Review Services
Planning, Infrastructure and Economic Development
City of Ottawa / Ville d'Ottawa
110 Laurier Avenue West, 4th Floor / 110, avenue Laurier Ouest, 4e étage
Ottawa, ON K1P 1J1
Telephone / tél.: 613-580-2424 ext./poste 27591
E-mail / courriel: Steve.Belan@ottawa.ca

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'

2275 Mer Bleue – City of Ottawa Planner: Steve Belan Urban Design Comments - Pre-consultation

Christopher Moise OAA MRAIC
Architect | Urban Designer
City of Ottawa

Comments

- Please refer to the CDP and provide a rationale to any changes proposed;
- The CDP also has extensive design guidelines associated with all aspects of this proposal so we expect that as the design develops these guidelines will be implemented;
- We can provide additional design review and guidance as more information is provided and the design develops.

This is an exciting project in an area full of potential. We look forward to helping you achieve its goals with the highest level of design resolution. We are happy to assist and answer any questions regarding the above. Good luck.

My pre-consultation notes are as follows:

- Follow Traffic Impact Assessment Guidelines
    - Screening form (attached), Screening form will have to be reviewed by the Transportation Project Manager. After review and if, any trigger is satisfied, TIA will be required.
    - Start this process as soon as possible.
    - Applicant advised that their application will not be deemed complete until the submission of step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
    - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
- Geometric Road Design (GRD) drawings will be required with the first submission of underground infrastructure and grading drawings. These drawings should include such items as, but is not limited to:
    - Road Signage and Pavement Marking for the subdivision;
    - Intersection control measure at new internal intersections; and
    - Location of depressed curbs and TWSIs;
    - More details can be provided upon request
- Residential streets (local and collector) are to be designed for 30 kph speed limits (posted)
- Ensure the roads are designed in accordance with the traffic calming and collector road guidelines (if applicable).
- Site triangles at the following locations on the final plan will be required:
    - Collector Road to Arterial Road: 5 metre x 5 metres
- Noise Impact Studies required for the following:
    - Road
    - Stationary (if there will be any exposed mechanical equipment due to the proximity to neighbouring noise sensitive land uses)
- On site plan:
    - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
    - Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
    - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
    - Show lane/aisle widths.
    - Sidewalk is (not) to be continuous across access as per City Specification 7.1.
- The City recommends development on private property be in accordance with the City's Accessibility Design Standards (see attached Site Plan Checklist, which summarizes AODA requirements). As the proposed site is commercial/institutional/industrial and for general public use, AODA legislation applies.

- The City recommends development on private property be in accordance with the Accessibility Design Standards (AODA legislation). As the site proposed is residential, it is suggested that the design conforms to the Site Plan Checklist, which summarizes AODA requirements (attached).

Site Plan Checklist – City of Ottawa Accessible Design Standards

1. Accessible Parking Spaces

The terms Type A and Type B Parking Spaces have the same meaning as within O. Reg. 191/11.

This section applies to:

1) *Parking garages and related structures*
2) *Surface parking*
3) *On-street parking*

Standard Ref.	Requirements	Compliance	Comments
3.1.1.	**Provision:** 1 Type A accessible parking space must be provided where there are 12 or fewer spaces (see Table 3 for a complete list)	Y N N/A	
3.1.2	**Provision:** 4% of the total number of parking spaces should be accessible	Y N N/A	
3.1.2	**Provision:** if the total number of spaces is greater than 1001, provide 11 accessible parking spaces plus an addition 1% of the total number of spaces	Y N N/A	
3.1.3	**Access Aisle:** minimum of 1.5 m (see Figure 25)	Y N N/A	
3.1.3	**Location:** a maximum of 30 m from nearest accessible entrance	Y N N/A	
3.1.3	**Surface:** firm, stable and slip resistant	Y N N/A	
3.1.3	**Running slope:** maximum of 1:50 (2%)	Y N N/A	
3.1.3	**Cross slope:** maximum of 1:50 (2%)	Y N N/A	
3.1.3	**Type A spaces:** Length 5.2 m Width 3.4 m Type B spaces Length: 5.2 m Width: 2.4 m	Y N N/A	
3.1.3	**Overhead clearance:** minimum of 2.1 m	Y N N/A	
3.1.3	**Access Aisle:** minimum of 1.5 m. Must be clearly marked and adjacent to accessible parking space	Y N N/A	
3.1.4.1	**Vertical Signage:** **Width:** 0.3 m **Height:** 0.6 m (minimums)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

	Mounted: 1.5 m to 2.0 m high at centre • Marked with International Symbol of Accessibility (see Figure 25)		
3.1.4.2	**Pavement Markings** • Marked with the International Symbol of Accessibility • 15.25 m wide by 15.25 m deep • Locate near the back of the space for 90 degree or angled parking spaces • Locate in the centre for parallel parking spaces (see Figure 27)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

2. Passenger Loading Zone			
Standard Ref.	Requirements	Compliance	Comments
3.2.1	**Location:** maximum of 30 m from nearest accessible entrance	Y N N/A	
3.2.1	**Side Access Aisle** **Length:** 7.4 m **Width:** 2.4 m (minimums) (see Figure 28)	Y N N/A	
3.2.1	**Vertical Clearance:** 3.6 m	Y N N/A	
3.2.1	**Path of Travel:** minimum of 1.8 m wide to nearest accessible entrance	Y N N/A	
3.2.1.1	**Vertical Signage** **Width**: 0.3 m by 0.6 m **Mount:** 1.5 m to 2.0 m high at centre (see Figure 29)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

3. Exterior Paths of Travel

Where stairs are located on an accessible exterior route or walkway, an alternative accessible route is to be provided immediately adjacent to the stairs.

This section applies to:
1) *Pedestrian routes that serve facility entrances*
2) *Pedestrian routes that serve as a connection between a site boundary and entrance into the site*
3) *Public Rights-of-Way*
4) *Ramps and Curb Ramps*

Standard Ref.	Requirements	Compliance	Comments
3.3.1	**Surface:** firm, stable and slip resistant	Y N N/A	
3.3.1	**Lighting:** Provide in accordance with Section 5.7 (Lighting)	Y N N/A	
3.3.2	**Path of travel:** minimum 1.8 m wide	Y N N/A	
3.3.3.1	**Running Slope:** 1:20 (5%) (maximum)	Y N N/A	
3.3.3.2	**Cross Slope:** 1:20 (2%) (maximum) where surface is concrete or asphalt. 1:10 (10%) in all other cases.	Y N N/A	
3.3.1	**Rest Area:** If width is less than 1.8 m, provided every 30 m along path of travel. Rest area to be 1.8 m by 1.8 m (minimums)	Y N N/A	
3.3.4	**Guards:** Provide when change in level is more than 0.6 m	Y N N/A	
2.1.4	**Gratings or Openings:** 13 mm (maximum) wide in direction of travel. Longest side, if rectangular, must be perpendicular with the direction of travel	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

4. Curb Ramps

A curb ramp provides a transition where there is a change in level between exterior path of travel and adjacent vehicular route.

This section applies to:
1) *Pedestrian crossings at intersections*
2) *Parking spaces, passenger loading zones, and related access aisles*
3) *Any other exterior route where there is a grade change*

Standard Ref.	Requirements	Compliance	Comments
3.4.1	**Surface:** firm, stable and slip resistant	Y N N/A	
3.4.2	**Clear width:** 1.5 m (minimum), exclusive of flares	Y N N/A	
3.4.3	**Running Slope**: 1:12 (8.33%) (maximum)	Y N N/A	
3.4.3	**Cross Slope:** 1:50 (2%) (maximum) (see Figure 33b)	Y N N/A	
3.4.6	**Tactile Surface Walking Indicators (TWSI):** minimum depth of 610mm, at 150 mm to 200 mm from edge of curb (see 33b)	Y N N/A	
3.4.2.2	**Flared Side:** 1m wide; slope 1:15 to 1:10.	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

5. Ramps

Ramps are provided when the slope of a path of travel exceeds a gradient of 1:20 (5%)

Refer to the Ontario Building Code for all applied requirements for ramps.

For all ramp standards, see Figure 3

Standard Ref.	Requirements	Compliance	Comments
2.2.1.1	**Running Slope:** 1:15 (6.67%)	Y N N/A	
2.2.1.2	**Cross-Slope:** 1:50 (2%)	Y N N/A	
2.2.1	**Surface:** firm, stable and slip-resistant	Y N N/A	
2.2.1	**Clear Width:** 1.1 m (minimum)	Y N N/A	
2.2.1.4	**Colour Contrasting Strip:** to be provided at slope changes. 50 mm wide colour-contrasted and slip resistant strip equal to the width of the ramp	Y N N/A	
2.2.1	**Lighting:** provide in accordance with Section 5.7 (Lighting)	Y N N/A	
2.2.2	**Length:** 9 m, or less, or provide landing	Y N N/A	
2.2.2	**Landing:** to be provided at top, bottom or intermediate level, or where there is directional change. (see Figure 5)	Y N N/A	
2.2.3.1	**Handrail:** 865 to 965 mm high on both sides. **Clear width**: 1.1 m between handrails (see Figure 8)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

6. Stairs

This section applies to stairs provided for exterior or interior environments

Refer to the Ontario Building Code for all applied requirements for stairs

For all stair standards, see Figure 10

Standard Ref.	Requirements	Compliance	Comments
2.3	**Stairs:** where provided, an alternative accessible route is to be provided immediately adjacent, and may include a ramp or other accessible means of negotiating grade change	Y N N/A	Note which alternative to stairs is provided.
2.3.1	**Surface:** firm, stable and slip-resistant	Y N N/A	
2.3.1.1	**Tread:** 280 mm to 355 mm deep	Y N N/A	
2.3.1.1	**Riser:** 125 mm to 180 mm high	Y N N/A	
2.3.1	**Open Riser:** not permitted	Y N N/A	
2.3.1.2	**Nosing Projection:** 38 mm (maximum) (see Figure 10)	Y N N/A	
2.3.1.2	**Nosing Strip**: 50 mm deep, colour contrasted, at leading edge of tread and extending the full length of the tread	Y N N/A	
2.3.1.3	**Tactile Surface Walking Indicators (TWSI):** minimum of 610 mm deep, one tread back (see Figure 11)	Y N N/A	
2.3.1	**Lighting:** to be provided in accordance with Section 5.7	Y N N/A	
2.3.2.2	**Handrail:** 865 mm to 965 mm high on both sides. (see Figure 12)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

7. Building Entrance			This section does not apply ☐
Standard Ref	Requirements	Compliance	Comments
4.1.1	**Provision:** at least one (1) accessible entrance 50% of the total number of building entrances (see Figure 36)	Y N N/A	
4.1.1	**Provision:** 50% of the total number of building entrances must be accessible (see Figure 36)	Y N N/A	
4.1.1	**Provision:** 30 m or less from nearest accessible parking space, or passenger loading or drop off zones	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

8 Benches and Seats

This section applies to:
1) Rest areas and accessible routes
2) Outdoor public use seating areas
3) Waiting areas

Standard Ref	Requirements	Compliance	Comments
2.10.1	Seat height between 450 mm and 500 mm above finished floor (see Figure 23)	Y N N/A	
2.10.1	Seat depth between 330 mm and 510 mm	Y N N/A	
2.10.1	Back support extending 320 mm (minimum) above seat surface	Y N N/A	
2.10.1	Provide at least one (1) armrest at a height between 220 mm and 300 mm from the seat for additional support	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	
Description of Location	
Land Use Classification	
Development Size (units)	
Development Size (m^2)	
Number of Accesses and Locations	
Phase of Development	
Buildout Year	

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m^2
Industrial	5,000 m^2
Fast-food restaurant or coffee shop	100 m^2
Destination retail	1,000 m^2
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

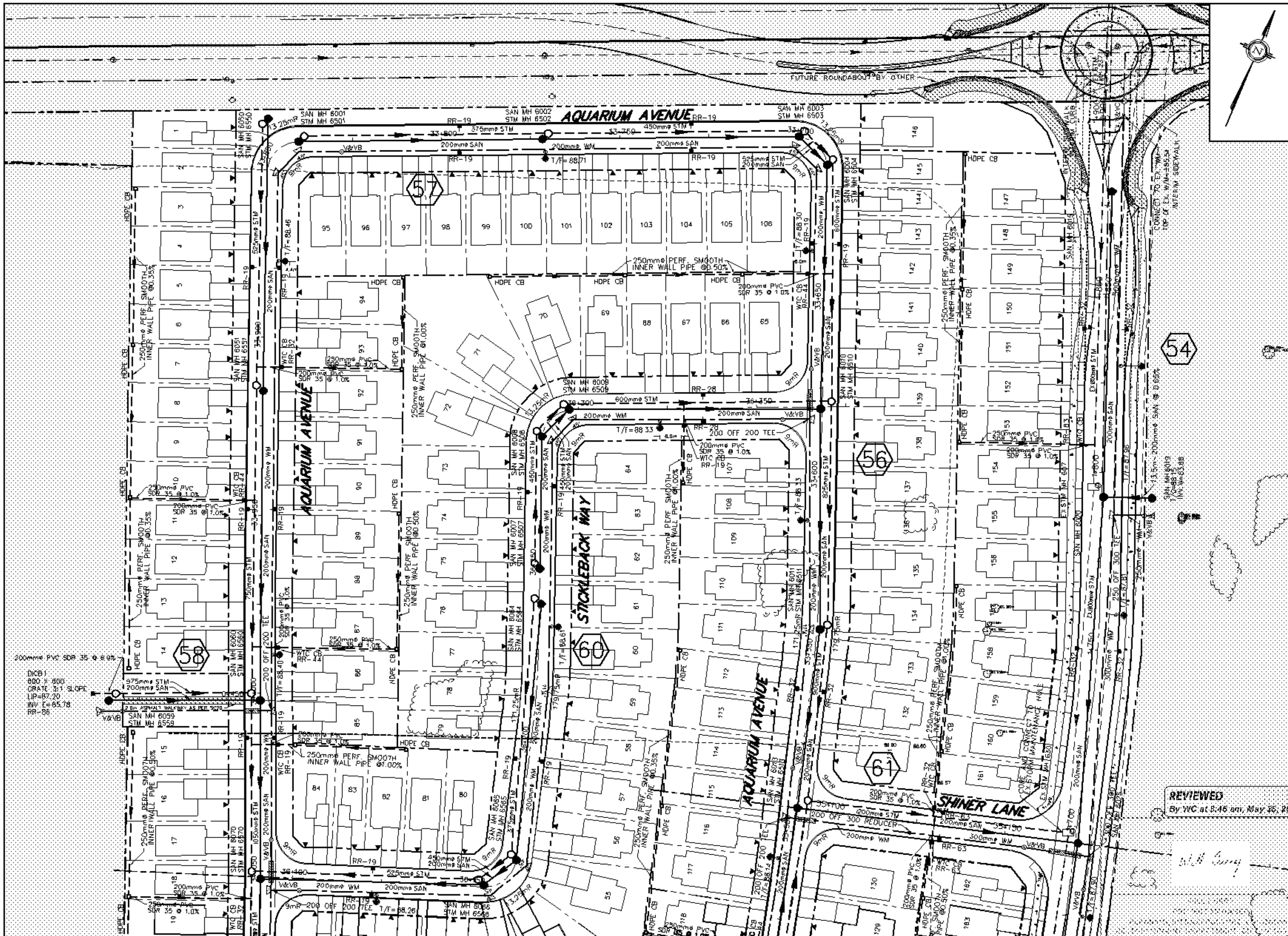
	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		
Is the proposed driveway within auxiliary lanes of an intersection?		
Does the proposed driveway make use of an existing median break that serves an existing site?		
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		
Does the development include a drive-thru facility?		

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?		
Does the development satisfy the Location Trigger?		
Does the development satisfy the Safety Trigger?		

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).



NOTES:

1. CONSTRUCT ALL WATERMAIN TO CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS (0500) AND SPECIFICATIONS. BEDDING SHALL BE AS PER OPSD 1102.01 AND OPSD 1102.02
2. PROVIDE INSULATION AT CATCHBASINS IN ACCORDANCE WITH CITY OF OTTAWA'S STANDARD DETAIL DRAWING W23.
3. INSTALL ALL SERVICES IN ACCORDANCE WITH CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS R21, W26, W36, W38 AND S11.1.
4. PROVIDE CATHODIC PROTECTION ON WATERMAIN AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.
5. RESTRAIN ALL BENDS, TEES, AND CAPS TO CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.
6. ALL PROPOSED WATER SERVICES AND MAINS MUST HAVE MINIMUM COVER OF 2.4m OTHERWISE PROVIDE THERMAL INSULATION AS PER O900 W22.
7. ALL SIDEWALKS SHALL BE HANDICAP ACCESSIBLE AND AS PER CITY PF OTTAWA'S STANDARD DETAIL DRAWINGS SC4, SC6 AND SC7.2.
8. ALL CONNECTION TO EXISTING WATERMAIN STUB SHALL BE PERFORM BY THE CITY OF OTTAWA. THE EXCAVATION, BACKFILL AND REINSTATEMENT SHALL BE PERFORM BY THE CONTRACTOR
9. CONNECT TO EXISTING SANITARY, STORM AND WATERMAIN STUBS.
10. IN AREAS WHERE SERVICE TRENCHES ARE LOCATED WITHIN 3 METRES OF RESIDENTIAL FOUNDATION, SUCH AS REAR YARD CATCHBASIN LEADS, IT WILL BE NECESSARY TO BACKFILL THE PORTION OF THE TRENCH BELOW THE FOUNDATION LEVEL WITH ENGINEERED FILL.
11. FOR THRUST BLOCK DESIGN ON THE WATERMAIN, A SOIL BEARING CAPACITY OF 50 KPA CAN BE USED (REFER TO 170401-701 FOR DESIGN).
12. ALL STORM SEWERS WITH 900mm IN DIAMETER AND GREATER MUST BE BENCHED. ALL SANITARY MANHOLES MUST BE BENCHED. SEWER SHALL HAVE CLASS "B" BEDDING
13. THE CITY OF OTTAWA WILL NOT PERMIT ANY ENCROACHMENTS ONTO ANY REAR YARD CATCH BASIN LEAD DRAINAGE EASEMENTS
14. ALL STORM AND SANITARY SERVICES ARE TO BE EQUIPPED WITH A BACKWATER VALVE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S14 AND S14.2
15. ALL HYDRANTS ARE TO BE LOCATED AND INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS W18 AND W19.
16. CONTRACTOR IS TO REPAIR BENCHING TO ALL EXISTING SAN MH PRIOR TO CONNECTIONS.
17. SPECIAL PIPE BEDDING AND COVER IS REQUIRED IN AREAS OF GRAY SILTY CLAY AND SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO BACKFILL
18. CURBS SHALL BE DEPRESSED AT EVERY ENTRANCE CROSSING AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC1.1 AND SC7.1.
19. PERFORATED PIPE FOR REAR YARD SHALL BE INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S29
20. ALL MANHOLE COVERS ARE TO HAVE RUBBER PLUGS AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S24 AND S24.1.
21. STORM AND SANITARY SERVICE CONNECTIONS MUST BE ABOVE THE SPRING LINE OF THE SEWER MAIN PIPE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S11
22. SERVICE CONNECTIONS TO SEWERS OVER 5m DEEP REQUIRE APPROVED CONTROLLED SETTLEMENT JOINTS AS PER CITY OF OTTAWA STANDARD DETAIL DRAWINGS S11 AND S11.1.

LEGEND

- EXISTING DECIDUOUS TREE
- EXISTING TREE LINE
- EXISTING FIRE HYDRANT
- EXISTING VALVE AND VALVE CHAMBER
- EXISTING VALVE AND VALVE BOX
- EXISTING STORM MANHOLE
- EXISTING SANITARY MANHOLE
- EXISTING CATCHBASIN
- EXISTING LIGHT POLE
- EXISTING HYDRO POST
- EXISTING SIGN
- EX. PADMOUNT HYDRO TRANSFORMER
- EXISTING BELL PEDESTAL
- EXISTING CABLE PEDESTAL
- EXISTING STANDARD IRON BAR
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED WATERMAIN
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED BEND C/W THRUSTBLOCK (SPECIAL DESIGN)
- PROPOSED CAP C/W THRUSTBLOCK (SPECIAL DESIGN)
- PROPOSED VALVE AND VALVE BOX
- PROPOSED VALVE AND VALVE CHAMBER
- PROPOSED FIRE HYDRANT
- PROPOSED DITCH INLET CATCHBASIN AS PER OPSD 705.030
- PROPOSED HDPE CB AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S30 AND S31.
- PROPOSED WATERTIGHT COVER
- PROPOSED CATCHBASIN
- PROPOSED INSULATION
- PROPOSED TOP OF FLANGE ELEVATION
- HOUSE SERVICE
- CURB RADIUS
- TACTILE WALKING SURFACE INDICATORS AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC7.1 AND SC7.3
- OUTSIDE PROPOSED DEVELOPMENT
- SITE PLAN APPROVAL
- TOP OF FLANGE – HYDRANT ±450mm ABOVE GROUND LEVEL ON SOUTH SIDE OF [illegible]

AVALON ENCORE STAGE 6 PERMANENT ICD

RR-19 = 83mm DIAMETER ICD, RELEASE RATE OF 19.0 L/S
RR-24 = 94mm DIAMETER ICD, RELEASE RATE OF 24.0 L/S
RR-28 = 102mm DIAMETER ICD, RELEASE RATE OF 26.5 L/S
RR-32 = 108mm DIAMETER ICD, RELEASE RATE OF 32.0 L/S
RR-44 = 127mm DIAMETER ICD, RELEASE RATE OF 44.0 L/S
RR-45 = 127mm DIAMETER ICD, RELEASE RATE OF 45.0 L/S
RR-62 = 152mm DIAMETER ICD, RELEASE RATE OF 62.0 L/S
RR-63 = 152mm DIAMETER ICD, RELEASE RATE OF 63.0 L/S
RR-65 = 152mm DIAMETER ICD, RELEASE RATE OF 65.0 L/S

AVALON ENCORE STAGE 6 TEMPORARY ICD

DICB 1 – RR-86 = 178mm DIAMETER ICD, RELEASE RATE OF 86.0 L/S
DICB 2 – RR-78.5 = 178mm DIAMETER ICD, RELEASE RATE OF 78.5 L/S
DICB 3 – RR-45 = 127mm DIAMETER ICD, RELEASE RATE OF 45.0 L/S
STMH 6620 – RR-53 = 127mm DIAMETER ICD, RELEASE RATE OF 53.0 L/S (PLUG TYPE)

OUTSIDE OF PROPOSED DEVELOPMENT ICD

RR-41 = 127mm DIAMETER ICD, RELEASE RATE OF 41.0 L/S
RR-80 = 152mm DIAMETER ICD, RELEASE RATE OF 80.0 L/S
RR-74 = 188mm DIAMETER ICD, RELEASE RATE OF 74.0 L/S
RR-288 = 334mm DIAMETER ICD, RELEASE RATE OF 288.0 L/S

* REFER TO 170401-701 FOR DETAILS
* ICD SHALL BE WALL MOUNT TYPE EXCEPT IF IDENTIFIED OTHERWISE

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

minto

No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
1	AS PER CITY COMMENTS	MAR 16/18	AGS
2	ISSUED FOR TENDER	MAR. 28/18	AGS
3	AS PER CITY COMMENTS	APR 26/18	AGS
4	ISSUED FOR CONSTRUCTION	MAY 7/18	AGS
5	AS PER CITY COMMENTS	MAY 17/18	AGS

SCALE 1:500 (5m 0 15m)

DESIGN	PLM
CHECKED	AGS
DRAWN	PNC
CHECKED	PLM
APPROVED	AGS

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — s.21 — May 17, 2018

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

CLIENT No 148
PROJECT No. 170401

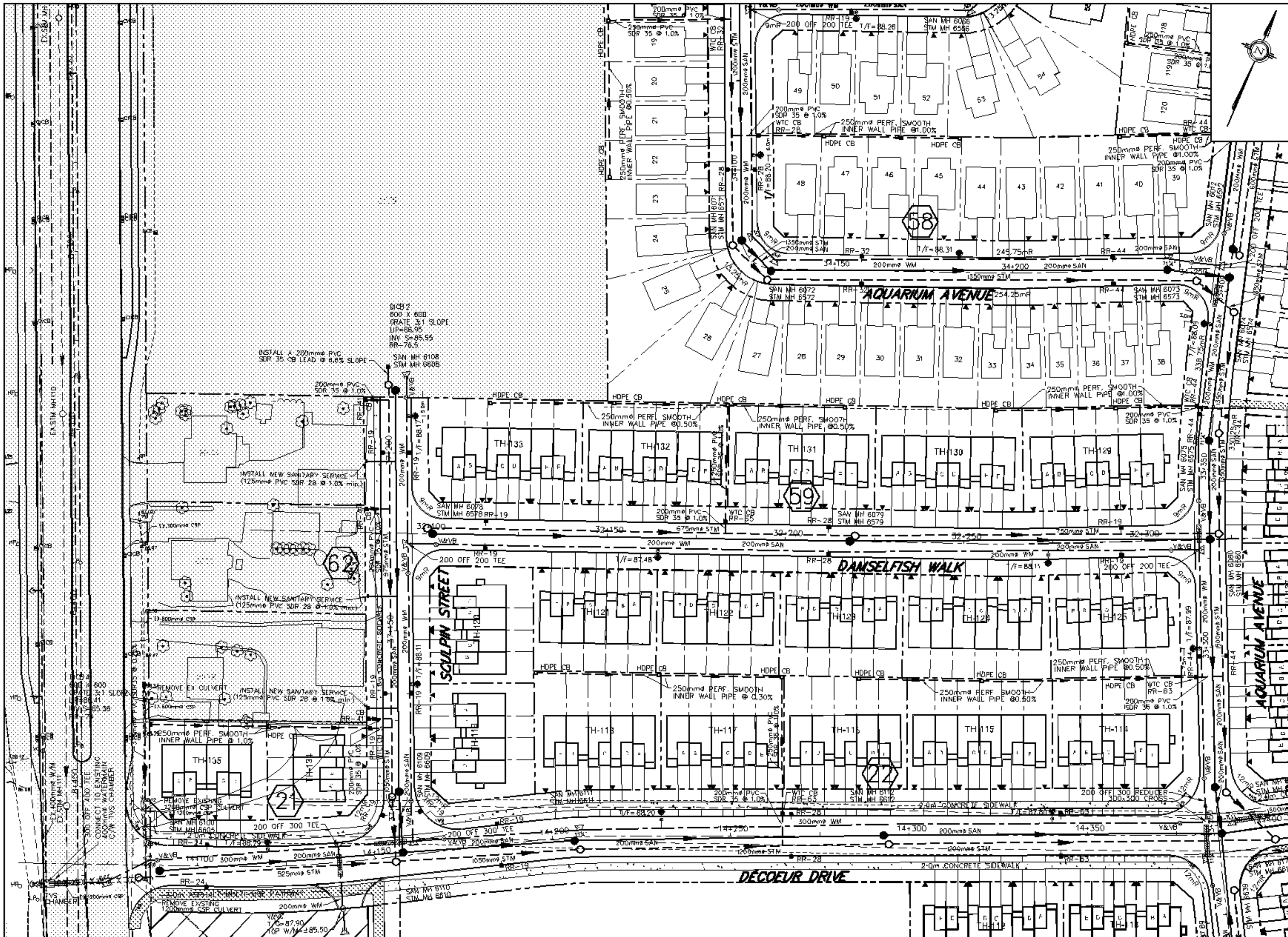
PLAN
GENERAL PLAN OF SERVICES

DRAWING No 170401-S5

D07-16-09-0018-STAGE 6

16796

000056



NOTES:

1. CONSTRUCT ALL WATERMAIN TO CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS (0500) AND SPECIFICATIONS. BEDDING SHALL BE AS PER OPSD 1102.01 AND OPSD 1102.02
2. PROVIDE INSULATION AT CATCHBASINS IN ACCORDANCE WITH CITY OF OTTAWA'S STANDARD DETAIL DRAWING W23.
3. INSTALL ALL SERVICES IN ACCORDANCE WITH CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS R21, W26, W36, W38 AND S11.1.
4. PROVIDE CATHODIC PROTECTION ON WATERMAIN AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.
5. RESTRAIN ALL BENDS, TEES, AND CAPS TO CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.
6. ALL PROPOSED WATER SERVICES AND MAINS MUST HAVE MINIMUM COVER OF 2.4m OTHERWISE PROVIDE THERMAL INSULATION AS PER OSDD W22.
7. ALL SIDEWALKS SHALL BE HANDICAP ACCESSIBLE AND AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC4, SC6 AND SC7.2.
8. ALL CONNECTION TO EXISTING WATERMAIN STUB SHALL BE PERFORM BY THE CITY OF OTTAWA. THE EXCAVATION, BACKFILL AND REINSTATEMENT SHALL BE PERFORM BY THE CONTRACTOR.
9. CONNECT TO EXISTING SANITARY, STORM AND WATERMAIN STUBS.
10. IN AREAS WHERE SERVICE TRENCHES ARE LOCATED WITHIN 3 METRES OF RESIDENTIAL FOUNDATION, SUCH AS REAR YARD CATCHBASIN LEADS, IT WILL BE NECESSARY TO BACKFILL THE PORTION OF THE TRENCH BELOW THE FOUNDATION LEVEL WITH ENGINEERED FILL.
11. FOR THRUST BLOCK DESIGN ON THE WATERMAIN, A SOIL BEARING CAPACITY OF 90 KPA CAN BE USED (REFER TO 170401-701 FOR DESIGN).
12. ALL STORM SEWERS WITH 900mm IN DIAMETER AND GREATER MUST BE BENCHED. ALL SANITARY MANHOLES MUST BE BENCHED. SEWER SHALL HAVE CLASS "B" BEDDING
13. THE CITY OF OTTAWA WILL NOT PERMIT ANY ENCROACHMENTS ONTO ANY REAR YARD CATCH BASIN LEAD DRAINAGE EASEMENTS.
14. ALL STORM AND SANITARY SERVICES ARE TO BE EQUIPPED WITH A BACKWATER VALVE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S14 AND S14.2
15. ALL HYDRANTS ARE TO BE LOCATED AND INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS W18 AND W19.
16. CONTRACTOR IS TO REPAIR BENCHING TO ALL EXISTING SAN MH PRIOR TO CONNECTIONS.
17. SPECIAL PIPE BEDDING AND COVER IS REQUIRED IN AREAS OF GRAY SILTY CLAY AND SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO BACKFILL
18. CURBS SHALL BE DEPRESSED AT EVERY ENTRANCE CROSSING AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC1.1 AND SC7.1.
19. PERFORATED PIPE FOR REAR YARD SHALL BE INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S29
20. ALL MANHOLE COVERS ARE TO HAVE RUBBER PLUGS AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S24 AND S24.1.
21. STORM AND SANITARY SERVICE CONNECTIONS MUST BE ABOVE THE SPRING LINE OF THE SEWER MAIN PIPE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S11
22. SERVICE CONNECTIONS TO SEWERS OVER 5m DEEP REQUIRE APPROVED CONTROLLED SETTLEMENT JOINTS AS PER CITY OF OTTAWA STANDARD DETAIL DRAWINGS S11 AND S11.1.

LEGEND

- DEC 300mm — EXISTING DECIDUOUS TREE
- EXISTING TREE LINE
- EXISTING CATCHBASIN
- LP — EXISTING LIGHT POLE
- EX PADMOUNT HYDRO TRANSFORMER
- BPed — EXISTING BELL PEDESTAL
- TVPed — EXISTING CABLE PEDESTAL
- SIB — EXISTING STANDARD IRON BAR
- EXISTING WATERMAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- PROPOSED WATERMAIN
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED STORM MANHOLE
- PROPOSED SANITARY MANHOLE
- PROPOSED BEND C/W THRUSTBLOCK (SPECIAL DESIGN)
- PROPOSED CAP C/W THRUSTBLOCK (SPECIAL DESIGN)
- V&VB — PROPOSED VALVE AND VALVE BOX
- V&VC — PROPOSED VALVE AND VALVE CHAMBER
- PROPOSED FIRE HYDRANT
- DICB — PROPOSED DITCH INLET CATCHBASIN AS PER OPSD 705.030
- HDPE CB — PROPOSED HDPE CB AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S30 AND S31.
- WTC — PROPOSED WATERTIGHT COVER
- CB — PROPOSED CATCHBASIN
- PROPOSED INSULATION
- T/F=87.38 — PROPOSED TOP OF FLANGE ELEVATION
- HOUSE SERVICE
- 9mR — CURB RADIUS
- TWSI — TACTILE WALKING SURFACE INDICATORS AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC 7 AND SC 7.3
- OUTSIDE PROPOSED DEVELOPMENT
- SITE PLAN APPROVAL

REVIEWED
By WC at 8:44 am, May 28, 2018

AVALON ENCORE STAGE 6 PERMANENT ICD

RR-19 = 83mm DIAMETER ICD, RELEASE RATE OF 19.0 L/S
RR-24 = 94mm DIAMETER ICD, RELEASE RATE OF 24.0 L/S
RR-28 = 102mm DIAMETER ICD, RELEASE RATE OF 28.5 L/S
RR-32 = 108mm DIAMETER ICD, RELEASE RATE OF 37.0 L/S
RR-44 = 127mm DIAMETER ICD, RELEASE RATE OF 44.0 L/S
RR-45 = 127mm DIAMETER ICD, RELEASE RATE OF 45.0 L/S
RR-62 = 152mm DIAMETER ICD, RELEASE RATE OF 62.0 L/S
RR-63 = 152mm DIAMETER ICD, RELEASE RATE OF 63.0 L/S
RR-65 = 152mm DIAMETER ICD, RELEASE RATE OF 65.0 L/S

AVALON ENCORE STAGE 6 TEMPORARY ICD

DICB 1 - RR-86 = 178mm DIAMETER ICD, RELEASE RATE OF 86.0 L/S
DICB 2 - RR-78.5 = 178mm DIAMETER ICD, RELEASE RATE OF 78.5 L/S
DICB 3 - RR-45 = 127mm DIAMETER ICD, RELEASE RATE OF 45.0 L/S
CBMH 6626 - RR-53 = 127mm DIAMETER ICD, RELEASE RATE OF 53.0 L/S (PLUG TYPE)

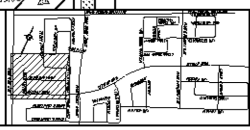
OUTSIDE OF PROPOSED DEVELOPMENT ICD

RR-41 = 127mm DIAMETER ICD, RELEASE RATE OF 41.0 L/S
RR-60 = 152mm DIAMETER ICD, RELEASE RATE OF 60.0 L/S
RR-74 = 168mm DIAMETER ICD, RELEASE RATE OF 74.0 L/S
RR-288 = 334mm DIAMETER ICD, RELEASE RATE OF 288.0 L/S

* REFER TO 170401-101 FOR DETAILS
* ICD SHALL BE WALL MOUNT TYPE EXCEPT IF IDENTIFIED OTHERWISE

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

minto



No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
△	AS PER CITY COMMENTS	MAR 16/18	AGS
△	ISSUED FOR TENDER	MAR. 28/18	AGS
△	AS PER CITY COMMENTS	APR 26/18	AGS
△	ISSUED FOR CONSTRUCTION	MAY 7/18	AGS
△	AS PER CITY COMMENTS	MAY 17/18	AGS

SCALE 1:500

DESIGN	PLM
CHECKED	AGS
DRAWN	PNC
CHECKED	PLM
APPROVED	AGS

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — s.21

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

CLIENT No. 148
PROJECT No. 170401

PLAN
GENERAL PLAN OF SERVICES

DRAWING No. 170401-S4

D07-16-05-0018-STAGE 6

16796

000057

DRAFT

- All Units to Metric Unless Otherwise Noted.
- Base Information Obtained From Various Sources And Is Approximate.
- Schedule / Plan Information Is Conceptual And Requires Verification by Appropriate Agency
- Aerial Photo: Google Earth, Approx. Spring 2019

GERRARD DESIGN

CAIVAN 2075 MER BLEUE | Ottawa, Ontario

PRELIMINARY LOTTED CONCEPT

SEP 18, 2020
PROJECT 2083
SCALE 1:1500

SK-02

Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines

Background: Existing Clay Soils Policy

The City of Ottawa's Clay Soils Policy, as it is often referred to by city staff and external stakeholders, is derived from a 2005 report titled Trees and Foundations Strategy in Areas of Sensitive Marine Clay in the City of Ottawa (approved by Planning and Environment Committee on September 27, 2005 and by City Council on October 12, 2005).

This report was mainly focused on the provision of a risk management framework for the assessment and mitigation or possible removal of existing City trees where the trees were identified as a significant contributing factor for foundation damage. One of the six recommendations speaks to the planting of new trees on City property in Sensitive Marine Clay (SMC) soils, which can be used interchangeably with the more technical terminology of Champlain Sea Clay soils – but for the purposes of this report, the term Sensitive Marine Clay soils will be used because of historical continuity with the 2005 report noted above.

This recommendation established that when planting trees on city property where SMC soils are known to exist, the tree must be low water demand and planted at a distance equivalent to the full mature height of the tree from a building foundation or structure. This became the Council direction and policy for all new street tree planting in SMC soils, or simply, the Clay Soils Policy.

The practical result of the implementation of this policy has been many new subdivisions with only four varieties of small ornamental trees (Amur Maple, Serviceberry, Crab Apple and Japanese Lilac, which can be planted at a separation distance of 7.5 meters, their approximate mature height, from a building foundation) and some streets with no trees at all.

The Policy has since been described by some stakeholders as overly onerous, highly risk adverse, and based on inadequate scientific evidence. The results have been undesirable for residents, the Development Industry, and the City of Ottawa, who all wish to see tree-lined streets that contribute to the health and liveability of new communities and to work towards Council's strategic initiative of increasing urban forest cover.

Towards an Improved Clay Soils Policy

In March 2015, Planning Committee approved the report titled Building Better and Smarter Suburbs: Strategic Directions and Action Plan. Two of the Action Plan items in the report specifically dealt with obtaining better geotechnical information on clay soils and using that improved scientific basis to bring flexibility to the existing Clay Soils Policy where warranted. This builds on the early work of the draft Street Tree Manual for Greenfield Neighbourhoods, which demonstrated that improvements to tree planting in greenfield communities could only be accomplished by revising the Clay Soils Policy.

During the spring and summer of 2016, under the direction of the Greater Ottawa Homebuilders Association, a group of companies with expertise in geotechnical engineering, landscape architecture and forestry, including Golder, Paterson, Houle Chevrier, NAK and IFS Associates, undertook a review the City of Ottawa's existing requirements for tree planting in sensitive marine clay soils. Background information used for this review included the City of Ottawa's Draft Street Tree Manual (June 2015) and the United Kingdom's National House Building Council – Chapter 4.2 Building Near Trees (NHBC Standards 2016).

This 2016 review resulted in proposed technical revisions to the Clay Soils Policy. City staff from Forestry, Planning, Parks and Facilities Planning, and Legal have reviewed and built upon these proposed revisions to produce the Tree Planting in Sensitive Marine Clay Soils – 2017 Guidelines. These collaborative efforts are

based on the notion of planting trees in SMC soils in accordance with improved scientific and geotechnical information, with updated technical and procedural details outlined in this document.

The Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines were received by Planning Committee on September 26, 2017, and approved by delegated authority in October 2017. Going forward, implementation of the 2017 Guidelines is expected to increase the number and/or size and variety of street trees in new subdivisions in areas of sensitive marine clay soils.

Guidelines for Tree Planting in Sensitive Marine Clay Soils

The following Guidelines are primarily focused on small and medium size street trees. However, large trees (mature height over 14m) can still be planted in areas of SMC soils provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g. in a park or other green space).

For street trees in the road right-of-way where SMC soils have been identified, the tree to foundation setbacks may be reduced to **4.5m** for small (mature tree height up to 7.5m) and medium size trees (mature tree height 7.5m-14m) provided all of the following six conditions are met:

1. The modified plasticity index of the soil between the underside of footing (USF) and a depth of 3.5m generally does not exceed 40%. This corresponds to soils with low/medium potential for soil volume change. Clay soils that exceed the 40% plasticity index are considered to have high potential for soil volume change. For these worst-case soils, the setbacks and tree planting restrictions remain unchanged from the 2005 Clay Soils Policy (tree setback must equal the mature height of the tree – i.e. 7.5m setback for small trees).

2. The USF is 2.1m or greater below the lowest finished grade. Note: this footing level must be satisfied for footings within 10m of the tree, as measured from the centre of the tree trunk, and verified by means of the Grading Plan as indicated in the Procedural Changes below.

3. A **small** size tree must be provided with a minimum of **25m^3** of available soil volume, as determined by a Landscape Architect. A **medium** size tree must be provided with a minimum of **30m^3** of available soil volume, as determined by a Landscape Architect. The developer will ensure the soil is generally uncompacted when backfilling in street tree planting locations.

   Note: the soil volume calculation must be based on a depth of 1.5m below finished grade (e.g. 5m length x 4m width at surface x 1.5m depth = 30m^3). It may include lands in the right-of-way and on private property, but must subtract the volume of shallow utility trenches (i.e. volume of shallow utility trenches cannot count towards minimum soil volume).

4. The tree species must be small to medium size, as confirmed by a Landscape Architect in the Landscape Plan.

5. The foundation walls are to be reinforced at least nominally (minimum of two upper and two lower 15M bars in the foundation wall) to provide ductility as described in the Geotechnical Report.

6. Grading surrounding the tree must promote draining to the tree root zone (in such a manner as not to be detrimental to the tree), as noted on the subdivision Grading Plan.

Procedural Changes Required to Implement the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines:

In areas of clay soils, the following procedures and conditions are to be followed for new plans of subdivision:

Tests

- One Atterberg Limits test and one water content test on 150 metre spacing (closer spacing where there are variations in soil composition, topography, etc.) and a grain size test for every four boreholes.
- One shrinkage test per subdivision.

Grading Plan

- The USF depth will be verified by means of the grading plan.
- The subdivision grading plan will promote draining to the tree root zone (in such a manner as not to be detrimental to the tree) and be noted in a drawing as part of the Grading Plan.

Geotechnical Reports

- Reinforcement of foundation walls will be confirmed by the Geotechnical Report. In any SMC soils, foundation walls are to be reinforced at least nominally, with a minimum of two upper and two lower 15M (rebar size) bars in the foundation wall.
- A Geotechnical Engineer will provide a separate section within the Geotechnical Report on Sensitive Marine Clay soils, which includes a signed letter and corresponding map that confirms the locations of low/medium and/or high sensitivity clay soils, as determined by the plasticity tests (referenced above under Guideline 1).
- The Geotechnical Report with signed letter and map will be provided to the Landscape Architect prior to preparation of the Landscape Plan in order to inform details of the Landscape Plan.
- The Geotechnical Report with signed letter and map will be circulated by the City Planner file lead, with the Landscape Plan, to Forestry staff and the Planning Foresters for review in conjunction with the Landscape Plan. This must be completed prior to registration of the subdivision agreement.

Landscape Plan

- A Landscape Architect will develop a Landscape Plan that is consistent with the information and recommendations provided in the Geotechnical Report to the satisfaction of the Planning, Infrastructure and Economic Development Department and Forestry Services. The Landscape Plan shall include a note indicating that is has been developed as per the Geotechnical Report (date, author), the letter (date, author), and Map (date, title).
- At the time of tree planting, in addition to providing an F1 inspection form, the Landscape Architect will provide a signed letter indicating that trees are of small or medium size and have been planted with appropriate soil volume, as noted in Guidelines #3 and #4 above.

Minimum Number of Trees per Plan of Subdivision

- In areas of low/medium plasticity SMC soils (modified plasticity index generally does not exceed 40%), the minimum number of trees that must be provided in a plan of subdivision will be one tree per lot, and two per corner lot, with the following exceptions that intend to maximize the number of medium size trees that can be planted:
    - Where abutting properties form a continuous greenspace between driveways (i.e. many townhouse and semi-detached dwellings; some detached dwellings where driveways are on opposite sides of the house) one medium size tree will be planted instead of two smaller sized trees, provided the minimum recommended soil volume can be achieved. In these cases only, for the purpose of determining the minimum number of trees in a plan of subdivision, one medium size tree that is replacing two small trees will be "counted" as two trees.
    - The medium size tree should be planted as close as possible to the middle of this continuous greenspace (in the right-of-way) to maximize available soil volume.
    - On larger lots with sufficient soil volume for a medium size tree, one medium size tree will be planted on each lot (or each side of a corner lot), even if abutting properties form a continuous greenspace between driveways.

Subdivision Conditions

The following details are intended to assist file leads with the writing of new draft plan of subdivision conditions to support the implementation of the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines:

- City of Ottawa Forestry staff will:
    - Review the Geotechnical Report and prepare and approve any direction to homeowners regarding tree watering or surface permeability in proximity to trees.
    - Notify homeowners that trees on City property will be subject to City tree maintenance programs for pruning and other maintenance.
    - Provide file leads with the appropriate Subdivision Conditions prior to registration.
- In areas of low/medium plasticity SMC soils (modified plasticity index generally does not exceed 40%):
    - The minimum number of trees that must be provided in a plan of subdivision will be one tree per lot, and two per corner lot, except where abutting properties form a continuous greenspace between driveways. In these cases, one medium size tree will be planted instead of two small size trees, provided the minimum $30m^3$ of soil volume can be achieved. In these cases only, for the purpose of determining the minimum number of trees in a plan of subdivision, one medium size tree that is replacing two small trees will be "counted" as two trees.
    - The medium size tree should be planted as close as possible to the middle of this continuous greenspace (in the right-of-way) to maximize available soil volume.
    - On larger lots with sufficient soil volume for a medium size tree, one medium size tree will be planted on each lot (or each side of a corner lot), even if abutting properties form a continuous greenspace between driveways.
    - Where medium size trees cannot be planted because of high plasticity clay soils, small trees shall be planted at one tree per lot.
    - If trees need to be replaced, Forestry staff reserve the right to plant appropriate size trees at one tree per lot.

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 6142-BEJHCE
Issue Date: August 1, 2019

Minto Communities Inc.
180 Kent Street, Unit 200
Ottawa, Ontario
K1P 0B6

Site Location: Avalon West (Neighbourhood 5) Stormwater Management Pond Expansion
Part of Lot 4, Concession 11 (Cumberland)
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

modifications to existing stormwater management Works to serve Summerside South - Phase 1 development, located in the City of Ottawa, for the collection, transmission, treatment and disposal of stormwater runoff from a total catchment area of 255.90 hectares, to provide Enhanced Level water quality protection and erosion control, and to attenuate post-development peak flows to pre-development peak flows for all storm events up to and including the 100-year storm event, discharging to McKinnon's Creek, consisting of the following:

- **stormwater management facility (catchment area 255.90 hectares):** wet pond expansion with one (1) new sediment forebay, located south of Brian Coburn Boulevard, between Tenth Line Road and Mer Bleue Road, having a permanent storage volume of 106,087 cubic metres, an extended detention volume of 20,511 cubic metres, and a total storage volume of 217,211 cubic metres including the permanent pool, at a total depth of 3.60 metres, an additional outlet structure comprised of a 3.5 metre long concrete weir equipped with a 1,200 millimetre diameter storm outlet pipe, allowing a maximum discharge of 12,900 litres per second and 17,476 litres per second under the 100-year storm event to Points C and E, respectively, in McKinnon's Creek, located immediately behind Blocks 118 to 128, and Blocks 482 and 485;

Previous Works:

- **grassed swale:** a 300 metre long grassed conveyance ditch constructed on municipal land from the outlet of the existing Western Trunk Storm Sewer, designed to accommodate the run-off up to the 100-year storm

event from a catchment area of 6.59 hectares, having a maximum ponding depth of 1.61 metres, a bottom width of 1 metre, a top width of 24 metres, and 3:1 side slopes, complete with an inlet rip-rap lined 20 metres long and 10 metres wide plunge pool, discharging to the sediment forebay of the stormwater management facility;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

Definitions:

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

3. "District Manager" means the District Manager of the appropriate local District Office of the Ministry, where the Works are geographically located;

4. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended;

5. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

6. "Owner" means Minto Communities Inc., and includes its successors and assignees;

7. "OWRA" means the *Ontario Water Resources Act, R.S.O. 1990, c. O.40* , as amended;

8. "Previous Works" means those portions of the sewage Works previously approved under an Approval;

9. "Works" means the sewage Works described in the Owner's application, and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

4. Where there is a conflict between the documents listed in Schedule "A" and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

5. The conditions of this Approval are severable. If any condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

2. In the event that completion and commissioning of any portion of the Works is anticipated to be delayed beyond the specified expiry period, the Owner shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of Approval of the Works are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of Owner;

b. change of address of the Owner;

c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act,* R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or

d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act,* R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

3. The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

2. The Owner shall make all necessary investigations, take all necessary steps and obtain all necessary approvals so as to ensure that the physical structure, siting and operations of the Works do not constitute a safety or health hazard to the general public.

3. The Owner shall inspect and ensure that the design minimum liquid retention volume is maintained in the Works at all times, except when maintenance is required.

4. The Owner shall undertake an inspection of the condition of the Works, at least once a year, and undertake any necessary cleaning and maintenance to ensure that sediment, debris and excessive decaying vegetation are removed from the Works to prevent the excessive build-up of sediment, oil/grit, debris and/or decaying vegetation, to avoid reduction of the capacity and/or permeability of the Works, as applicable. The Owner shall also regularly inspect and clean out the inlet to and outlet from the Works to ensure that these are not obstructed.

5. The Owner shall construct, operate and maintain the Works with the objective that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen,

foam or discoloration on the receiving waters.

6. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Owner's administrative office for inspection by the Ministry. The logbook shall include the following:

   a. the name of the Works; and

   b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed and method of clean-out of the Works.

7. The Owner shall prepare an operations manual prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information:

   a. operating and maintenance procedures for routine operation of the Works;

   b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

   c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;

   d. contingency plans and procedures for dealing with potential spills and any other abnormal situations and for notifying the District Manager; and

   e. procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

8. The Owner shall maintain the operations manual current and retain a copy at the Owner's administrative office for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

5. TEMPORARY EROSION AND SEDIMENT CONTROL

1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to

maintain the temporary sediment and erosion control measures.

6. REPORTING

1. One (1) week prior to the start-up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start-up date.

2. The Owner shall, upon request, make all reports, manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

3. The Owner shall prepare a performance report within ninety (90) days following the end of the period being reported upon, and submit the report(s) to the District Manager when requested. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be prepared to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

   a. a description of any operating problems encountered and corrective actions taken;

   b. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works;

   c. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

   d. a summary of all spill or abnormal discharge events; and

   e. any other information the District Manager requires from time to time.

7. RECORD KEEPING

1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation, maintenance and monitoring activities required by this Approval.

Schedule "A"

1. Application for Environmental Compliance Approval, dated June 28, 2019, received on July 4, 2019, submitted by Minto Communities Inc.;

2. Transfer of Review Letter of Recommendation, dated June 28, 2019. revised on July 24, 2019, and signed by Jeff McEwen, P. Eng., Manager, Development Review East Branch, City of Ottawa, including the following supporting documents:

   a. Final Plans and Specifications prepared by David Schaeffer Engineering Ltd.

   b. Stormwater Management Report prepared by David Schaeffer Engineering Ltd.

3. Email received on July 19, 2019 from Jeff McEwen, P. Eng., City of Ottawa.

4. Email received on July 23, 2019 from Kate Anderson, E.I.T., David Schaeffer Engineering Ltd.

5. Emails received on July 22, 2019, July 24, 2019, and July 30, 2019 from Will Curry, C.E.T., City of Ottawa.

6. Emails received on July 30, 2019 from Jennifer Ailey, P. Eng., David Schaeffer Engineering Ltd.

7. Application for Approval of Municipal and Private Sewage Works, dated August 13, 2007, with cover letter and Attachments 2, 3, and 4 from Charles Warnock, Program Manager, Infrastructure Approvals, City of Ottawa, dated October 4, 2007 and received on October 9, 2007;

8. Taggart Realty Management: Neighbourhood 5 - East Urban Community Interim Stormwater Management Report, prepared by IBI Group, dated July 2007 and received on August 14, 2007;

9. Set of engineering drawings for Neighbourhood 5 Interim SWM Facility, (Contract No. 12130), prepared by IBI Group, dated July 2007;

10. Revised Drawing No. 100A, Neighbourhood 5 Interim SWM Facility, (Project No. 12130), prepared by IBI Group, dated April 7, 2008;

11. Letter from Robert W. Wingate of IBI Group to the Ministry, dated November 9, 2007;

12. Letter from Peter Deir of IBI Group to the Ministry, dated November 13, 2007;

13. Letter from Ted Phillips of Taggart Investments to the Ministry, dated December 18,

2007;

14. Written procedure issued March 6, 2008 and cosigned by Robert W. Wingate of IBI Group and Ted Edward Phillips of Taggart Realty;

15. Application for Approval of Municipal and Private Sewage Works, dated November 6, 2009 and received on November 19, 2009, Neighbourhood 5 Phase II Interim Stormwater Management Report, dated August 2009, and drawings and addendum documents prepared and submitted by IBI Group;

16. Application for Approval of Municipal and Private Sewage Works, dated March 1, 2011 and received on March 5, 2011, and final plans and specifications prepared by IBI Group;

17. Application for Amended Environmental Compliance Approval, dated March 19, 2013 and received on March 21, 2013, submitted by the City of Ottawa;

18. Avalon West (Neighbourhood 5) Interim Stormwater Management Report, dated March 2013, prepared by IBI Group;

19. Engineering Drawings 104, dated February 27, 2012, and 700A, dated February 21, 2012, prepared by IBI Group;

20. E-mail from Rikke Brown of IBI Group to the Ministry, dated May 22, 2013;

21. E-mail from Rikke Brown of IBI Group to the Ministry, dated May 23, 2013;

22. Application for Environmental Compliance Approval, dated November 1, 2013 and received on January 7, 2014, submitted by the City of Ottawa;

23. Avalon West (Neighbourhood 5) Stormwater Management Facility Design, Revision 5, dated October 2013, prepared by IBI Group;

24. Set of Engineering Drawings (14 drawings) for Avalon West (Neighbourhood 5) SWM Facility, dated September 19, 2013, prepared by IBI Group;

25. Copy of letter from James Holland of South Nation Conservation to Minto Communities Inc., dated November 25, 2013;

26. E-mail from Peter Deir of IBI Group to the Ministry, dated July 9, 2014;

27. Application for Environmental Compliance Approval, dated June 8, 2015 and received on June 24, 2015, submitted by the City of Ottawa;

28. Stormwater Management Report for Summerside West Phase 1, dated June 2015,

prepared by J.F. Sabourin and Associates Inc.;

29. Copy of memorandum from IBI Group to David Schaeffer Engineering Ltd., dated November 3, 2014;

30. Copy of e-mail from Mathieu Leblanc of South Nation Conservation to David Schaeffer Engineering Ltd., dated June 23, 2015;

31. E-mail from Jennifer Ailey of David Schaeffer Engineering Ltd. to the Ministry, dated September 2, 2015;

32. E-mail from Peter Deir of IBI Group to the Ministry, dated September 17, 2015; and

33. E-mail from Jennifer Ailey of David Schaeffer Engineering Ltd. to the Ministry, dated September 30, 2015.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from the Works are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the Works. The Condition also ensures that adequate storage is maintained in the Works at all times as required by the design. Furthermore, this Condition is included to ensure that the Works are operated and maintained to function as designed.

5. Condition 5 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.

6. Condition 6 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

7. Condition 7 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 1339-A28J6Z issued on October 2, 2015.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

* **Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 1st day of August, 2019

THIS APPROVAL WAS MAILED
ON AUG 0 2 2019
(Signed)

A. Ahmed

Aziz Ahmed, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

CA/
c: District Manager, MECP Ottawa
Clerk, City of Ottawa
Jeff McEwen, P. Eng., Manager, Development Review East Branch, City of Ottawa
William Curry, C.E.T., Planning, Infrastructure and Economic Development, City of Ottawa
Brent Strachan, A.S.O., Minto Communities Inc.
Jennifer Ailey, David Schaeffer Engineering Ltd.

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 7375-A8QGEU
Issue Date: April 12, 2016

City of Ottawa
800 Green Creek Drive
Ottawa, Ontario
K1J 1K6

Site Location: Tenth Line Pump Station
2428 Tenth Line Road
Lot Pt. 3, Concession 11
Geographic Township of Cumberland
City of Ottawa

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

amendment to the wastewater infrastructure Works to include modifications in an existing sewage Works (identified under "Previous Works"), consisting of sanitary sewer, sewage pumping station and forcemain as follows:

Proposed Works:

Revisions to the Tenth Line Pump Station, consisting of the following:

- revised tributary drainage area to include the addition of 32 hectares (ha) of Mattamy Summerside West Lands, 23 ha of Minto Urban Expansion Lands and 15.6 Ha of future development lands (Mer Blue Expansion Area 10);

- installation of a new reversed slope 1050 mm diameter concrete sanitary overflow pipe (from Station 0+000.000 to Station 0+036.141) connecting existing sanitary MH 10128 to proposed storm MH 700, discharging overflow to the existing Avalon West (N5) Stormwater Management Pond;

- installation of a new 2400 mm diameter monitoring manhole for access to a velocity-area type flow meter for overflow monitoring that is connected to the sanitary pumping station and the City of Ottawa SCADA network;

- installation of an ultrasonic depth sensor in the existing sanitary MH 10128 that is connected to the sanitary pumping station and the City of Ottawa SCADA network;

- decommissioning of existing overflows from sanitary MH 512 on Harvest Valley Avenue, sanitary MH 284 on Frank Cauley Way and Sanitary MH 100A at the intersection of Brian Coburn Boulevard and Strasbourg Street;

Previous Works:

Inlet Gravity Sanitary Sewer

A 675 mm diameter inlet gravity concrete sanitary sewer constructed on Tenth Line Road servicing Avalon South Subdivision (N4), from Street 31 (80 m south of the pump station) and a stubbed section of gravity sewer for future connection from Neighbourhood 5 (N5) and the Bilberry Creek Industrial Park (BCIP);

Sewage Pump Station

A sanitary sewage pump station with a rated firm capacity of 425 L/s constructed to serve the N4, N5, and the BCIP, comprising of an in-ground cast-in-place wet well located on East side of Tenth Line Road, 2000 m south of Innes Road consisting of the following:

- A cast-in-place bypass chamber located immediately upstream of the wetwell, equipped with two (2) aluminium air vents, flushing connection, isolation valve, pump rails, and process piping;

- Sewage in-flow to the wetwell is directed through an aluminium trash basket;

- A cast-in-place wetwell equipped with three (3) 45 kW (60 HP) submersible pumps (two duty and one standby) of the non-clog type, each pump is capable of pumping up to 170 L/s in the smallest forcemain at 20 m TDH, complete with soft starters, an ultrasonic transducer for liquid level measurement and pump control together with a Multitrode sensor as backup;

- The wetwell is equipped with two (2) aluminum vents, complete with bird screens and one (1) external blower for ventilation;

- The valve room located in the basement is equipped with a common header, which splits into two forcemains (300 mm and 400 mm), equipped with two (2) electromagnetic flow meters, pressure surge relief valve, and swab launcher for forcemain cleaning;

- A 200 kW diesel engine generator set for standby power during emergencies located within the existing above ground control building, including a 1250 L capacity fuel storage facility located with a spill containment area;

- An offsite overflow connection located at the intersection of Street 6 and Street 31 from sanitary sewer (SAMH511) to the storm sewer (STMH543) with an emergency overflow float alarm at the wetwell;

- The control building has electrical and control equipment, including a new Supervisory Control and Data Acquisition (SCADA) system;

- The station is equipped with a 100 mm diameter watermain complete with backflow prevention for washroom facilities; yard hydrant and flushing connection in the bypass chamber constructed 300 mm above the overflow elevation;

Sewage Forcemains

Two parallel polyvinyl chloride (PVC) sanitary forcemains, 300 mm and 400 mm diameter, constructed from the control building to the west side of Tenth Line Road. The forcemains convey flow north 300 m to Street 45 (Vista Park Drive) in the Avalon South Subdivision, where the sewage outlets to a gravity trunk sewer;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

All in accordance with the submitted Environmental Compliance Approval (ECA) application dated (1) March 03, 2016, including all other supporting documents prepared by David Schaeffer Engineering Ltd., and (2) dated July 5, 2005, including all other supporting documents prepared by Stantec Consulting Limited, forming part of this approval.

For the purpose of this environmental compliance approval, the following definitions apply:

"Act" means the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended;

"Approval" means this entire document including the application and any supporting documents listed in any schedules in this Approval;

"BOD5" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"Director" means a person appointed by the Minister pursuant to section 5 of the Environmental Protection Act for the purposes of Part II.1 of the Environmental Protection Act;

"E. Coli" refers to the thermally tolerant forms of Escherichia that can survive at 44.5 degrees Celsius;

"Emergency Situation" means a structural, mechanical or electrical failure that causes a temporary reduction in the capacity of the Sewage Pumping Station or an unforeseen flow condition that may result in:

a) danger to the health or safety of any person; or
b) injury or damage to any property, or serious risk of injury or damage to any property.

"EPA" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;

"Event" in the context the Sewage Pumping Station located outside the Sewage Treatment Plant, means an

action or occurrence, at the Sewage Pumping Station that causes a Sewage Pumping Station Overflow. An Event ends when there is no recurrence of a Sewage Pumping Station Overflow in the 12-hour period following the last Sewage Pumping Station Overflow. Two Events are separated by at least 12 hours during which there has been no recurrence of a Sewage Pumping Station Overflow;

"Limited Operational Flexibility" (LOF) means the Modifications that the Owner is permitted to make to the Works under this Approval;

"Ministry" means the ministry of the government of Ontario responsible for the Environmental Protection Act and the Ontario Water Resources Act and includes all officials, employees or other persons acting on its behalf;

"Notice of Modifications" means the form entitled "Notice of Modifications to Sewage Works" included in Schedule "A";

"Owner" means City of Ottawa and includes its successors and assignees;

"Previous Works" means those portions of the sewage Works previously approved under an Approval;

"Professional Engineer" means a person entitled to practise as a Professional Engineer in the Province of Ontario under a licence issued under the Professional Engineers Act;

"Sewage Pumping Station Overflow" means any discharge from a Sewage Pumping Station located outside the Sewage Treatment Plant that does not undergo any treatment or only receives partial treatment before it is discharged to the environment;

"Substantial Completion" has the same meaning as "substantial performance" in the Construction Lien Act;

"Works" means the sewage works described in the Owner's application(s) and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the Conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

(3) Where there is a conflict between a provision of any submitted document referred to in this Approval

and the Conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such Condition to other circumstances and the remainder of this Approval shall not be affected thereby.

(6) The issuance of, and compliance with the Conditions of this Approval does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority necessary to construct or operate the sewage Works; or

(b) limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

2. EXPIRY OF APPROVAL

(1) This Approval will cease to apply to those parts of the Works which have not been constructed within **five (5) years** of the date of this Approval.

3. CHANGE OF OWNER

(1) The Owner shall notify the Director, in writing, of any of the following changes within **thirty (30) days** of the change occurring:

(a) change of Owner;

(b) change of address of the Owner;

(c) change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c. B17 shall be included in the notification to the Director;

(d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the Director.

4. UPON THE SUBSTANTIAL COMPLETION OF THE WORKS

(1) Upon the Substantial Completion of the Works, the Owner shall prepare a statement, certified by a Professional Engineer, that the Works are constructed in accordance with this Approval, and upon request, shall make the written statement available for inspection by Ministry personnel.

(2) Within **one (1) year** of the Substantial Completion of the Works, a set of as-built drawings showing the Works "as constructed" shall be prepared. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the Works for the operational life of the Works.

5. SEWAGE PUMPING STATION OVERFLOW

(1) Any Sewage Pumping Station Overflow is prohibited, except:

(a) in an Emergency Situation;

(b) where the Sewage Pumping Station Overflow is a direct and unavoidable result of a planned maintenance procedure, the Owner notified the Water Supervisor **fifteen (15) days** prior to the Sewage Pumping Station Overflow and the Water Supervisor has given written consent of the Sewage Pumping Station Overflow; or,

(c) where the Sewage Pumping Station Overflow is planned for research or training purposes, the discharger notified the Water Supervisor **fifteen (15) days** prior to the Sewage Pumping Station Overflow and the Water Supervisor has given written consent of the Sewage Pumping Station Overflow.

(2) The Owner shall forthwith notify the Spills Action Centre (SAC) at 1-800-268-6060 or e-mail at moe.sac.moe@ontario.ca and the Medical Officer of Health of every Sewage Pumping Station Overflow Events. This notice shall include, at a minimum, the following information:

(a) the date and time at which the Event(s) started,

(b) duration of the Event(s);

(c) the location of the Event(**s**);

(d) the measured or estimated volume of the Event(s) (unless the Event(s) is/are ongoing); and

(e) the reason for the Event (s).

(3) The Owner shall submit Sewage Pumping Station Overflow Event Reports to the Ministry's local office on an Annual basis, no later than forty-five (45) days following the end of the calendar year covered by the Event Report. Event Reports may be in an electronic format specified by the Ministry. In each Event Report the Owner shall include, at a minimum, the following information on any Event(s)

that occurred:

(a) the date and time at which the Event(s) started,

(b) duration of the Event(s);

(c) the location of the Event(**s**);

(d) the measured or estimated volume of the Event(s) (unless the Event(s) is/are ongoing); and

(e) the reason for the Event(s).

(4) The Owner shall use best efforts to collect a representative sample consisting of a minimum of two (2) grab samples of the Sewage Pumping Station Overflow and have it analysed for parameters outlined in Table 1 of Condition 7 (2) using the protocols specified in Condition 7 (3), one at the beginning of the Event and the second approximately near the end of the Event, to best reflect the effluent quality of such Sewage Pumping Station Overflow.

(5) The Owner shall maintain a record of all Sewage Pumping Station Overflow(s), which shall contain, at a minimum, the types of information set out in Condition 5 (2 a) to 5 (2 e) in respect of each Sewage Pumping Station Overflow.

6. OPERATION AND MAINTENANCE

(1) The Owner shall exercise due diligence in ensuring that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this Approval and the Act and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.

(2) The Owner shall prepare an operations manual within **six (6) months** of Substantial Completion of the Works, that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the Works;

(b) inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the Works;

(d) procedures for the inspection and calibration of monitoring equipment;

(e) a spill prevention control and countermeasures plan, consisting of contingency plans and

procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the Water Supervisor; and

(f) procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

(3) The Owner shall maintain the operations manual current and retain a copy at the location of the Works for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

(4) The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

7. MONITORING AND RECORDING

The Owner shall, upon the issuance of this Approval, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analysed for each parameter listed and all results recorded:

Table 1 - Monitoring during a Sewage Pumping Station Overflow Event (Samples to be collected from the Sewage Pumping Station Overflow stream near the Sewage Pumping Station)	
Sample Type	Grab
Parameters	BOD5, Total Suspended Solids, Total Phosphorus, E. Coli

(3) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.

8. REPORTING

(1) **Fifteen (15) days** prior to the date of a planned Sewage Pumping Station Overflow being conducted pursuant to Condition 5 and as soon as possible for an unplanned Sewage Pumping Station Overflow, the Owner shall notify the Water Supervisor in writing of the pending start date, in addition to an assessment of the potential adverse effects on the environment and the duration of the Sewage Pumping Station Overflow.

(2) In addition to the obligations under Part X of the Environmental Protection Act, (which includes contacting the Spills Action Centre (SAC) at 1-800-268-6060 or e-mail at moe.sac.moe@ontario.ca), the Owner shall, within **ten (10) working days** of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, Bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, (with the exception of a sanitary sewage discharged during an Event), submit a full written report of the occurrence to the Water Supervisor describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(3) The Owner shall prepare and submit a report to the Water Supervisor on an annual basis. The reports shall contain the following information:

(a) a copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule A, Section 1 (Limited Operational Flexibility) with a status report on the implementation of each modification;

(b) a report summarizing all modifications completed as a result of Schedule A, Section 3.

9. LIMITED OPERATIONAL FLEXIBILITY

(1) The Owner may make modifications to the Works in accordance with the Terms and Conditions of this Approval and subject to the Ministry's "Limited Operational Flexibility Criteria for Modifications to Sewage Works", included under Schedule A of this Approval, as amended.

(2) Sewage works proposed under Limited Operational Flexibility shall adhere to the design guidelines contained within the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended.

(3) The Owner shall ensure at all times, that the Works, related equipment and appurtenances which are installed or used to achieve compliance are operated in accordance with all Terms and Conditions of this Approval.

(4) For greater certainty, the following are not permitted as part of Limited Operational Flexibility:

(a) Modifications to the Works that result in an increase of the Rated Capacity of the Works;

(b) Modifications to the Works that may adversely affect the approved effluent quality criteria or the location of the discharge/outfall;

(c) Modifications to the Works approved under s.9 of the EPA, and

(d) Modifications to the Works pursuant to an order issued by the Ministry.

(5) Implementation of Limited Operational Flexibility is not intended to be used for piecemeal measures that result in major alterations or expansions.

(6) If the implementation of Limited Operational Flexibility requires changes to be made to the Emergency Response, Spill Reporting and Contingency Plan, the Owner shall, as deemed necessary in consultation with the Water Supervisor, provide a revised copy of this plan for approval to the local fire services authority prior to implementing Limited Operational Flexibility.

(7) For greater certainty, any alteration made under the Limited Operational Flexibility may only be carried out after other legal obligations have been complied with including those arising from the Environmental Protection Act, Niagara Escarpment Planning and Development Act, Oak Ridges Moraine Conservation Act, Lake Simcoe Protection Act and Greenbelt Act.

(8) Prior to implementing Limited Operational Flexibility, the Owner shall complete a Notice of Modifications describing any proposed modifications to the Works and submit it to the Water Supervisor.

10. TEMPORARY EROSION AND SEDIMENT CONTROL

(1) The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every **two (2) weeks** and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

(2) The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

11. RECORD KEEPING

(1) The Owner shall retain for a minimum of **five (5) years** from the date of their creation, all records and information related to or resulting from the operation and maintenance activities required by this Approval.

SCHEDULE 'A'

Limited Operational Flexibility Criteria for Modifications to Sewage Works

1. The modifications to sewage works approved under an Environmental Compliance Approval (Approval) that are permitted under the Limited Operational Flexibility (LOF), are outlined below and are subject to the LOF conditions in the Approval, and require the submission of the Notice of Modifications. If there is a conflict between the sewage works listed below and the Terms and Conditions in the Approval, the Terms and Conditions in the Approval shall take precedence.

1.1 Sewage Pumping Stations

a. Adding or replacing equipment where new equipment is located within an existing sewage pumping station site, provided that the facility Rated Capacity is not exceeded and the existing flow process and/or treatment train are maintained, as applicable.

1.2 Pilot Systems

a. Installation of pilot systems for new or existing technologies provided that:
   i. any effluent from the pilot system is discharged to the inlet of the sewage pumping station or hauled off-site for proper disposal,
   ii. any effluent from the pilot system discharged to the inlet of the sewage pumping station or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
   iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and Water Supervisor three months after completion of the pilot project.

2. Sewage works that are exempt from section 53 of the OWRA by O. Reg. 525/98 continue to be exempt and are not required to follow the notification process under this Limited Operational Flexibility.

3. Normal or emergency operational modifications, such as repairs, reconstructions, or other improvements that are part of maintenance activities, including cleaning, renovations to existing approved sewage works equipment, provided that the modification is made with Equivalent Equipment, are considered pre-approved.

4. The modifications noted in section (3) above are not required to follow the notification protocols under Limited Operational Flexibility, provided that the number of pieces and description of the equipment as described in the Approval does not change.

Ontario
Ministry of
the Environment

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL) OR DISTRICT MANAGER (FOR NON-MUNICIPAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number, issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)

ECA Owner	Municipality

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Description shall include:

1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:

1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Conforms with the Limited Operational Flexibility as per the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act, and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate.

Name (Print)	PEO License Number

Signature	Date (mm/dd/yy)

Name of Employer

Part 4 – Declaration by Owner

I hereby declare that:
1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. These modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.
I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate.

Name of Owner Representative (Print)	Owner representative's title (Print)
Owner Representative's Signature	Date (mm/dd/yy)

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this Approval the existence of this Approval.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included to ensure that the Works are constructed in accordance with the Approval and that record drawings of the Works "as constructed" are maintained for future references.

5. Conditions 5 and 7 are included to indicate that Sewage Pumping Station Overflow of untreated and/or partially treated sewage to the environment is prohibited, save in certain limited circumstances where the failure to do so could result in greater injury to the public interest than the Sewage Pumping Station Overflow itself, or where the Sewage Pumping Station Overflow can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the *Owner* is aware of the extent and frequency of Sewage Pumping Station Overflow Event(s).

6. Condition 6 is included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner and made available to the Ministry. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the Works.

7. Condition 8 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

8. Condition 9 is included to ensure that the Works are operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider. These conditions are also included to ensure that a Professional Engineer has reviewed

the proposed Modifications and attests that the Modifications are in line with that of Limited Operational Flexibility, and provide assurance that the proposed Modifications comply with the Ministry's requirements stipulated in the terms and conditions of this Approval, Ministry policies, guidelines, and industry engineering standards and best management practices.

9. Condition 10 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction, until they are no longer required.

10. Condition 11 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 6338-6EVJJ8 issued on August 3, 2005

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 12th day of April, 2016

Gregory Zimmer, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MS/

c: District Manager, MOECC Ottawa office
Water Supervisor, MOECC Ottawa Office
Jennifer Ailey, David Schaeffer Engineering Ltd.
Charles Warnock, City of Ottawa
Linda Carkner, Program Manager, City of Ottawa, Infrastructure Services

Content Copy Of Original

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 0606-AHXJCH
Issue Date: February 2, 2017

Minto Communities Inc.
180 Kent Street, Suite 200
Ottawa, Ontario
K1P 0B6

Site Location: Avalon West, Stage 5
3100 Brian Coburn Boulevard
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act , R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

storm and sanitary sewers to be constructed in the City of Ottawa, as follows;

storm sewers on Decoeur Drive (from Station 14+443 to Station +15+056.5), Park Number 2 (from MH 142 to MH 5566), Future School Number 3 (from MH 134 to MH 5561), Hepatica Way (from Station 16+466 to Station 16+541.5 and from Station 16+545.5 to Station +16+773.5), Hyssop Street (from Station 18+516.5 to Station 18+730.5), Mountain Sorrel Way (from Station 20+091.5 to Station 20+380, from Station 20+391.5 to Station 20+571.5, and from Station 20+626 to Station 20+756.5), June Grass Street (from Station 12+089.5 to Station 21+307.5), Vendome Street (from Station 26+092.5 to Station 26+220.5), Maskinonge Crescent (from Station 27+088 to Station 27+242.5 and from Station 27+250.5 to Station 27+453), L'Esturgeon Street (from Station 30+047.5 to Station 30+510), Walkway Easement (from MH 5590 to MH W-FS), and Malachigan Crescent (from Station 31+092.5 to Station 31+372.5); and

sanitary sewers on Jerome Jodoin Drive (from Station 1+299.5 to Station 1+490), Decoeur Drive (from Station 14+441.5 to Station 15+056.5), Park Number 2 (from MH 42 to MH 5052), Future School Number 2 (from Stub 22 to MH 5030), Hepatica Way (from Station 16+468.5 to Station 16+772), Hyssop Street (from Station 18+518 to Station 18+729), Mountain Sorrel Way (from Station 20+089 to Station 20+573 and from Station 20+625 to Station 20+755), June Grass Street (from Station 21+091 to Station 21+306), Vendome Street (from Station 26+091 to Station 26+219), Maskinonge Crescent (from Station 27+091 to Station 27+450), L'Esturgeon Street (from Station 30+046 to Station 30+507.5), and Malachigan Crescent (from Station 31+091 to Station 31+374;

all in accordance with the application from Minto Communities Inc., dated January 11, 2017, including final plans and specifications prepared by Atrel Engineering Ltd., Consulting Engineers.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;

2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and Climate Change 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 2nd day of February, 2017

Gregory Zimmer, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

DG/
c: District Manager, MOECC Ottawa
Jeff McEwen, Manager, City of Ottawa (File No. D07-16-09-0018)
Linda Carkner, City of Ottawa, Program Manager, Infrastrucure Services
M. Rick O'Connor, City Clerk, City of Ottawa
Andre Sauve, P.Eng., Atrel Engineering Ltd.

Content Copy Of Original

ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 8605-AYUHJG
Issue Date: May 30, 2018

Minto Communities Inc.
180 Kent Street, Suite 200
Ottawa, Ontario
K1P 0B6

Site Location: Avalon Encore – Stage 6
2336 Tenth Line Road
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the establishment of wastewater infrastructure Works located in the City of Ottawa, consisting of the following:

storm sewers on Décoeur Drive (from Station 14+084 to Station 14+443), Gardenpost Terrace (from Station 29+418 to Station 29+715), Guppy Grove (Station 33+095 to Station 33+231), Sculpin Street (from Station 37+085 to Station 37+222), Damselfish Walk (from Station 32+099.5 to Station 32+321.5), Aquarium Avenue (from Station 33+243 to Station 34+251), Stickleback Way (from Station 36+089.5 to Station 36+371), Shiner Lane (from Station 35+094 to Station 35+166), Commercial lot 2575 Mer Bleue storm services off Aquarium Avenue, the proposed park and Future Site Plan services off Gardenpost Terrace, discharging to existing municipal sewage system, located on Jerome Jodoin Drive; and

sanitary sewers on Décoeur Drive (from Station 14+089 to Station 14+441), Gardenpost Terrace (from Station 29+420.5 to Station 30+012.5), Guppy Grove (from Station 33+091 to Station 33+248), Sculpin Street (from Station 33+088 to Station 37+220), Damselfish Walk (from Station 32+101 to Station 32+319), Aquarium Avenue (from Station 33+248 to Station 34+243.5), Shiner Lane (from Station 35+091.5 to Station 33+170.5), Jerome Jodoin Drive (from Station 1+854 to Station 1+490), Commercial lot 2575 Mer Bleue sanitary service off Aquarium Avenue, the proposed park, the Future Site Plan services off Gardenpost Terrace and Future School services, discharging to existing sanitary sewers, located on Décoeur Drive; and

ditches on Mer Bleue Road (from Station 8+450 to Station 8+635 (West) and

from Station 9+490 to Station 8+620 (East)) to be re-directed towards the proposed deep inlet catch basin 6 and 7, deep inlet catch basin 4 to be constructed on Mer Bleue Road (Station 8+422 (East)) to drain existing ditch along Mer Bleue Road (from Station 8+371 to Station 8+422 (East)), discharging to the existing municipal sewage system, located on Jerome Jodoin Drive;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "*Approval*" means this entire document and any schedules attached to it, and the application;
2. "*Director*" means a person appointed by the Minister pursuant to section 5 of the *EPA* for the purposes of Part II.1 of the *EPA*;
3. "*District Manager*" means the District Manager of the appropriate local District Office of the Ministry, where the *Works* are geographically located;
4. "*EPA*" means the *Environmental Protection Act, R.S.O. 1990, c.E.19* , as amended;
5. "*Ministry*" means the ministry of the government of Ontario responsible for the *EPA* and *OWRA* and includes all officials, employees or other persons acting on its behalf;
6. "*Owner*" means Minto Communities Inc., and includes its successors and assignees;
7. "*OWRA*" means the *Ontario Water Resources Act, R.S.O. 1990, c. O.40*, as amended;
8. "*Works*" means the sewage Works described in the *Owner*'s application, and this *Approval*.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITIONS

1. The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Works* is notified of this *Approval* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
2. Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Approval*, and the application for approval of the *Works*.
3. Where there is a conflict between a provision of any document in the schedule referred to in this *Approval* and the conditions of this *Approval*, the conditions in this *Approval* shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.
4. Where there is a conflict between the documents listed in Schedule "A" and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
5. The conditions of this *Approval* are severable. If any condition of this *Approval*, or the application of any requirement of this *Approval* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Approval* shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This *Approval* will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this *Approval*.
2. In the event that completion and commissioning of any portion of the *Works* is anticipated to be delayed beyond the specified expiry period, the *Owner* shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of *Approval* of the *Works* are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The *Owner* shall notify the *District Manager* and the *Director*, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of *Owner*;

    b. change of address of the *Owner*;

    c. change of partners where the *Owner* is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act* , R.S.O. 1990, c.B17 shall be included in the notification to the *District Manager*; or

    d. change of name of the corporation where the *Owner* is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C39 shall be included in the notification to the *District Manager*.

2. In the event of any change in ownership of the *Works*, other than a change to a successor municipality, the *Owner* shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the *District Manager* and the Director.
3. The *Owner* shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

Schedule "A"

1. Application for Environmental Compliance Approval, dated April 25, 2018, received on May 03, 2018, submitted by Minto Communities Inc.;
2. Transfer of Review Letter of Recommendation, dated April 30, 2018, and signed by Josh White, P.Eng., Senior Engineer - Infrastructure Applications, City of Ottawa.
3.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.
2.
3. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.
4.
5. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.
6.
7. Condition 4 is included to prevent the operation of stormwater pipes and other conveyance until such time that their required associated stormwater management Works are also constructed.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the

environmental compliance approval in respect of which the hearing is required, and;

b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or** www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

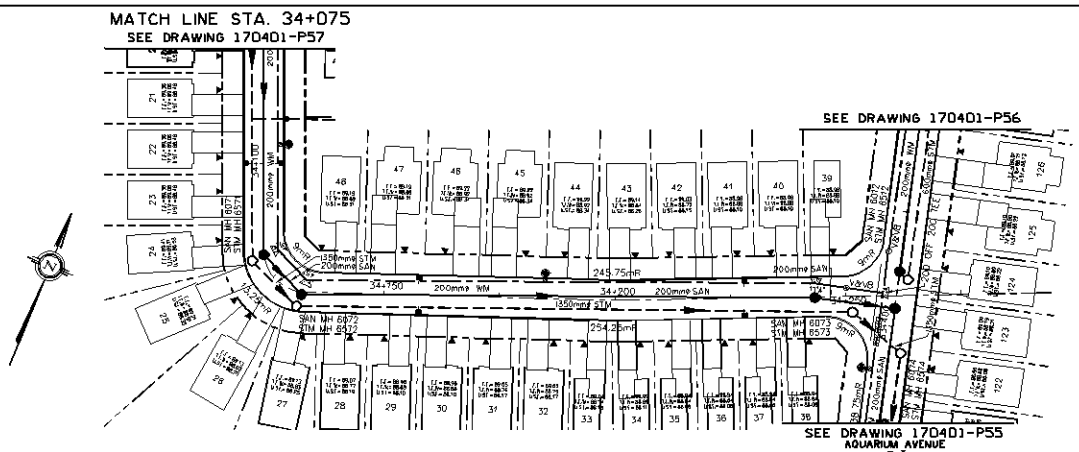
DATED AT TORONTO this 30th day of May, 2018

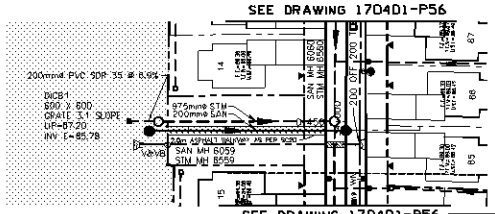
Christina Labarge, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

EV/
c: District Manager, MOECC Ottawa
Clerk, City of Ottawa (File No. D07-16-09-0018)
Linda Carkner, Program Manager, City of Ottawa
Domenic Idone, Director, Minto Communities
Josh White, P.Eng., Senior Engineer - Infrastructure Applications, City of Ottawa

APPENDIX B

Record Drawings





NOTES:

(OW) CUT OFF WALL (1.0m WIDE) SHALL BE INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING SB (SPACED NO MORE THAN 60m APART).

WATERMAIN CROSSING BELOW AND OVER SEWERS SHALL BE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS W25 AND W25.2 RESPECTIVELY.

(SL) SAFETY LANDING AS PER OPSD 404.020

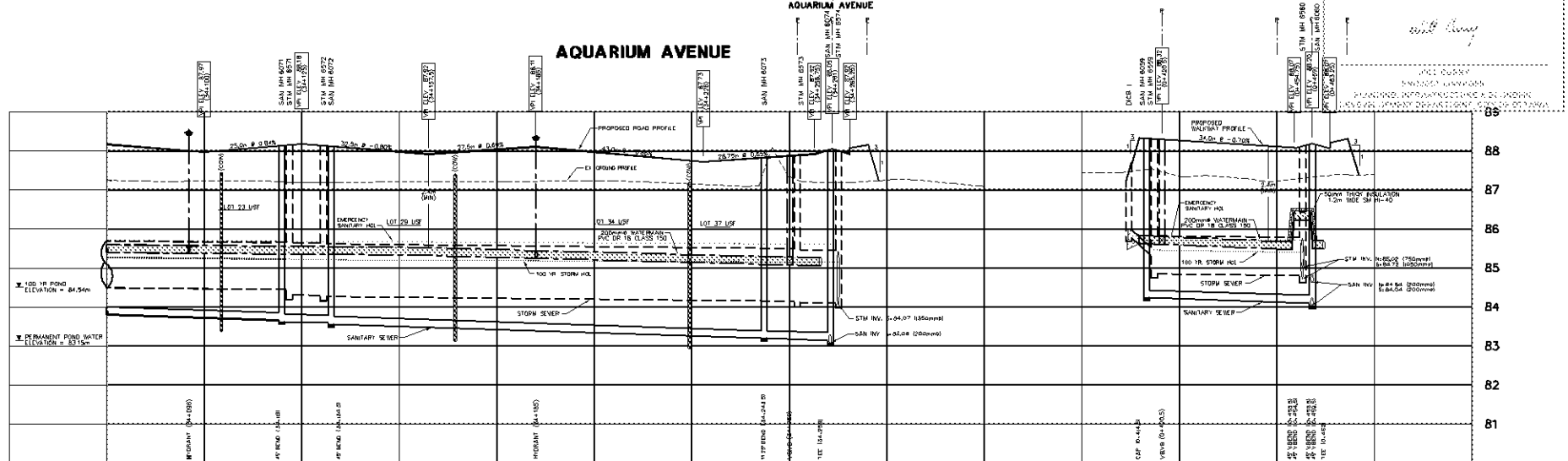
OUTSIDE PROPOSED DEVELOPMENT

REVIEWED
By WC at 6:23 am, May 28, 2018

COMMERCIAL WALKWAY

AQUARIUM AVENUE

AQUARIUM AVENUE



℄ ROAD ELEVATION	
TOP OF WATERMAIN ELEVATION	
STORM SEWER INVERT	71.0m 200mm STM @0.10% CONC 50D; 11.5m 250mm STM @0.0% CONC 50D; 120.0m 450mm STM @0.40% CONC 50D; 14.0m 375mm STM @0.0% CONC 50D; 38.0m 975mm STM @0.0% CONC 50D
SANITARY SEWER INVERT	68.5m 200mm SAN @0.32% PVC SDR 35; 11.5m 200mm SAN @0.32% PVC SDR 35; 111.0m 200mm SAN @0.32% PVC SDR 35; 17.5m 200mm SAN @0.32% PVC SDR 35; 42.5m 200mm SAN @0.47% PVC SDR 35
EXISTING ℄ R.O.W. ELEVATION	
CHAINAGE	34+075, 34+100, 34+120.5, 34+125, 34+132.5, 34+150, 34+175, 34+200, 34+225, 34+243, 34+250, 34+260.5, 34+275, 34+300, 0+400, 0+416.5, 0+425, 0+436.5, 0+450, 0+456.5, 0+475

NOTE.
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
1	AS PER CITY COMMENTS	MAR 16/18	AGS
2	ISSUED FOR TENDER	MAR. 28/18	AGS
3	AS PER CITY COMMENTS	APR. 26/18	AGS
4	ISSUED FOR CONSTRUCTION	MAY 7/18	AGS
5	AS PER CITY COMMENTS	MAY 17/18	AGS

SCALE
1:500
0m 5m 15m
HORIZONTAL
1:50
0.5m 0 1.5m
VERTICAL

DESIGN PLM
CHECKED AGS
DRAWN PNC
CHECKED AGS
APPROVED AGS

LICENCED PROFESSIONAL ENGINEER S.21 PROVINCE OF ONTARIO

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

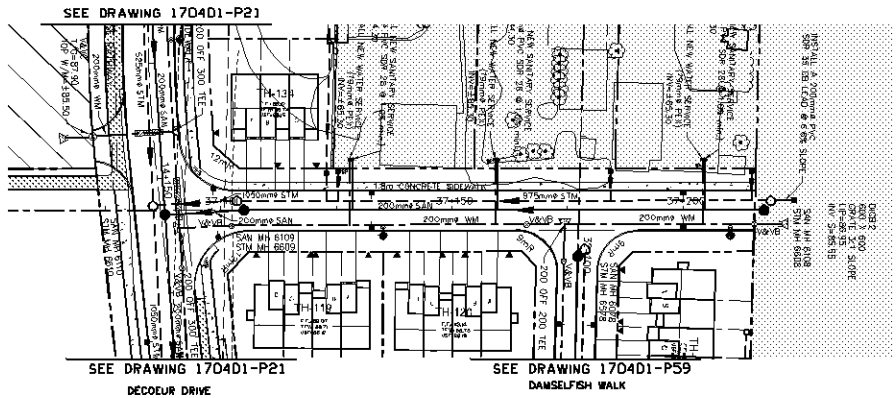
CLIENT No. 148
PROJECT No. 17D401
DRAWING No. 17D401-P58

PLAN AND PROFILE
AQUARIUM AVENUE & COMMERCIAL WALKWAY
STATION 34+075 TO STATION 34+300
STATION 0+400 TO STATION 0+475

D07-16-09-0018-STAGE 6

16796

000099



NOTES:

(CDW) CUT OFF WALL (1.5m WIDE) SHALL BE INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING SB (SPACED NO MORE THAN 60m APART)

WATERMAIN CROSSING BELOW AND OVER SEWERS SHALL BE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS W25 AND W25.2 RESPECTIVELY

(SL) SAFETY LANDING AS PER OPSD 404.020

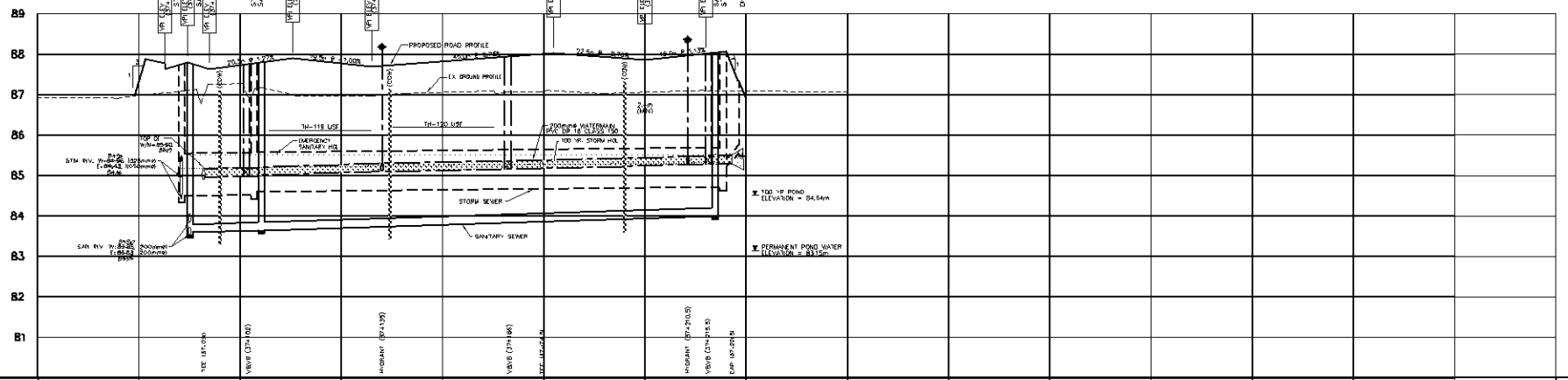
OUTSIDE PROPOSED DEVELOPMENT

RECORD DRAWING

JANUARY 25, 2019

THIS 'RECORD DRAWING' HAS BEEN PREPARED BASED ON INSPECTIONS AND OBSERVATIONS UNDERTAKEN BY ATREL ENGINEERING LTD. STAFF DURING KEY STAGES OF CONSTRUCTION AND ON INFORMATION SUBMITTED, IN PART BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ATREL ENGINEERING LTD. IS NOT RESPONSIBLE FOR ITS ACCURACY OR FOR ERRORS OR OMISSIONS THAT MAY HAVE BEEN INCORPORATED INTO THIS DRAWING AS A RESULT.

SCULPIN STREET



℄ ROAD ELEVATION														℄ ROAD ELEVATION
TOP OF WATERMAIN ELEVATION														TOP OF WATERMAIN ELEVATION
STORM SEWER INVERT														STORM SEWER INVERT
SANITARY SEWER INVERT														SANITARY SEWER INVERT
EXISTING ℄ R.O.W. ELEVATION														EXISTING ℄ R.O.W. ELEVATION
CHAINAGE		37+075			37+100		37+125	37+150		37+175	37+200		37+225	37+250	CHAINAGE

NOTE.
THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM

No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
1	AS PER CITY COMMENTS	APR 26/18	AGS
2	ISSUED FOR CONSTRUCTION	MAY 7/18	AGS
3	AS PER CITY COMMENTS	MAY 17/18	AGS
4	UPDATED WITH PRELIMINARY UTILITY DESIGNS	JUNE 7/18	AGS
5	AS PER UTILITY COMMENTS	JULY 18/18	AGS
6	ISSUED FOR APPROVAL	AUG 2/18	AGS
7	AS PER CITY COMMENTS	AUG. 22/18	AGS
8	RECORD DRAWING	JAN. 31/19	AGS

SCALE
1:500
0m 0 15m
HORIZONTAL
1:50
0.5m 0 1.5m
VERTICAL

DESIGN	PLM
CHECKED	AGS
DRAWN	PNC
CHECKED	AGS
APPROVED	AGS

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

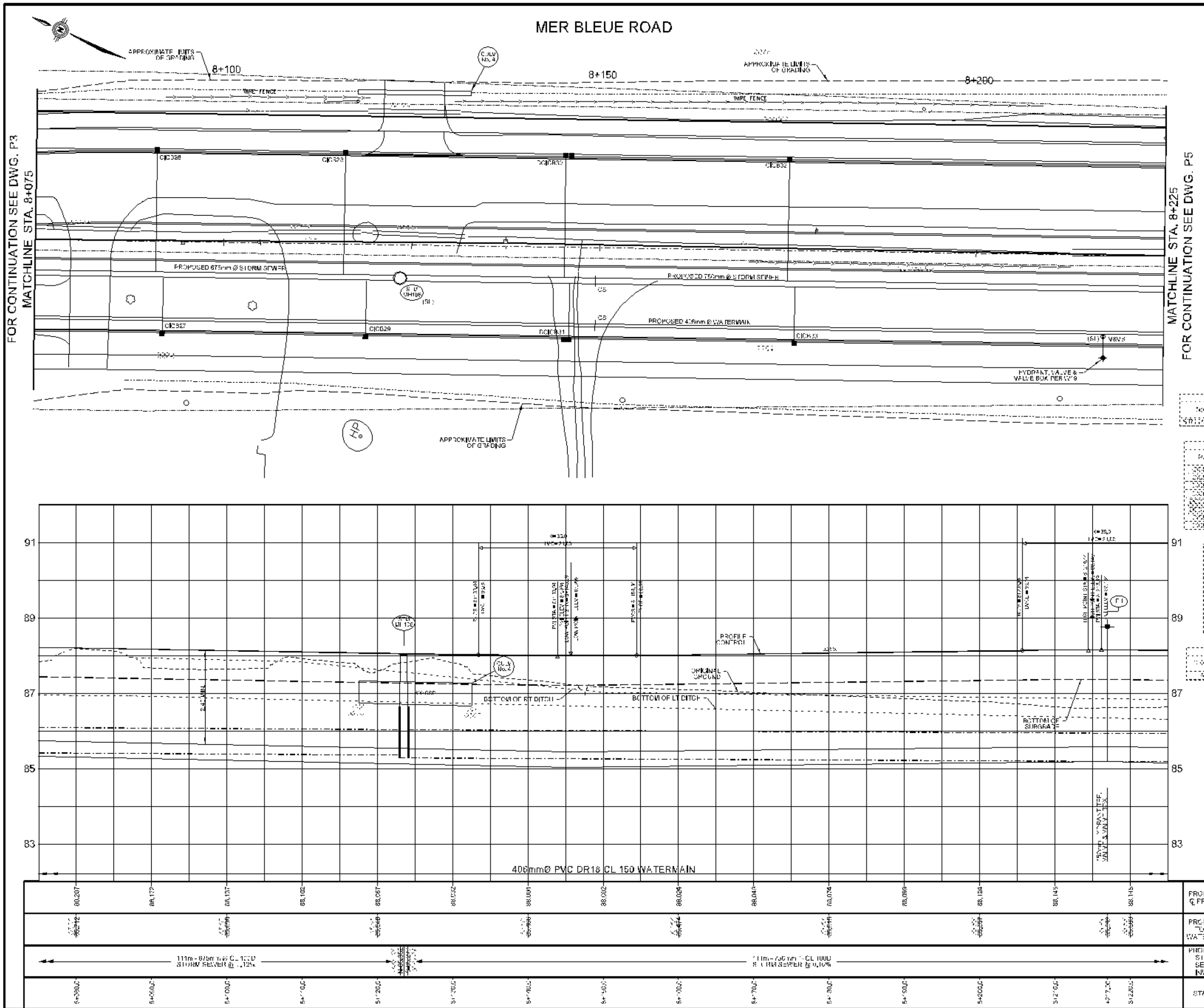
CLIENT No. 148
PROJECT No. 170401
DRAWING No. 170401-P62

PLAN AND PROFILE
SCULPIN STREET
STATION 37+075 TO STATION 37+250

D07-16-09-0018-STAGE 6

16796

000100



MER BLEUE ROAD WIDENING

GRADING & DRAINAGE
MER BLEUE ROAD
STA. 8+075 TO STA. 8+225

Contract No. ISD14-5053
Dwg. No. P4

Robinson Consultants

AS-BUILT

RECORD INFORMATION PROVIDED BY CITY OF OTTAWA

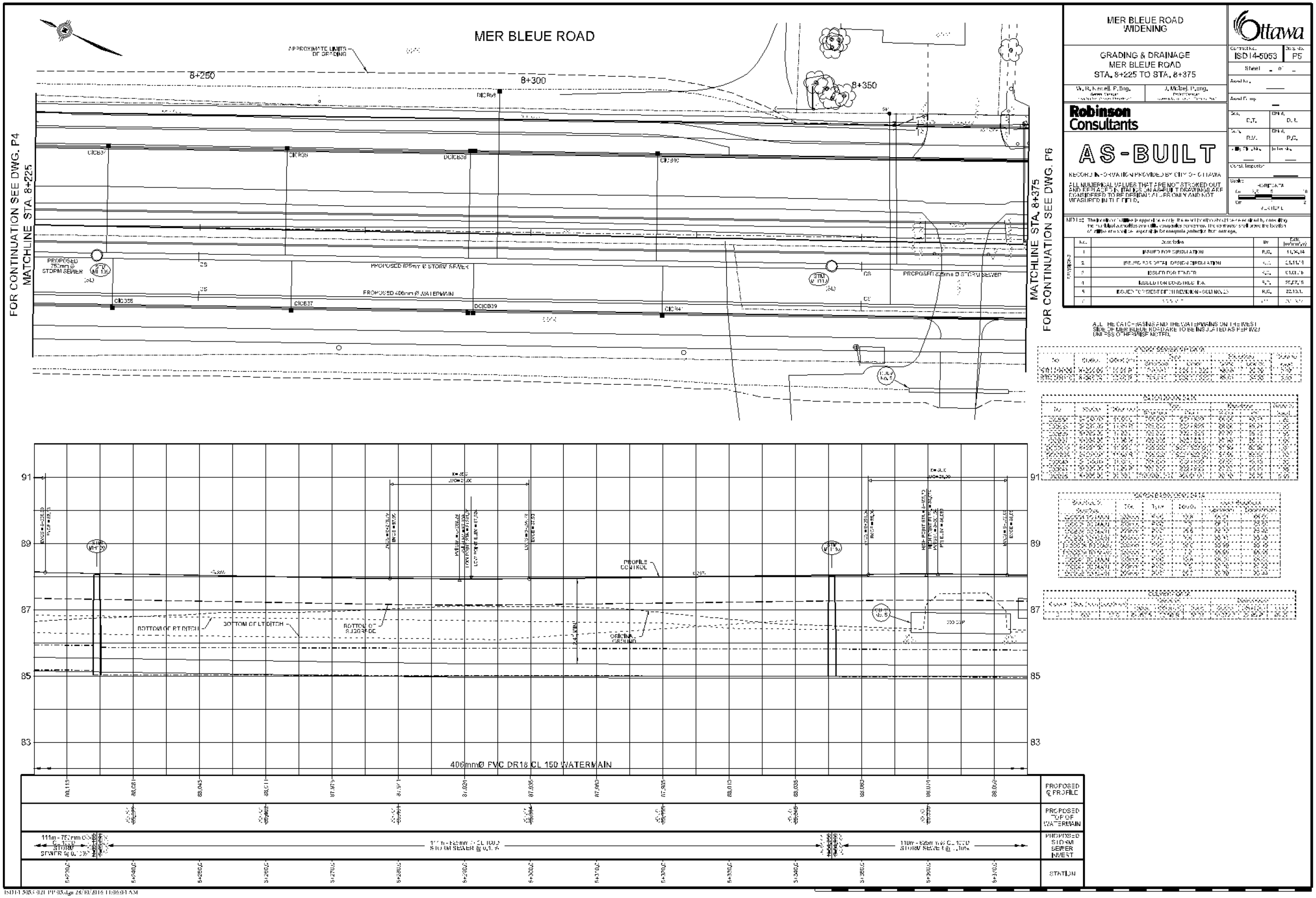
ALL NUMERICAL VALUES THAT ARE NOT STROKED OUT AND REPLACED IN ITALICS ON AS-BUILT DRAWINGS ARE CONSIDERED TO BE DESIGN VALUES ONLY AND NOT MEASURED IN THE FIELD.

No.	Description	By	Date
1	ISSUED FOR CIRCULATION	R.C.	11.04.14
2	ISSUED FOR DETAIL DESIGN CIRCULATION	R.C.	[illegible]
3	ISSUED FOR TENDER	R.C.	[illegible]
4	ISSUED FOR CONSTRUCTION	R.C.	[illegible]
5	ISSUED FOR CULVERT REVISION	R.C.	[illegible]
6	ISSUED FOR WEST DITCH REVISION	R.C.	[illegible]
7	[illegible]	[illegible]	[illegible]

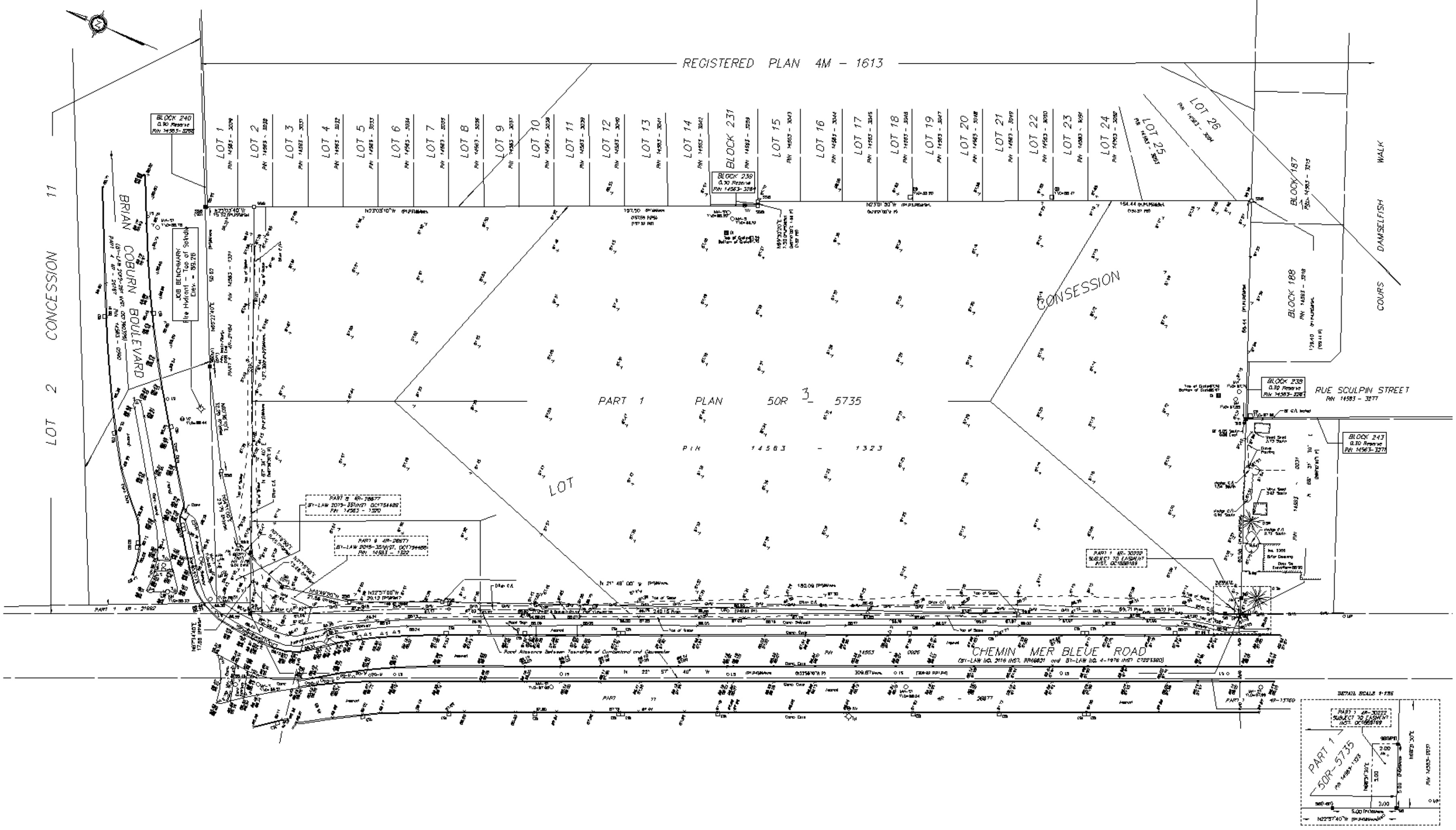
ALL THE CATCH-BASINS AND THE WATERMAINS ON THE WEST SIDE OF MER BLEUE ROAD ARE TO BE INSULATED AS PER W23 UNLESS OTHERWISE NOTED.

ISD14-5053 ... 28/10/2016

000101


MER BLEUE ROAD
WIDENING
GRADING & DRAINAGE
MER BLEUE ROAD
STA. 8+225 TO STA. 8+375
ISD14-5053
P5
Ottawa
Robinson Consultants
AS-BUILT
MER BLEUE ROAD
8+250
8+300
8+350
FOR CONTINUATION SEE DWG. P4
MATCHLINE STA. 8+225
MATCHLINE STA. 8+375
FOR CONTINUATION SEE DWG. P6
PROPOSED 750mm Ø STORM SEWER
PROPOSED 825mm Ø STORM SEWER
PROPOSED 406mm Ø WATERMAIN
ALL THE CATCHBASINS AND THE WATERMAINS ON THE WEST SIDE OF MER BLEUE ROAD ARE TO BE INSULATED AS PER W23 UNLESS OTHERWISE NOTED.
PROFILE CONTROL
BOTTOM OF RT DITCH
BOTTOM OF LT DITCH
BOTTOM OF SUBGRADE
ORIGINAL GROUND
406mmØ PVC DR18 CL 150 WATERMAIN
PROPOSED ℄ PROFILE
PROPOSED TOP OF WATERMAIN
PROPOSED STORM SEWER INVERT
STATION
91
89
87
85
83

000102



TOPOGRAPHICAL PLAN OF SURVEY

PART OF LOTS 2 AND 3
CONCESSION 11
GEOGRAPHIC TOWNSHIP OF CUMBERLAND
CITY OF OTTAWA

Surveyed by Annis, O'Sullivan, Vollebekk Ltd.

Scale 1 : 500

Metric

DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048

Surveyor's Certificate

I CERTIFY THAT:

1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 20th day of September, 2019.

Date

V. Andrew Shelp
Ontario Land Surveyor

Notes & Legend

		Denotes
—□—	-	Survey Monument Planted
—■—	-	Survey Monument Found
SIB	-	Standard Iron Bar
SSIB	-	Short Standard Iron Bar
IB	-	Iron Bar
(Wit)	-	Witness
Prop	-	Proportion
Meas	-	Measured
C/L	-	Centreline
Conc.	-	Concrete
T/G	-	Top of Grade
N/S	-	North/South

Bearings are grid, derived from Can-Net 2016 Real Time Network GPS observations, MTM Zone 9 (76°30' West Longitude) NAD-83 (original).

SITE AREA= 40466.8 m²

ELEVATION NOTES

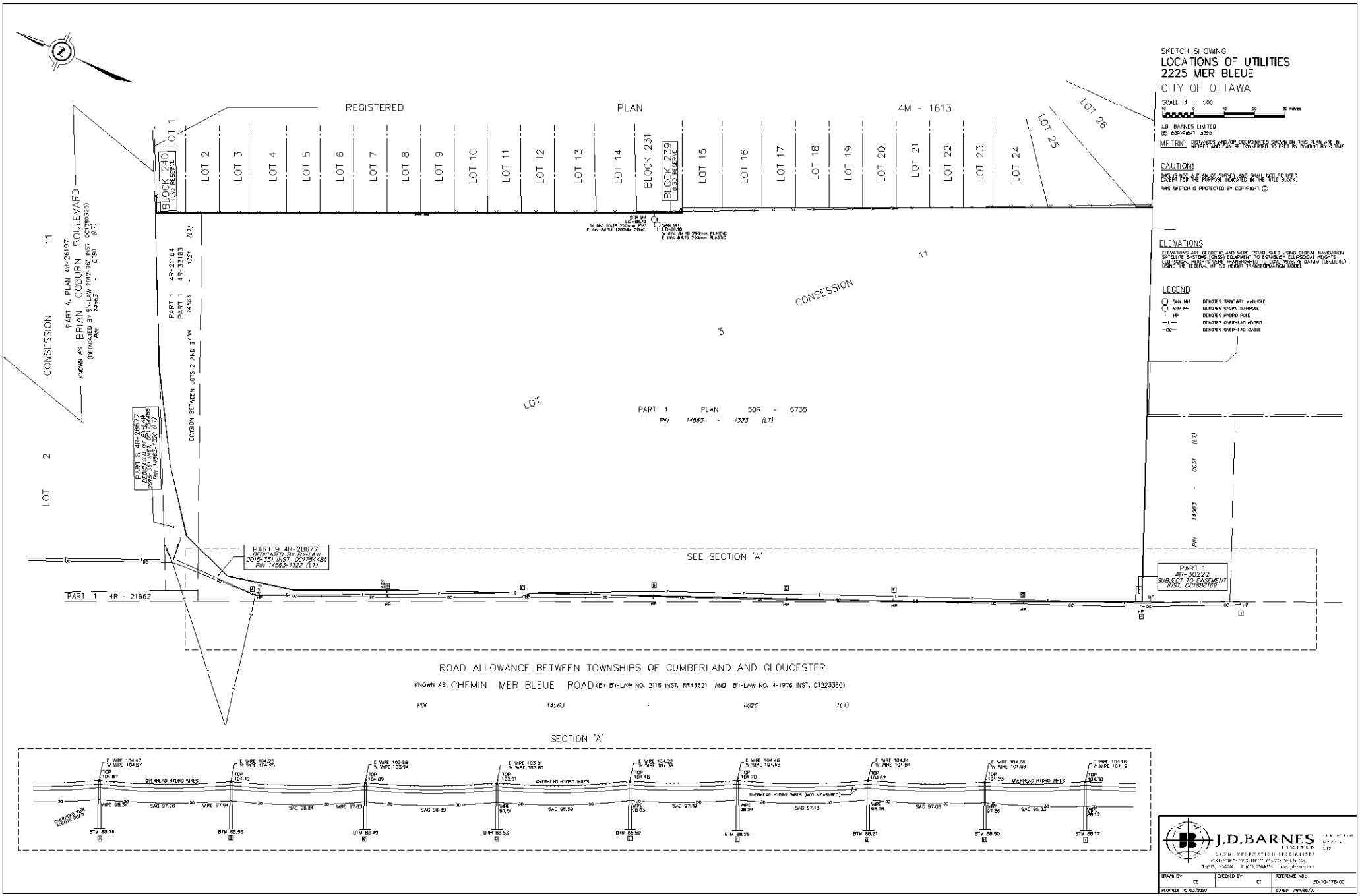
1. Elevations shown are geodetic and are referred to the CGVD28 geodetic datum.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

UTILITY NOTES

1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

© Annis, O'Sullivan, Vollebekk Ltd., 2019. "THIS PLAN IS PROTECTED BY COPYRIGHT"

ANNIS, O'SULLIVAN, VOLLEBEKK LTD.
14 Concourse Gate, Suite 500
Nepean, Ont. K2E 7S6
Ontario Land Surveyors


SKETCH SHOWING
LOCATIONS OF UTILITIES
2225 MER BLEUE
CITY OF OTTAWA
SCALE 1 : 500
J.D. BARNES LIMITED
© COPYRIGHT 2020
METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048
CAUTION!
THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK.
THIS SKETCH IS PROTECTED BY COPYRIGHT ©
ELEVATIONS
ELEVATIONS ARE GEODETIC AND WERE ESTABLISHED USING GLOBAL NAVIGATION SATELLITE SYSTEMS (GNSS) EQUIPMENT TO ESTABLISH ELLIPSOIDAL HEIGHTS. ELLIPSOIDAL HEIGHTS WERE TRANSFORMED TO CGVD-1928:78 DATUM (GEODETIC) USING THE FEDERAL HT 2.0 HEIGHT TRANSFORMATION MODEL
LEGEND
SAN MH DENOTES SANITARY MANHOLE
STM MH DENOTES STORM MANHOLE
HP DENOTES HYDRO POLE
DENOTES OVERHEAD HYDRO
DENOTES OVERHEAD CABLE
REGISTERED PLAN 4M - 1613
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 14
BLOCK 231
BLOCK 239
0.30 RESERVE
LOT 15
LOT 16
LOT 17
LOT 18
LOT 19
LOT 20
LOT 21
LOT 22
LOT 23
LOT 24
LOT 25
LOT 26
BLOCK 240
0.30 RESERVE
CONSESSION 11
CONSESSION 3
LOT 2
PART 4, PLAN 4R-26197
KNOWN AS BRIAN COBURN BOULEVARD
(DEDICATED BY BY-LAW 2012-261 INST. OC1960325)
PIN 14563 - 0580 (LT)
PART 1 4R-21164
PART 1 4R-33183
PIN 14563 - 1327 (LT)
DIVISION BETWEEN LOTS 2 AND 3
PART 8 4R-28677
DEDICATED BY BY-LAW 2015-351 INST. OC1754486
PIN 14563-1320 (LT)
PART 9 4R-28677
DEDICATED BY BY-LAW 2015-351 INST. OC1754486
PIN 14563-1322 (LT)
PART 1 4R-21662
LOT
PART 1 PLAN 50R - 5735
PIN 14563 - 1323 (LT)
SEE SECTION 'A'
PART 1
4R-30222
SUBJECT TO EASEMENT
INST. OC1886169
PIN 14563 - 0031 (LT)
ROAD ALLOWANCE BETWEEN TOWNSHIPS OF CUMBERLAND AND GLOUCESTER
KNOWN AS CHEMIN MER BLEUE ROAD (BY BY-LAW NO. 2115 INST. RR48621 AND BY-LAW NO. 4-1976 INST. CT223380)
PIN 14563 - 0026 (LT)
SECTION 'A'
OVERHEAD HYDRO WIRES
OVERHEAD HYDRO WIRES (NOT MEASURED)
J.D.BARNES
LAND INFORMATION SPECIALISTS
DRAWN BY: CE
CHECKED BY: CT
REFERENCE NO.: 20-10-178-00
PLOTTED: 12/23/2020
DATED: mm/dd/yy

000104

APPENDIX C

Water Supply

Stantec

2275 Mer Bleue Rd: Water Distribution System Analysis

Final Report

April 18, 2022

Prepared for:

Caivan Communities

Prepared by:

Stantec Consulting Ltd.

Revision	Description	Author		Quality Check		Independent Review	
0	Draft	TAW	20220124	JS	20220125	KA	20220125
1	Final	TAW	20220408	JS	20220412	KA	20220414

This document entitled **2275 Mer Bleue Rd: Water Distribution System Analysis** was prepared by Stantec Consulting Ltd. ("Stantec") for the account of David Schaeffer Engineering Ltd. (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by _____
(signature)
Thomas Westwood, M.Eng., P.Eng.

Reviewed by _____
(signature)
Jasmin Sidhu, P.Eng.

Approved by _____
(signature)
Kevin Alemany, M.A.Sc., P.Eng.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

To support Caivan Communities (Caivan) with their detailed design submission for the 2275 Mer Bleue Rd development area, Stantec Consulting Ltd (Stantec) was requested to provide engineering services to complete a water distribution system analysis for this proposed subdivision. The purpose of the analysis is to confirm associated watermain sizing and redundancy needs.

For this assignment, Stantec's scope of work includes the following tasks:

1) Reviewing background information and establishing updated water demands for the development area based on the most current draft plan;
2) Preparing and submitting a boundary condition request to the City;
3) Preparing a stand-alone hydraulic model of the distribution system within the development area using boundary conditions provided by the City;
4) Assessing Fire Underwriters Survey (FUS) fire flow requirements;
5) Setting up and running model simulations for average day (AVDY), peak hour (PKHR), and maximum day (MXDY) plus fire flow demands to identify watermain sizing and redundancy needs required for the water distribution system within the development lands to meet design criteria; and,
6) Documenting the approach used, findings and recommendations from the analysis.

1.1 STUDY AREA

The study area is located immediately east of Mer Bleue Rd and south of Brian Coburn Blvd in Ottawa's east-end Cumberland Ward (Ward 19). The proposed development location is "adjacent to Minto's Avalon Encore – Stage 6 development"[1]. Based on the current site plan provided by Caivan (dated June 2021), the proposed development is to comprise of a total of 123 townhouse (MLT) units (consisting of a combination of standard and back-to-back townhomes) for a total estimated population of 332 persons.

These development lands are proposed to be serviced by three connections to the existing distribution network, all of which are currently part of Zone 2E. These include the following locations as shown in **Figure 1-1**:

1) The existing 200 mm stub off of Aquarium Ave (Connection 1);
2) The existing 200 mm diameter watermain on Sculpin St (Connection 2); and,
3) The existing 400 mm diameter watermain on Mer Bleue Rd (Connection 3).

[1] Functional Servicing Report for 2275 Mer Bleue Road, David Schaeffer Engineering Ltd (2021).

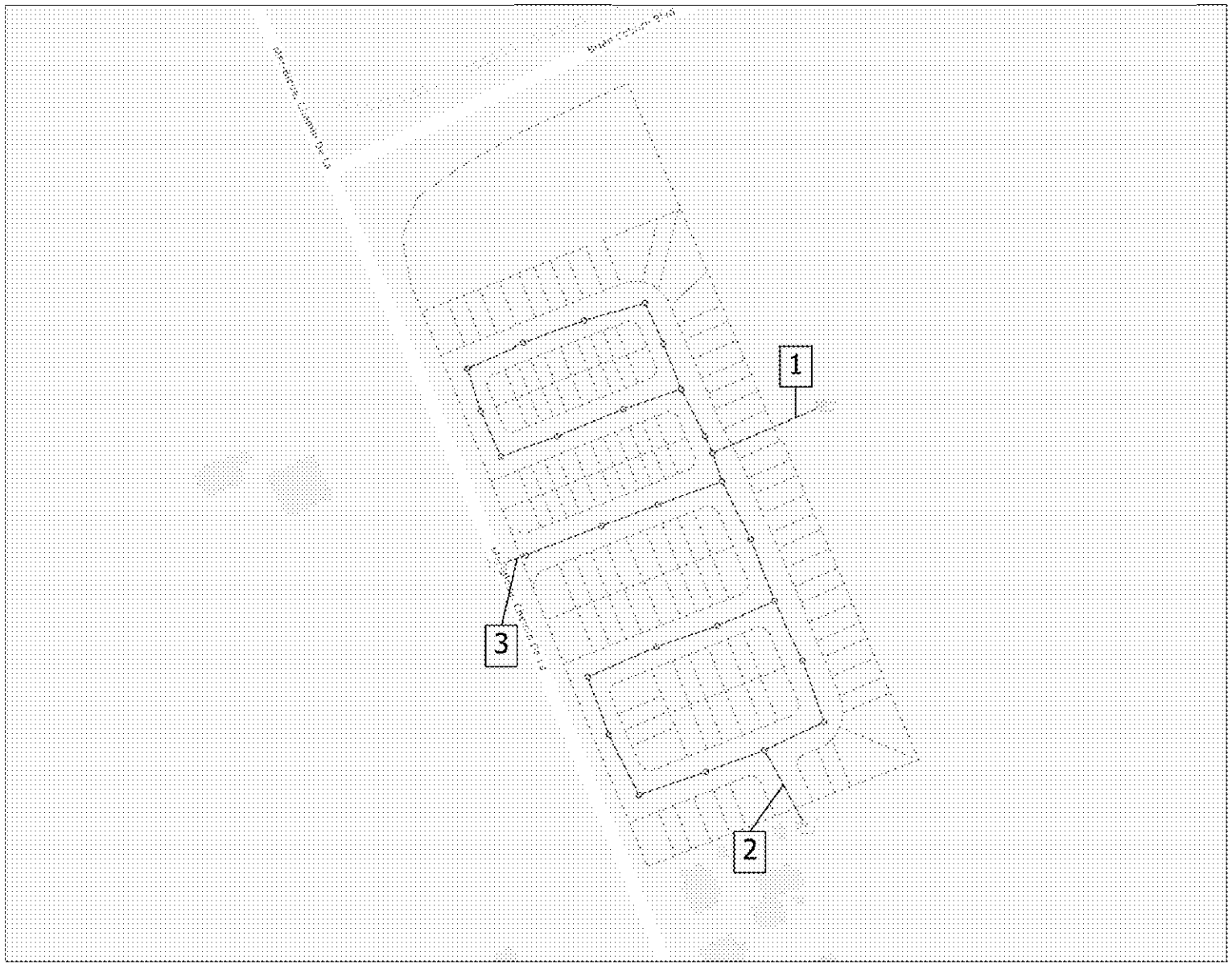


Figure No.
1-1

Title
Connections to Existing Water Distribution Network

Client/Project
Caivan Communities
2275 Mer Bleue

Project Location
2275 Mer Bleue, Ottawa, Ontario, Canada

N

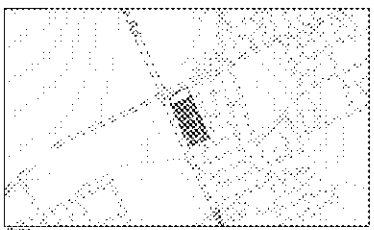
0 25 50 Meters
(At original document size of 11x17)
1:1,750

Legend

1 - Connection at Aquarium Avenue

2 - Connection at Sculpin Street

3 - Connection at Mer Bleue Road



Notes
1. Coordinate System: NAD 1983 MTM 9
2. Background: Esri, Maxar, Geoeye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Stantec

Page 1 of 1

2.0 HYDRAULIC ASSESSMENT

The City of Ottawa Water Design Guidelines (City of Ottawa, 2010) and the Ontario Ministry of Environment, Conservation and Parks (MECP) Design Guidelines for Drinking Water Systems (2019) were used to establish water demands, level of service and pressure objectives during normal and emergency conditions. As per the City's design guidelines and recently issued Tech Bulletin ISTB-2021-03, since this is a new development involving the design of new watermains, the design shall consider a required fire flow established using the long calculation method published by the Fire Underwriters Survey (FUS).

2.1 SERVICEABILITY

2.1.1 System Pressures

As per the City's Water Design Guidelines, the desired range of pressure under average day (AVDY), maximum day (MXDY) and peak hour (PKHR) demands is 345 to 552 kPa (50 to 80 psi) and no less than 276 kPa (40 psi) at ground elevation (i.e., at street level). The maximum pressure at any point in the water distribution system should not exceed 552 kPa (80 psi); pressure reducing measures are required to service areas where pressures greater than 552 kPa (80 psi) are anticipated. Under emergency fire conditions, the system must be able to supply appropriate fire flow while maintaining a residual pressure of 138 kPa (20 psi).

Figure 2-1 shows the elevations of each model junction based on the site's current grading plan. These range from 88.0 m to 88.6 m.

2.1.2 Fire Flows

The City requires a fire flow assessment to be completed to demonstrate that local watermains can provide the objective fire flows. The detailed FUS Guidelines (long method) was used to calculate the objective fire flows. Based on latest site plan information provided, the following characteristics were considered in the FUS calculations:

- All townhouse units will be of typical construction (e.g., wood frame, limited combustible building contents);
- Total area (> 50% above grade) for individual standard and back-to-back townhome units range between 1,560 - 1,657 ft² and 1,228 - 1,294 ft², respectively (refer to **Appendix A**);
- Standard and back-to-back townhome units will have 2 stories above grade (with basements more than 50% below ground level);
- Buildings are not sprinklered; and,
- Minimum setbacks between adjacent standard and back-to-back townhome blocks are as follows: front = 3 m, rear = 6 m, and side (end unit) = 1.5 m.

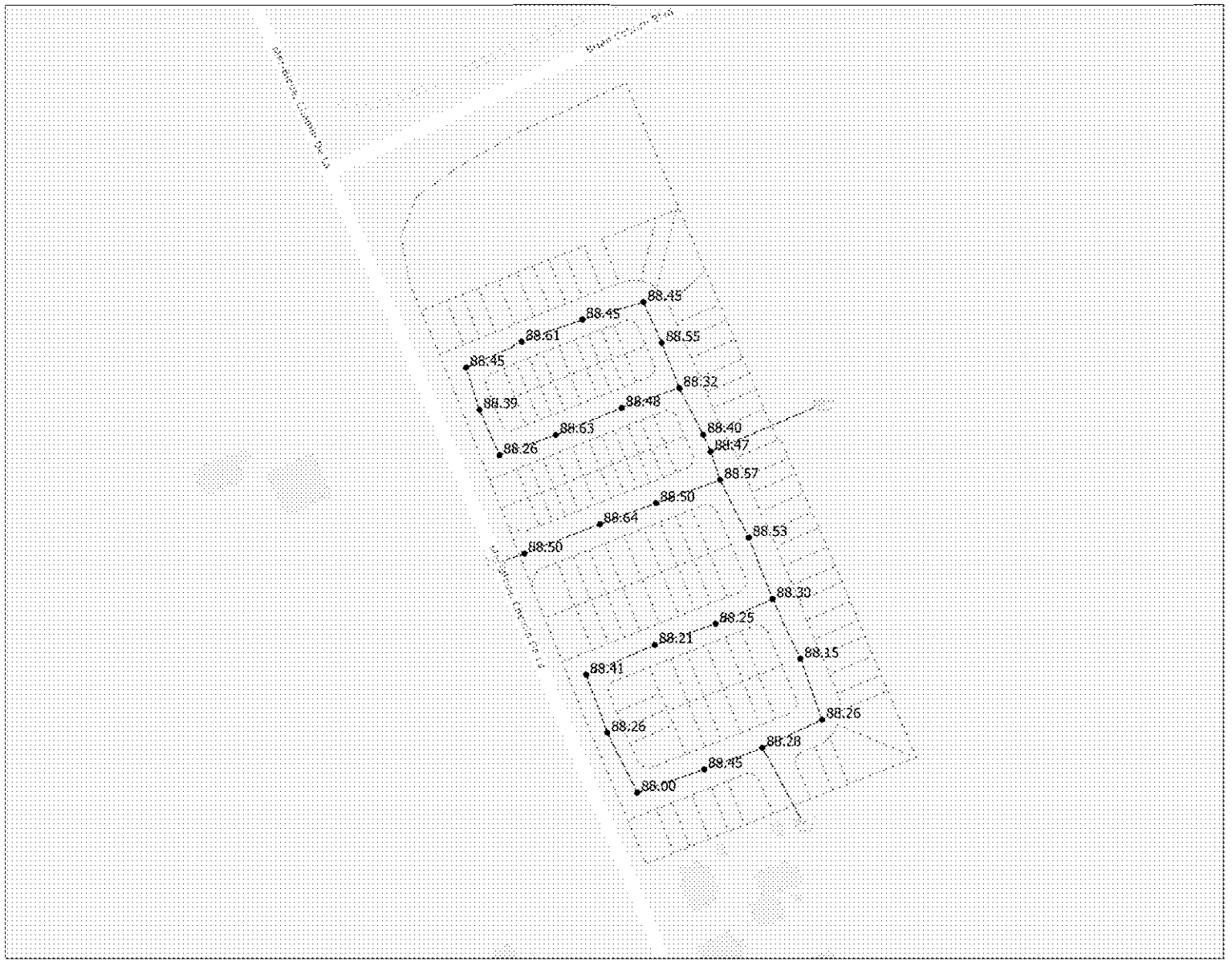


Figure No.
2-1

Title
Junction Elevations

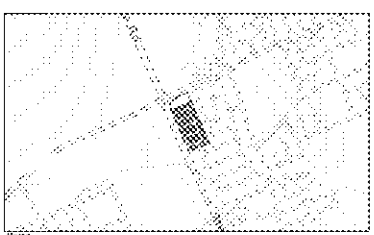
Client/Project
Caivan Communities
2275 Mer Bleue

Project Location
2275 Mer Bleue, Ottawa, Ontario, Canada

N

0 25 50 Meters
(At original document size of 11x17)
1:1,750

Legend



Notes
1. Coordinate System: NAD 1983 MTM 9
2. Background: Esri, Maxar, Geoeye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Stantec

At the time of the submission and receipt of the current boundary conditions, site plan and unit information yielded a governing required fire flow (RFF) of 13,000 L/min (217 L/s). This RFF value corresponded to the governing back-to-back townhouse block fire area comprising four 3-storey units. This value was used to obtain boundary conditions for this assessment.

Since then, further architectural modifications to the site plan have been identified by Caivan which subsequently result in a reduced required fire flow for the development area. It is understood that, for back-to-back townhouse blocks, unit sizes have changed (with the previous 3-storey units being replaced with 2-storey products), and that firewalls will be added to back-to-back townhouse blocks to maintain fire areas no greater than 4 units; thus, resulting in a RFF of 9,000 L/min (150 L/s). The standard townhouse governing block results in an RFF of 12,000 L/min (200 L/s); however, under the conditions stipulated in the City of Ottawa Technical Bulletin ISDTB-2018-02, it is understood that the following condition has been met that allows the RFF to be capped at 10,000 L/min (167 L/s):

> *"For traditional side-by-side town and row houses, provided that:*
>
> *a. Firewalls with a minimum two hour fire-resistance rating that comply with OBC Div. B, Subsection 3.1.10, are constructed to separate a town or row house block into fire areas of no more than the lesser of 7 dwellings, or 600 m² in building area (building footprint); and,*
>
> *b. There is a minimum separation of 10 m between the backs of adjacent units (the cap is not applicable to back-to-back townhouses)."*

The local watermains must therefore be able to provide a minimum fire flow of 10,000 L/min (167 L/s) at a residual pressure of 20 psi. The FUS fire flow calculation for the governing unit design is provided in **Appendix B**.

2.2 GROWTH AND DEMAND PROJECTIONS

The estimated residential population for the development area was estimated based on projected household sizes as per population densities (or persons per unit, PPU) specified in the City's Water Design Guidelines.

Table 2-1 shows the estimated number of units in these development lands and the projected population based on the distribution of residential unit types. The total number of units is estimated to be 123 with a residential population of 332 persons.

Table 2-1: Estimated Unit Counts and Populations

Unit Type	Unit Count	PPU	Population
MLT	123	2.7	332

2.3 DEMAND PROJECTIONS

Due to the size of the service area, the criteria outlined in the City's 2013 Water Distribution Guidelines and the MECP Design Guidelines for Drinking Water Systems (specifically Table 3-3) were followed to establish water demands for the development area.

Subsequently, the average day (AVDY) consumption rate of 280 L/cap/d was applied to align with revised water rates identified by the City's Technical Bulletin ISTB-2021-03. A maximum day (MXDY) peaking factor of 3.6 was then applied to the AVDY demand to provide a MXDY demand, and a peak hour (PKHR) peaking factor of 5.4 was then applied to the AVDY demand to provide a PKHR demand.

Estimated AVDY, MXDY and PKHR demand projections are summarize in **Table 2-2**.

Table 2-2: Estimated Demand Projections

Unit Types	AVDY (L/s)	MXDY (L/s)	PKHR (L/s)
MLT	1.08	3.87	5.81

2.4 MODEL DEVELOPMENT

Innovyze's InfoWater Pro (Suite 3.5, Update #3) was used to create a stand-alone hydraulic model of the water distribution system within the proposed development area for this analysis. The model was developed to reflect the most current site plan, including proposed watermain layout (based on proposed road alignment), grading plan and water demands.

Watermains added to the model were assigned Hazen-Williams coefficients ("C-Factors") in accordance with the City's Water Design Guidelines. These factors are listed in **Table 2-3**.

Table 2-3: Hazen-Williams Coefficients by Watermain Size

Watermain Diameter (mm)	Coefficient
150	100
200 - 250	110
300 - 600	120
> 600	130

2.4.1 Boundary Conditions

The proposed subdivision has three connection points to the existing water distribution system (see **Section 1.1**). The boundary conditions include hydraulic gradeline (HGL) values; these values are

provided in **Appendix C** and summarized in **Table 2-4**, and have been simulated in the hydraulic model using fixed head reservoirs to which HGLs have been applied for the respective demand scenarios.

Table 2-4: HGL Boundary Conditions

Demand Scenario	HGL (m)		
	Connection 1 (1)	Connection 2 (2)	Connection 3 (3)
AVDY	130.2	130.2	130.3
PKHR	126.1	126.2	126.4
MXDY+FF (4)	115.1	120.2	126.5
AVDY+FF (4) (5)	116.7	121.8	128.0

Notes:

(1) Ground elevation @ Connection 1 (Aquarium Ave) = 87.3 m.
(2) Ground elevation @ Connection 2 (Sculpin St) = 87.3 m.
(3) Ground elevation @ Connection 3 (Mer Bleue Rd) = 87.7 m.
(4) For FF = 13,000 L/min.
(5) Used for reliability scenarios.

2.4.2 Proposed Watermain Sizing & Layout

Based on current provided boundary condition HGLs, modelling indicates that 200 mm diameter watermains throughout the proposed subdivision, with three connections to the existing system (as per **Section 1.1** and as shown in **Figure 2-2**), are capable of supplying the AVDY, PKHR and MXDY+FF demands while satisfying system pressure requirements.

As part of the currently proposed watermain layout, a single loop in the northern portion of the development is proposed to service 51 townhouse units. This equates to an AVDY demand of 0.45 L/s, or 38.9 m^3/d (i.e., less than 50 m^3/d). As per ISTB-2021-03, updated Section 4.3.1 of the Ottawa Water Distribution Systems Design Guidelines now states that "Industrial, commercial, institutional service areas with a basic day demand greater than 50 m^3/d and *residential areas serving 50 or more dwellings shall be connected with a minimum of two watermains*, separated by an isolation valve, to avoid the creation of a vulnerable service area." It is proposed that two of these dwellings may be serviced by a line separate from this loop (e.g., separate service line connected to the watermain from Aquarium Ave to service the two units immediately north of the City easement) to avoid the creation of a vulnerable service area.

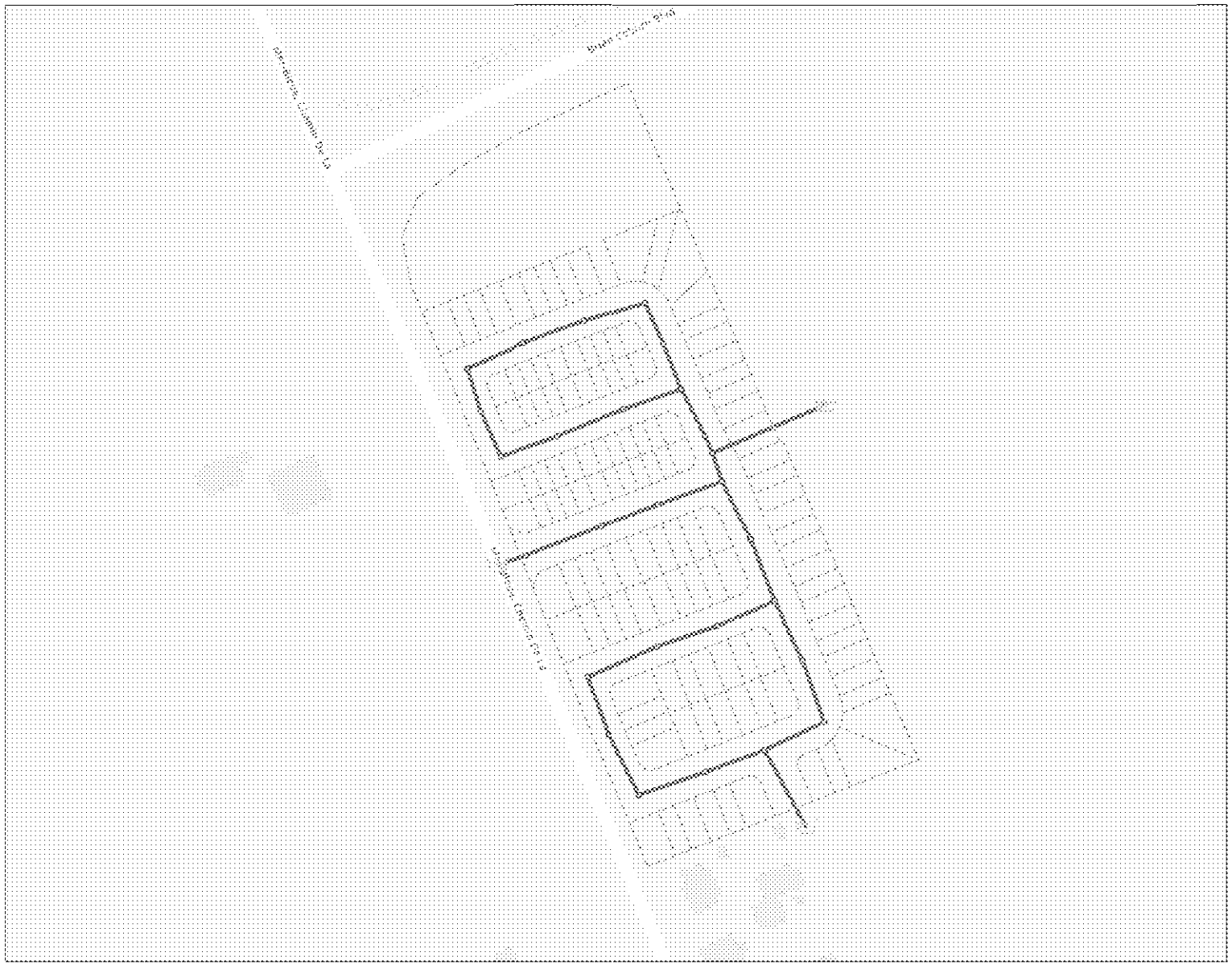


Figure No.
2-2

Title
Proposed Watermain Sizing & Layout

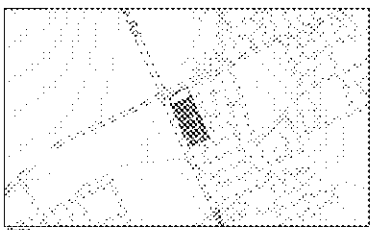
Client/Project
Caivan Communities
2275 Mer Bleue

Project Location
2275 Mer Bleue, Ottawa, Ontario, Canada

N

0 25 50 Meters
(At original document size of 11x17)
1:1,750

Legend
200 mm watermain



Notes
1. Coordinate System: NAD 1983 MTM 9
2. Background: Esri, Maxar, Geoeye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Stantec

000117

2.5 HYDRAULIC MODELLING RESULTS

Hydraulic modelling was completed to verify how the network would respond. The following sub-sections present the modelling results under AVDY, PKHR, and MXDY+FF demands, and also under emergency conditions under AVDY+FF conditions in the event of a watermain break at key points within the preliminary network layout as shown in **Figure 2-2**.

All junction IDs are shown in **Appendix D**, with detailed modelling results for all scenarios provided in **Appendix E**.

2.5.1 Average Day & Peak Hour Demands

Under AVDY demands with existing servicing boundary conditions, maximum modelled pressures for the buildout conditions are 59 to 60 psi which is within the City's desired pressure range of 50 to 80 psi.

Under PKHR demands with existing servicing boundary conditions, modelling shows that minimum pressures range between 53 psi and 54 psi which falls within the desired pressure range of 50 to 80 psi.

2.5.2 Maximum Day Plus Fire Flow

In this demand scenario, all fire flows must meet or exceed the RFF of 10,000 L/min (167 L/s) as described in **Section 2.1.2**. Under MXDY+FF demands, modelling shows that the RFF is exceeded across all nodes.

2.6 RELIABILITY

As per the City of Ottawa Design Guidelines, the system must be able to provide average day demand plus fire flow while meeting serviceability requirements during a major failure (i.e., watermain break). To confirm reliability and resiliency against major failures, a number of reliability scenarios were reviewed to confirm sufficient pressure and flow can be achieved during a major failure. For these scenarios, modelling has been completed under AVDY+FF demands. These scenarios included the following and are shown on **Figure 2-3**:

1) **Break Scenario 1 –** Break in the 200 mm watermain connection from Aquarium Ave (Connection 1);

2) **Break Scenario 2 –** Break in the 200 mm watermain connection from Sculpin St (Connection 2); and,

3) **Break Scenario 3 –** Break in the 200 mm watermain connecting to the 400 mm watermain from Mer Bleue Rd (Connection 3).

Under break scenario 1, model results show that the RFF of 10,000 L/min is exceeded across all nodes throughout the system and supply of AVDY+FF demand is met under this reliability scenario.

Under break scenario 2, model results show that the RFF of 10,000 L/min is met at all junctions except for J12, J14, J16 and J18. However, given that the boundary conditions applied consider a RFF of 13,000 L/min (see **Section 2.4.1**) and that these nodes are within less than 10% of the RFF of 10,000 L/min, the local network is still considered to be able to provide a reasonable level of service under an emergency scenario. Additionally, when considering the City's optional approach to dead-end and local watermain sizing, as stipulated in Appendix I (Guidelines on Coordination of Hydrant Placement with Required Fire Flow) of the City's Technical Bulletin ISDTB-2018-02, two class AA fire hydrants within 75 m of any given building rated at 5,700 L/min (95 L/s) would satisfy the 10,000 L/min RFF. As modelled nodes are placed approximately 30 m from each other, the cumulative available fire flow for two nodes (within 75 m of any given building in this area) exceeds the 10,000 L/min RFF.

Under break scenario 3, model results show that the RFF of 10,000 L/min is met at all junctions except for J38. Modelling results indicate that this location would have an available fire flow of approximately 9,000 L/min. As with break scenario 2, given that the boundary conditions applied consider a RFF of 13,000 L/min and that this node is within 10% of the RFF of 10,000 L/min, the local network is still considered to be able to provide a reasonable level of service under an emergency scenario. Additionally, using the optional approach to dead-end and local watermain sizing, the cumulative available fire flow for two nodes (within 75 m of any given building in this area) exceeds the 10,000 L/min RFF.

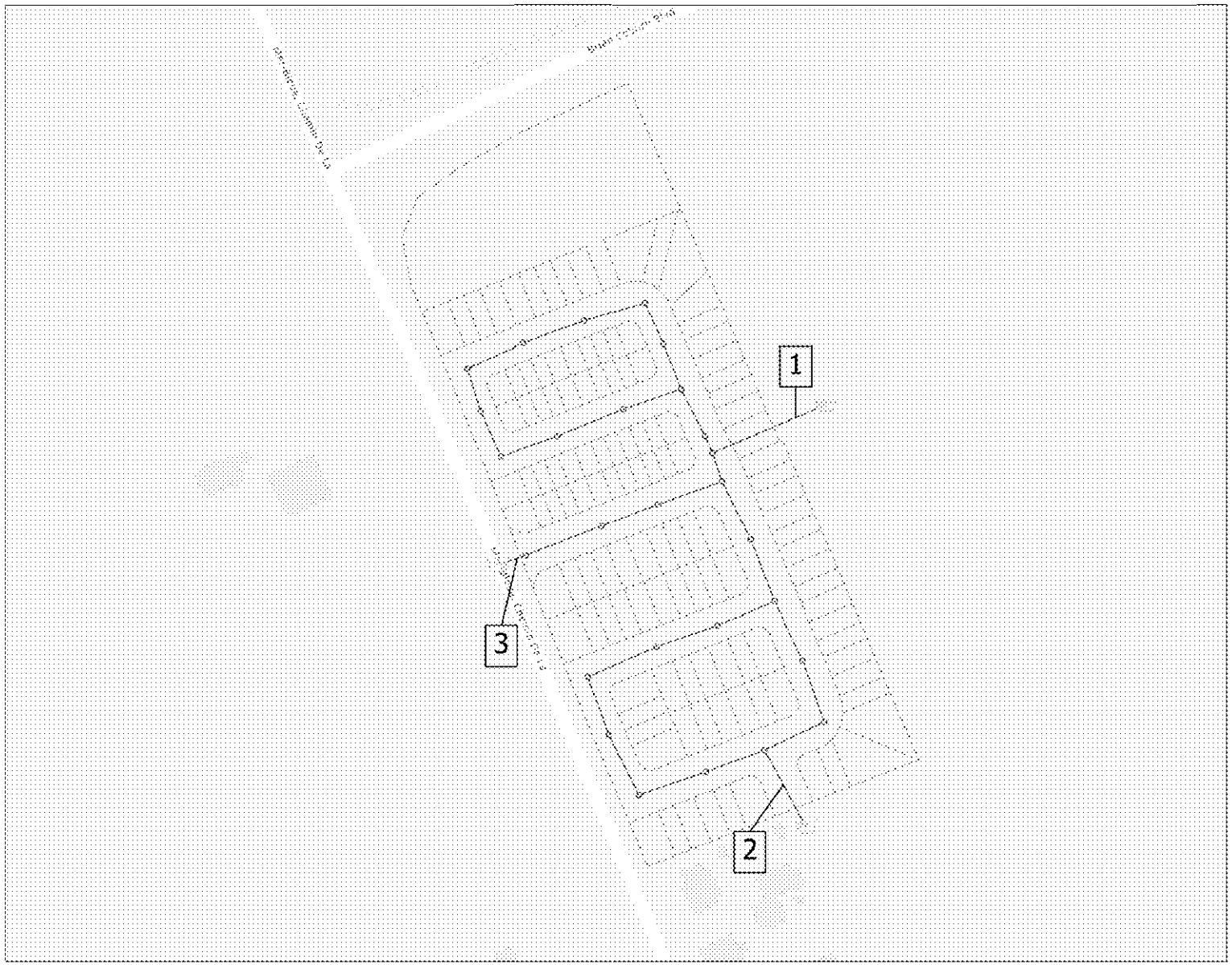


Figure No.
2-3

Title
Reliability Analysis Watermain Break Locations

Client/Project
Caivan Communities
2275 Mer Bleue

Project Location
2275 Mer Bleue, Ottawa, Ontario, Canada

N

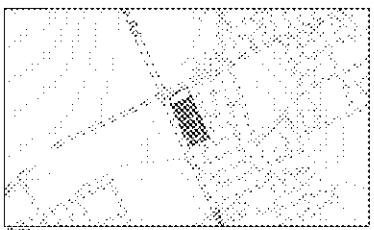
0 25 50 Meters
(At original document size of 11x17)
1:1,750

Legend

1 - Break Scenario 1

2 - Break Scenario 2

3 - Break Scenario 3



Notes
1. Coordinate System: NAD 1983 MTM 9
2. Background: Esri, Maxar, Geoeye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Stantec

3.0 CONCLUSION AND RECOMMENDATIONS

A water distribution system hydraulic analysis was completed for the proposed 2275 Mer Bleue Rd development. The purpose of this analysis was to confirm associated watermain sizing and redundancy needs. Based on the hydraulic analysis, the following conclusions and recommendations were made:

- Based on the most current site plan layout, the estimated AVDY, MXDY and PKHR demand projections for the development lands are 1.08 L/s, 3.87 L/s, and 5.81 L/s, respectively.
- By limiting the back-to-back (B2B) townhouse blocks to a maximum of 4 units, the resulting B2B RFF is 9,000 L/min. The standard (STD) townhouse blocks result in an RFF of 12,000 L/min; however, the City of Ottawa Technical Bulletin ISDTB-2018-02 allow the RFF for these STD townhouse blocks to be capped to 10,000 L/min if certain requirements are met. It is understood that these requirements have been met resulting in an RFF of 10,000 L/min for the proposed development.
- The inclusion of a third connection at Mer Bleue Rd allows for the proposed development to use 200 mm diameter watermains throughout to supply the AVDY, PKHR and MXDY+FF demands while satisfying system pressure requirements.
- Under the reliability break scenarios 2 and 3, modelling results show some junctions with available fire flows just below the RFF of 10,000 L/min. However, given that the boundary conditions applied consider a RFF of 13,000 L/min and that these nodes are within 10% of the RFF of 10,000 L/min, the local network is still considered to be able to provide a reasonable level of service under an emergency scenario. Additionally, using the optional approach to dead-end and local watermain sizing, the cumulative available fire flow for two nodes (within 75 m of any given building in this area) exceeds the 10,000 L/min RFF.

4.0 REFERENCES

City of Ottawa. (2010). *Ottawa Design Guidelines - Water Distribution*. Ottawa.

City of Ottawa. (2018). *Technical Bulletin ISTB-2018-02*. Ottawa.

City of Ottawa. (2021). *Technical Bulletin ISTB-2021-03*. Ottawa.

Stantec Consulting Ltd. (2013). *City of Ottawa 2013 Water Master Plan*. Ottawa.

Ministry of the Environment, Conservation and Parks. (2008). *Design Guidelines for Drinking Water Systems*. Ontario.

David Schaeffer Engineering (2021). Functional Service Report for 2275 Mer Bleue Road Caivan Communities. City of Ottawa

Appendix A BUILDING UNIT AREAS

Back-to-Back Townhouse (B2B)					
Model Number	**Bsmnt SQFT**	**First Flr SQFT**	**Scnd Flr SQFT**	**Total SQFT (Exc. OTB & Incl. Bsmnt)**	**Total SQFT (Excl. OTB & Bsmnt)**
B2B Interior Unit	385.27	591.88	636.44	1613.59	1228.32
B2B End Unit	393.91	609.79	684.42	1688.12	1294.21
B2B Corner Unit	428.62	615.23	651.74	1695.59	1266.97

Standard Townhouse (STD TH)					
Model Number	**Bsmnt SQFT**	**First Flr SQFT**	**Scnd Flr SQFT**	**Total SQFT (Exc. OTB & Incl. Bsmnt)**	**Total SQFT (Excl. OTB & Bsmnt)**
TH Interior Unit	454	691	869	2014.00	1560
TH End Unit	468	708	886	2062.00	1594
TTH Corner Unit	576	732	925	2233.00	1657

Appendix B FUS CALCULATION

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401721
Project Name: Mer Bleue
Date: 2022.04.04
Data inputted by: Tom Westwood, P.Eng
Data reviewed by: Jasmin Sidhu, P.Eng

Fire Flow Calculation #: 1
Building Type/Description/Name: Residential

Notes: 4-unit block of B2B townhouse units.

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	**Choose Frame Used for Construction of Unit**	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	**Choose Type of Housing (if TH, Enter Number of Units Per TH Block)**	**Floor Space Area**						
		Type of Housing	Single Family	0	Townhouse - indicate # of units	4	Units	
			Townhouse - indicate # of units	4				
			Other (Comm, Ind, Apt etc.)	0				
2.2	**# of Storeys**	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade)			2	2	Storeys	
3	**Enter Ground Floor Area of One Unit**	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction)			631	469	Area in Square Meters (m^2)	
					Square Feet (ft2)			
4	**Obtain Required Fire Flow without Reductions**	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1,000 L/min						**7,000**
5	**Apply Factors Affecting Burning**	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	**Choose Combustibility of Building Contents**	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	**5,950**
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	**Choose Reduction Due to Presence of Sprinklers**	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	**0**
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	**0**
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	**0**
			Sprinkler not fully supervised or N/A	0				
5.3	**Choose Separation Distance Between Units**	Exposure Distance Between Units	North Side	20.1 to 30.1m	0.1	0.55	m	**3,273**
			East Side	Fire Wall	0.1			
			South Side	20.1 to 30.1m	0.1			
			West Side	0 to 3.0m	0.25			
6	**Obtain Required Fire Flow, Duration & Volume**	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with maxmin limits applied:*						8,000
		Total Required Fire Flow (above) in L/s:						133
		Required Duration of Fire Flow (hrs):						1.75
		Required Volume of Fire Flow (m^3):						843

Stantec

FUS Fire Flow Calculation

Calculations based on: "*Water Supply for Public Fire Protection*" by Fire Underwriters' Survey, 1999

Stantec Project #: 163401721
Project Name: Mer Bleue
Date: 2022.04.04
Data inputted by: Tom Westwood, P.Eng
Data reviewed by: Jasmin Sidhu, P.Eng

Fire Flow Calculation #: 1
Building Type/Description/Name: Residential

Notes: 5-unit block of standard townhouse units.

Table A: Fire Underwriters Survey Determination of Required Fire Flow - Long Method

Step	Task	Term	Options	Multiplier Associated with Option	Choose:	Value Used	Unit	Total Fire Flow (L/min)
1	**Choose Frame Used for Construction of Unit**	**Framing Material**						
		Coefficient related to type of construction (C)	Wood Frame	1.5	Wood Frame	1.5	m	
			Ordinary construction	1				
			Non-combustible construction	0.8				
			Fire resistive construction (< 2 hrs)	0.7				
			Fire resistive construction (> 2 hrs)	0.6				
2	**Choose Type of Housing (if TH, Enter Number of Units Per TH Block)**	**Floor Space Area**						
		Type of Housing	Single Family	0	Townhouse - indicate # of units	5	Units	
			Townhouse - indicate # of units	5				
			Other (Comm, Ind, Apt etc.)	0				
2.2	**# of Storeys**	Number of Floors/Storeys in the Unit (do not include basement if 50% below grade)			2	2	Storeys	
3	**Enter Ground Floor Area of One Unit**	Average Floor Area (A) based total floor area of all floors (non-fire resistive construction)			799	743	Area in Square Metres (m^2)	
					Square Feet (ft2)			
4	**Obtain Required Fire Flow without Reductions**	Required Fire Flow (without reductions or increases per FUS) (F = 220 * C * √A) Round to nearest 1,000 L/min						**9,000**
5	**Apply Factors Affecting Burning**	**Reductions/Increases Due to Factors Affecting Burning**						
5.1	**Choose Combustibility of Building Contents**	Occupancy content hazard reduction or surcharge	Non-combustible	-0.25	Limited combustible	-0.15	N/A	**7,650**
			Limited combustible	-0.15				
			Combustible	0				
			Free burning	0.15				
			Rapid burning	0.25				
5.2	**Choose Reduction Due to Presence of Sprinklers**	Sprinkler reduction	Adequate Sprinkler conforms to NFPA13	-0.3	None	0	N/A	**0**
			None	0				
		Water Supply Credit	Water supply is standard for sprinkler and fire dept. hose line	-0.1	Water supply is not standard or N/A	0	N/A	**0**
			Water supply is not standard or N/A	0				
		Sprinkler Supervision Credit	Sprinkler system is fully supervised	-0.1	Sprinkler not fully supervised or N/A	0	N/A	**0**
			Sprinkler not fully supervised or N/A	0				
5.3	**Choose Separation Distance Between Units**	Exposure Distance Between Units	North Side	20.1 to 30.1m	0.1	0.55	m	**4,208**
			East Side	20.1 to 30.1m	0.1			
			South Side	10.1 to 20.0m	0.15			
			West Side	3.1 to 10.0m	0.2			
6	**Obtain Required Fire Flow, Duration & Volume**	*Total Required Fire Flow, rounded to nearest 1,000 L/min, with maxmin limits applied:*						12,000
		Total Required Fire Flow (above) in L/s:						200
		Required Duration of Fire Flow (hrs):						2.50
		Required Volume of Fire Flow (m^3):						1,800

Appendix C BOUNDARY CONDITIONS

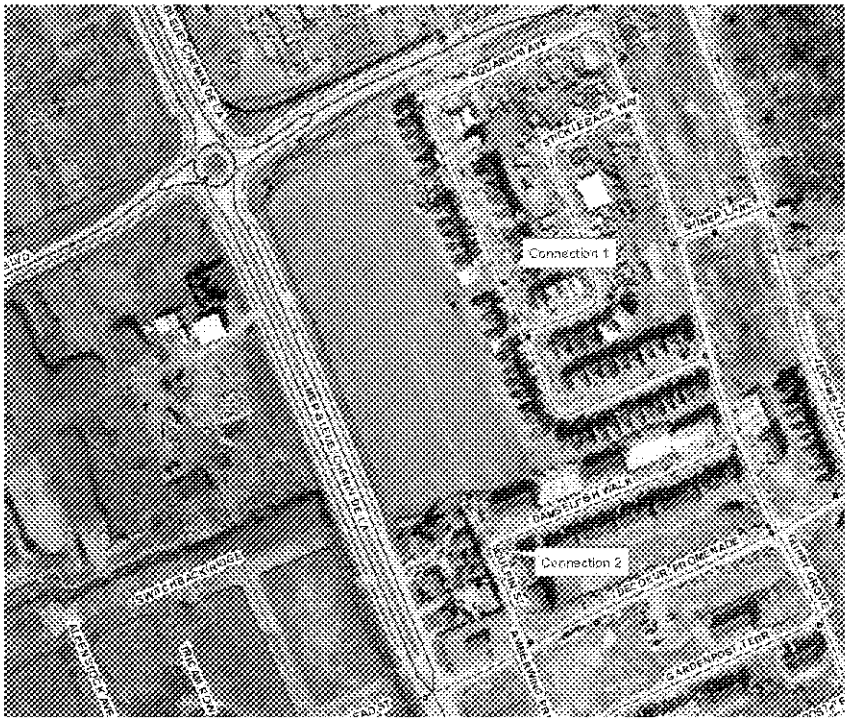
Boundary Conditions
2275 Mer Bleue Road

Provided Information

Scenario	Demand	
	L/min	L/s
Average Daily Demand	65	1.08
Maximum Daily Demand	232	3.87
Peak Hour	349	5.81
Fire Flow Demand #1	13,000	216.67

Yellow highlight denotes used boundary conditions.
Red highlight denotes boundary condition not used.

Location – Scenario 1(i) with internal looping



Results – BSDY Scenario 1(i)

Connection 1 – Aquarium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	61.0
Peak Hour	127.3	59.7
Basic Day plus Fire 1	116.2	41.7

Ground Elevation = 87.3 m

Connection 2 – Sculpin St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	61.1

Peak Hour	127.2	54.4
Basic Day plus Fire 1	121.8	49.1

Ground Elevation = 87.3 m

Results – MXDY Scenario 1(i)

Connection 1 – Aquarium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.4	81.2
Peak Hour	126.1	55.1
Max Day plus Fire 1	115.0	39.3

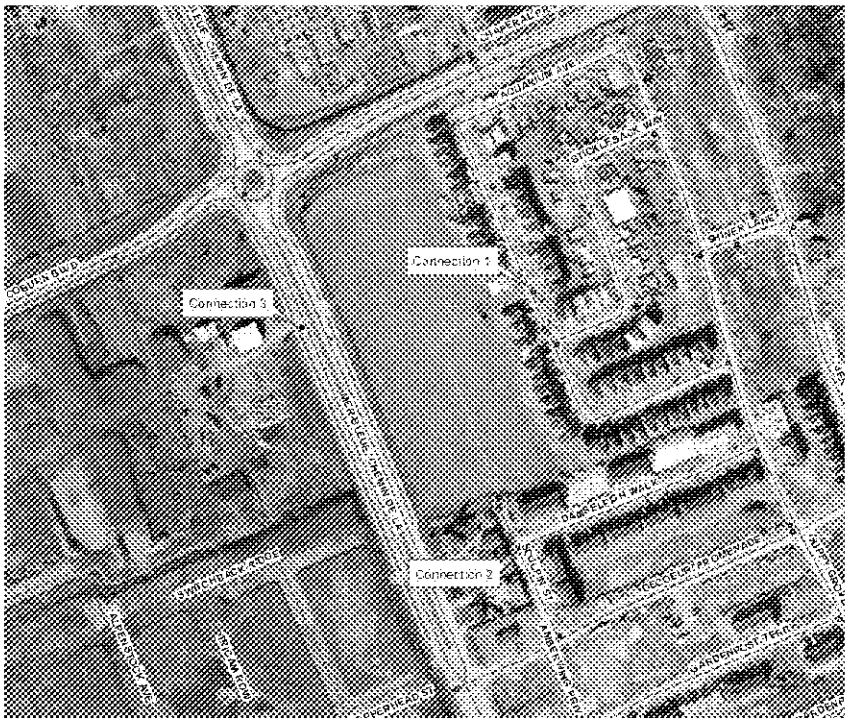
Ground Elevation = 87.3 m

Connection 2 – Sculpin St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.4	81.3
Peak Hour	126.1	55.3
Max Day plus Fire 1	120.2	40.8

Ground Elevation = 87.3 m

Location – Scenario 2 (i) with internal looping



Results – BSDY Scenario 2(i)

Connection 1 – Aquarium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	81.0
Peak Hour	127.3	56.7
Basic Day plus Fire 1	116.7	41.8

Ground Elevation = 87.3 m

Connection 2 – Sculpin St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.3	61.1
Peak Hour	127.3	56.6
Basic Day plus Fire 1	121.8	49.1

Ground Elevation = 87.3 m

Connection 3 – Mer Bleue Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.3	60.5
Peak Hour	127.3	56.2
Basic Day plus Fire 1	128.0	57.3

Ground Elevation = 87.7 m

Results – MXDY Scenario 2(i)

Connection 1 – Aquarium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.4	61.2
Peak Hour	126.1	55.2
Max Day plus Fire 1	115.1	39.5

Ground Elevation = 87.3 m

Connection 2 – Sculpin St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.4	61.3
Peak Hour	126.2	55.3
Max Day plus Fire 1	120.2	46.8

Ground Elevation = 87.3 m

Connection 3 – Mer Bleue Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.5	60.8
Peak Hour	126.4	55.0
Max Day plus Fire 1	126.5	55.1

Ground Elevation = 87.7 m

Location – Scenario 1 (ii) without internal looping

Results – BSDY Scenario 1 (ii)

Connection 1 – Aquarium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	61.0
Peak Hour	127.2	56.7
Basic Day plus Fire 1	104.7	24.7

Ground Elevation = 87.3 m

Connection 2 – Sculpin St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	61.1
Peak Hour	127.2	56.8
Basic Day plus Fire 1	113.8	41.6

Ground Elevation = 87.3 m

Results – MXDY Scenario 1(ii)

Connection 1 – Aquarium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.4	61.2
Peak Hour	126.1	55.1
Max Day plus Fire 1	102.9	22.2

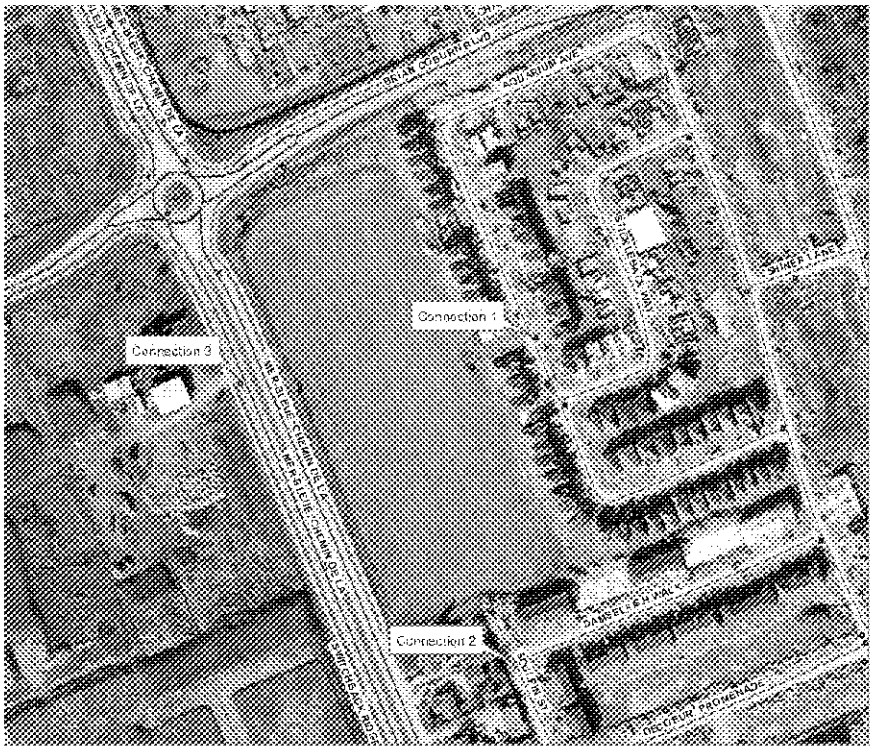
Ground Elevation = 87.3 m

Connection 2 – Sculpin St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.4	61.4
Peak Hour	126.2	56.3
Max. Day plus Fire 1	117.0	42.2

Ground Elevation = 87.3 m

Location – Scenario 2(ii) without internal looping



Results – BSDY Scenario 2(ii)

Connection 1 – Aquarium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.3	61.0
Peak Hour	127.3	56.7
Basic Day plus Fire 1	104.7	24.7

Ground Elevation = 87.3 m

Connection 2 – Sculpin St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.2	61.1
Peak Hour	127.3	56.8
Basic Day plus Fire 1	118.6	44.6

Ground Elevation = 87.3 m

Connection 3 – Mer Bleue Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.3	60.5
Peak Hour	127.3	56.2
Basic Day plus Fire 1	128.0	57.5

Ground Elevation = 87.7 m

Results – MXDY Scenario 2(ii)

Connection 1 – Aquarium Dr.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.4	61.2
Peak Hour	126.1	55.1
Max Day plus Fire 1	103.0	22.3

Ground Elevation = 87.3 m

Connection 2 – Sculpin St.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.4	61.4
Peak Hour	126.2	55.3
Max Day plus Fire 1	117.6	42.3

Ground Elevation = 87.3 m

Connection 3 – Mer Bleue Rd.

Demand Scenario	Head (m)	Pressure[1] (psi)
Maximum HGL	130.5	60.3
Peak Hour	126.4	55.0
Max Day plus Fire 1	126.5	55.1

Ground Elevation = 87.7 m

Notes

1. For modeling Scenario 1(i) and 2(i), a 200mm watermain was included for internal looping of the system between Connection locations 1 and 2.

Disclaimer

The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation. Fire Flow analysis is a reflection of available flow in the watermain; there may be additional restrictions that occur between the watermain and the hydrant that the model cannot take into account.

Appendix D JUNCTION IDS

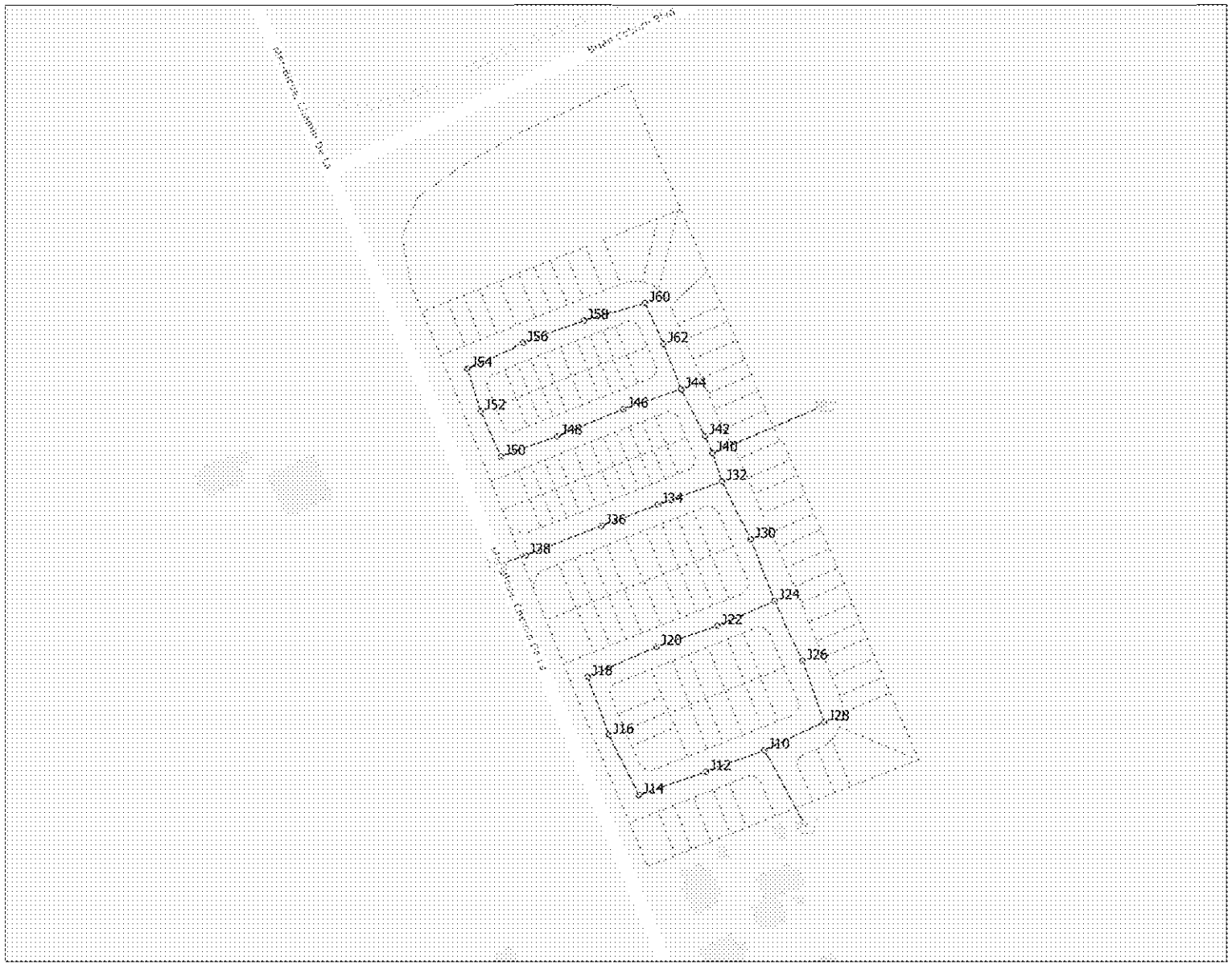


Figure No.
D-1

Title
Junction IDs

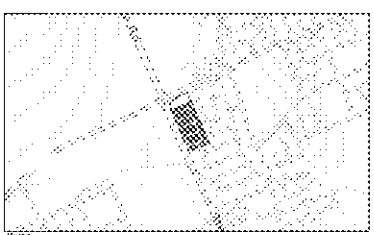
Client/Project
Caivan Communities
2275 Mer Bleue

Project Location
2275 Mer Bleue, Ottawa, Ontario, Canada

N

0 25 50 Meters
(At original document size of 11x17)
1:1,750

Legend



Notes
1. Coordinate System: NAD 1983 MTM 9
2. Background: Esri, Maxar, Geoeye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Stantec

Page 1 of 1

Appendix E MODEL RESULTS

AVDY				
ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J10	0.04	88.28	130.20	59.60
J12	0.04	88.45	130.20	59.36
J14	0.04	88.00	130.21	60.00
J16	0.04	88.26	130.21	59.63
J18	0.04	88.41	130.21	59.42
J20	0.04	88.21	130.21	59.70
J22	0.04	88.25	130.21	59.65
J24	0.04	88.30	130.21	59.58
J26	0.04	88.15	130.21	59.79
J28	0.04	88.26	130.21	59.63
J30	0.04	88.53	130.21	59.26
J32	0.04	88.57	130.22	59.21
J34	0.04	88.50	130.24	59.34
J36	0.04	88.64	130.26	59.17
J38	0.04	88.50	130.29	59.41
J40	0.04	88.47	130.21	59.34
J42	0.04	88.40	130.21	59.44
J44	0.04	88.32	130.21	59.56
J46	0.04	88.48	130.21	59.33
J48	0.04	88.63	130.21	59.11
J50	0.04	88.26	130.21	59.64
J52	0.04	88.39	130.21	59.46
J54	0.04	88.45	130.21	59.37
J56	0.04	88.61	130.21	59.14
J58	0.04	88.45	130.21	59.37
J60	0.04	88.45	130.21	59.37
J62	0.04	88.55	130.21	59.23

PKHR				
ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (psi)
J10	0.21	88.28	126.20	53.90
J12	0.21	88.45	126.20	53.66
J14	0.21	88.00	126.20	54.30
J16	0.21	88.26	126.20	53.93
J18	0.21	88.41	126.20	53.72
J20	0.21	88.21	126.20	54.00
J22	0.21	88.25	126.20	53.94
J24	0.21	88.30	126.20	53.87
J26	0.21	88.15	126.20	54.09
J28	0.21	88.26	126.20	53.93
J30	0.21	88.53	126.20	53.55
J32	0.21	88.57	126.20	53.49
J34	0.21	88.50	126.25	53.67
J36	0.21	88.64	126.30	53.54
J38	0.21	88.50	126.37	53.84
J40	0.21	88.47	126.17	53.60
J42	0.21	88.40	126.17	53.69
J44	0.21	88.32	126.17	53.81
J46	0.21	88.48	126.17	53.58
J48	0.21	88.63	126.17	53.37
J50	0.21	88.26	126.17	53.89
J52	0.21	88.39	126.17	53.71
J54	0.21	88.45	126.17	53.62
J56	0.21	88.61	126.17	53.39
J58	0.21	88.45	126.17	53.62
J60	0.21	88.45	126.17	53.62
J62	0.21	88.55	126.17	53.48

MXDY + FF							
ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	Fire-Flow Demand (L/min)	Residual Pressure (psi)	Hydrant Available Flow (L/min)	Hydrant Pressure at Available Flow (psi)
J10	0.14	45.30	120.14	10,000	39.99	>10,000	20.00
J12	0.14	45.05	120.14	10,000	36.36	>10,000	20.00
J14	0.14	45.67	120.13	10,000	34.95	>10,000	20.00
J16	0.14	45.29	120.12	10,000	33.68	>10,000	20.00
J18	0.14	45.07	120.12	10,000	33.34	>10,000	20.00
J20	0.14	45.35	120.11	10,000	34.36	>10,000	20.00
J22	0.14	45.28	120.10	10,000	35.78	>10,000	20.00
J24	0.14	45.20	120.10	10,000	38.10	>10,000	20.00
J26	0.14	45.44	120.11	10,000	37.42	>10,000	20.00
J28	0.14	45.30	120.13	10,000	37.69	>10,000	20.00
J30	0.14	44.83	120.06	10,000	37.57	>10,000	20.00
J32	0.14	44.72	120.03	10,000	38.48	>10,000	20.00
J34	0.14	47.43	121.87	10,000	39.34	>10,000	20.00
J36	0.14	49.56	123.50	10,000	40.73	>10,000	20.00
J38	0.14	52.88	125.70	10,000	48.16	>10,000	20.00
J40	0.14	43.46	119.04	10,000	37.87	>10,000	20.00
J42	0.14	43.56	119.04	10,000	36.02	>10,000	20.00
J44	0.14	43.67	119.04	10,000	30.69	>10,000	20.00
J46	0.14	43.44	119.04	10,000	26.68	>10,000	20.00
J48	0.14	43.23	119.04	10,000	23.96	>10,000	20.00
J50	0.14	43.76	119.04	10,000	23.26	>10,000	20.00
J52	0.14	43.57	119.04	10,000	22.54	>10,000	20.00
J54	0.14	43.49	119.04	10,000	22.32	>10,000	20.00
J56	0.14	43.26	119.04	10,000	22.40	>10,000	20.00
J58	0.14	43.49	119.04	10,000	23.62	>10,000	20.00
J60	0.14	43.49	119.04	10,000	25.41	>10,000	20.00
J62	0.14	43.34	119.04	10,000	27.14	>10,000	20.00

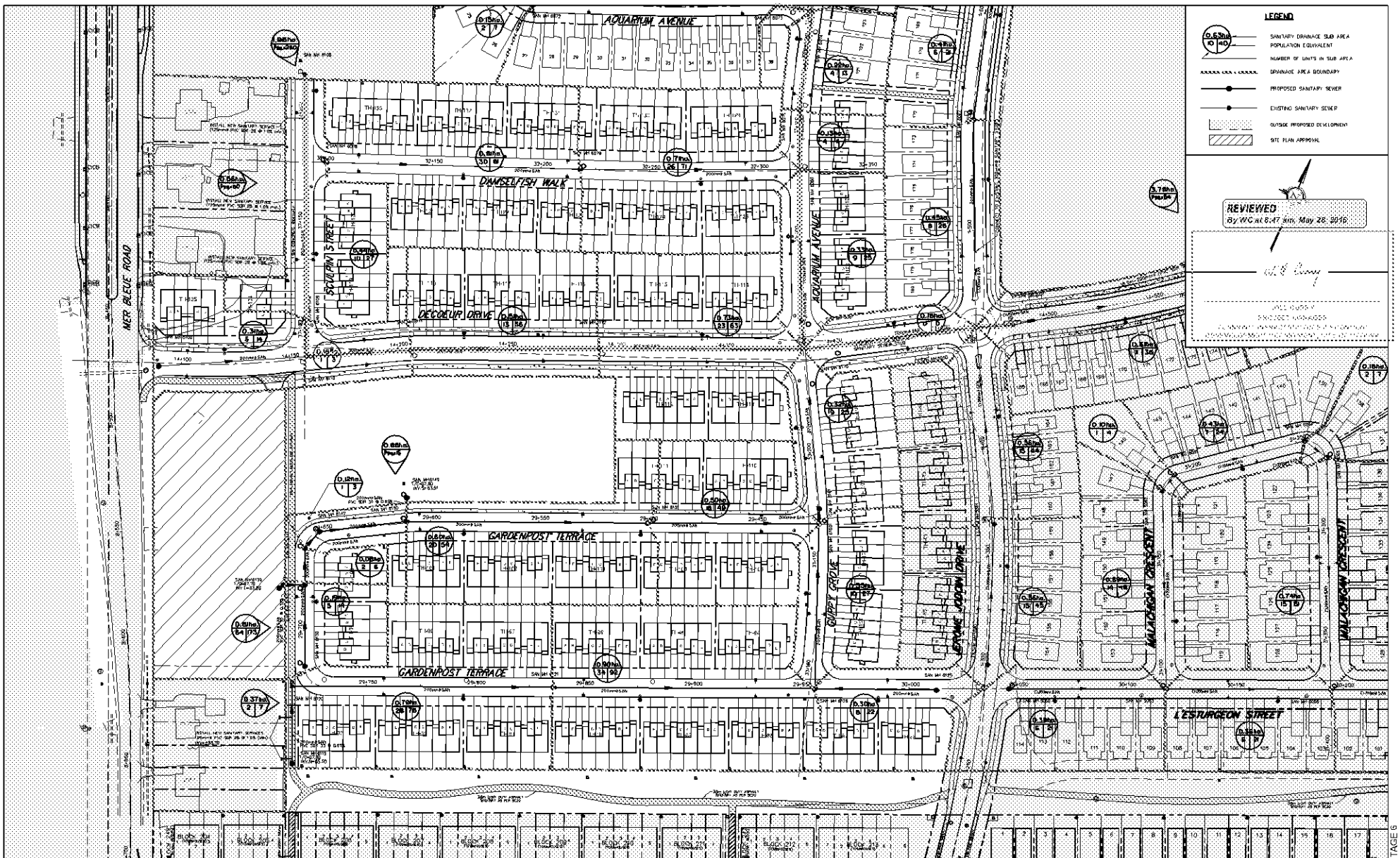
AVDY+FF (Break Scenario 1: Aquarium Ave Break)							
ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	Fire-Flow Demand (L/min)	Residual Pressure (psi)	Hydrant Available Flow (L/min)	Hydrant Pressure at Available Flow (psi)
J10	0.04	49.06	122.79	10,000	44.89	>10,000	20.00
J12	0.04	48.99	122.91	10,000	41.49	>10,000	20.00
J14	0.04	49.82	123.05	10,000	40.08	>10,000	20.00
J16	0.04	49.64	123.18	10,000	38.81	>10,000	20.00
J18	0.04	49.60	123.30	10,000	38.57	>10,000	20.00
J20	0.04	50.10	123.45	10,000	39.73	>10,000	20.00
J22	0.04	50.22	123.58	10,000	41.27	>10,000	20.00
J24	0.04	50.32	123.70	10,000	43.71	>10,000	20.00
J26	0.04	50.10	123.39	10,000	42.79	>10,000	20.00
J28	0.04	49.52	123.09	10,000	42.83	>10,000	20.00
J30	0.04	51.07	124.45	10,000	43.23	>10,000	20.00
J32	0.04	52.07	125.20	10,000	43.66	>10,000	20.00
J34	0.04	53.30	126.00	10,000	45.01	>10,000	20.00
J36	0.04	54.11	126.70	10,000	46.53	>10,000	20.00
J38	0.04	55.66	127.65	10,000	51.50	>10,000	20.00
J40	0.04	52.21	125.20	10,000	40.70	>10,000	20.00
J42	0.04	52.31	125.20	10,000	38.88	>10,000	20.00
J44	0.04	52.43	125.20	10,000	33.61	>10,000	20.00
J46	0.04	52.20	125.20	10,000	29.62	>10,000	20.00
J48	0.04	51.99	125.20	10,000	26.91	>10,000	20.00
J50	0.04	52.51	125.20	10,000	26.22	>10,000	20.00
J52	0.04	52.33	125.20	10,000	25.51	>10,000	20.00
J54	0.04	52.24	125.20	10,000	25.28	>10,000	20.00
J56	0.04	52.01	125.20	10,000	25.36	>10,000	20.00
J58	0.04	52.24	125.20	10,000	26.58	>10,000	20.00
J60	0.04	52.24	125.20	10,000	28.35	>10,000	20.00
J62	0.04	52.10	125.20	10,000	30.07	>10,000	20.00

AVDY+FF (Break Scenario 2: Sculpin St Break)							
ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	Fire-Flow Demand (L/min)	Residual Pressure (psi)	Hydrant Available Flow (L/min)	Hydrant Pressure at Available Flow (psi)
J10	0.04	46.61	121.06	10,000	17.98	10,000	20.00
J12	0.04	46.36	121.06	10,000	16.86	9,300	20.00
J14	0.04	47.00	121.06	10,000	17.17	9,400	20.00
J16	0.04	46.63	121.06	10,000	17.10	9,400	20.00
J18	0.04	46.42	121.06	10,000	17.72	9,500	20.00
J20	0.04	46.70	121.06	10,000	19.84	10,000	20.00
J22	0.04	46.65	121.06	10,000	22.28	>10,000	20.00
J24	0.04	46.58	121.06	10,000	26.17	>10,000	20.00
J26	0.04	46.79	121.06	10,000	22.20	>10,000	20.00
J28	0.04	46.63	121.06	10,000	19.62	10,000	20.00
J30	0.04	46.25	121.06	10,000	32.63	>10,000	20.00
J32	0.04	46.19	121.06	10,000	39.25	>10,000	20.00
J34	0.04	49.10	123.04	10,000	40.00	>10,000	20.00
J36	0.04	51.39	124.79	10,000	40.88	>10,000	20.00
J38	0.04	54.93	127.14	10,000	49.82	>10,000	20.00
J40	0.04	45.11	120.20	10,000	39.24	>10,000	20.00
J42	0.04	45.21	120.20	10,000	37.42	>10,000	20.00
J44	0.04	45.32	120.20	10,000	32.15	>10,000	20.00
J46	0.04	45.09	120.20	10,000	28.16	>10,000	20.00
J48	0.04	44.88	120.20	10,000	25.46	>10,000	20.00
J50	0.04	45.41	120.20	10,000	24.77	>10,000	20.00
J52	0.04	45.22	120.20	10,000	24.05	>10,000	20.00
J54	0.04	45.14	120.20	10,000	23.82	>10,000	20.00
J56	0.04	44.91	120.20	10,000	23.91	>10,000	20.00
J58	0.04	45.14	120.20	10,000	25.12	>10,000	20.00
J60	0.04	45.14	120.20	10,000	26.90	>10,000	20.00
J62	0.04	45.00	120.20	10,000	28.62	>10,000	20.00

AVDY+FF (Break Scenario 3: Mer Bleue Rd Break)							
ID	Static Demand (L/s)	Static Pressure (psi)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (psi)	Hydrant Available Flow (L/s)	Hydrant Pressure at Available Flow (psi)
J10	0.04	46.23	120.80	10,000	40.01	>10,000	20.00
J12	0.04	45.81	120.68	10,000	36.42	>10,000	20.00
J14	0.04	46.25	120.54	10,000	35.09	>10,000	20.00
J16	0.04	45.69	120.40	10,000	33.82	>10,000	20.00
J18	0.04	45.31	120.28	10,000	33.46	>10,000	20.00
J20	0.04	45.38	120.13	10,000	34.41	>10,000	20.00
J22	0.04	45.15	120.01	10,000	35.72	>10,000	20.00
J24	0.04	44.91	119.89	10,000	37.87	>10,000	20.00
J26	0.04	45.56	120.20	10,000	37.44	>10,000	20.00
J28	0.04	45.82	120.49	10,000	37.82	>10,000	20.00
J30	0.04	43.52	119.14	10,000	36.69	>10,000	20.00
J32	0.04	42.42	118.41	10,000	36.58	>10,000	20.00
J34	0.04	42.52	118.41	10,000	29.66	>10,000	20.00
J36	0.04	42.32	118.41	10,000	23.24	>10,000	20.00
J38	0.04	42.52	118.41	10,000	15.10	9,000	20.00
J40	0.04	42.08	118.07	10,000	36.96	>10,000	20.00
J42	0.04	42.18	118.07	10,000	35.14	>10,000	20.00
J44	0.04	42.29	118.07	10,000	29.87	>10,000	20.00
J46	0.04	42.06	118.07	10,000	25.88	>10,000	20.00
J48	0.04	41.85	118.07	10,000	23.18	>10,000	20.00
J50	0.04	42.38	118.07	10,000	22.49	>10,000	20.00
J52	0.04	42.19	118.07	10,000	21.77	>10,000	20.00
J54	0.04	42.11	118.07	10,000	21.54	>10,000	20.00
J56	0.04	41.88	118.07	10,000	21.62	>10,000	20.00
J58	0.04	42.11	118.07	10,000	22.84	>10,000	20.00
J60	0.04	42.11	118.07	10,000	24.62	>10,000	20.00
J62	0.04	41.96	118.07	10,000	26.34	>10,000	20.00

APPENDIX D

Wastewater Collection



THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
1	AS PER CITY COMMENTS	MAR. 18/16	AGS
2	ISSUED FOR TENDER	MAR. 28/16	AGS
3	AS PER CITY COMMENTS	APR. 26/16	AGS
4	ISSUED FOR CONSTRUCTION	MAY 7/16	AGS
5	AS PER CITY COMMENTS	MAY 17/16	AGS

SCALE 1:750 0m 12 24m

DESIGN PLM
CHECKED AGS
DRAWN PNC
CHECKED PLM
APPROVED AGS

LICENSED PROFESSIONAL ENGINEER s.21 PROVINCE OF ONTARIO

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

CLIENT No. 148
PROJECT No. 170401

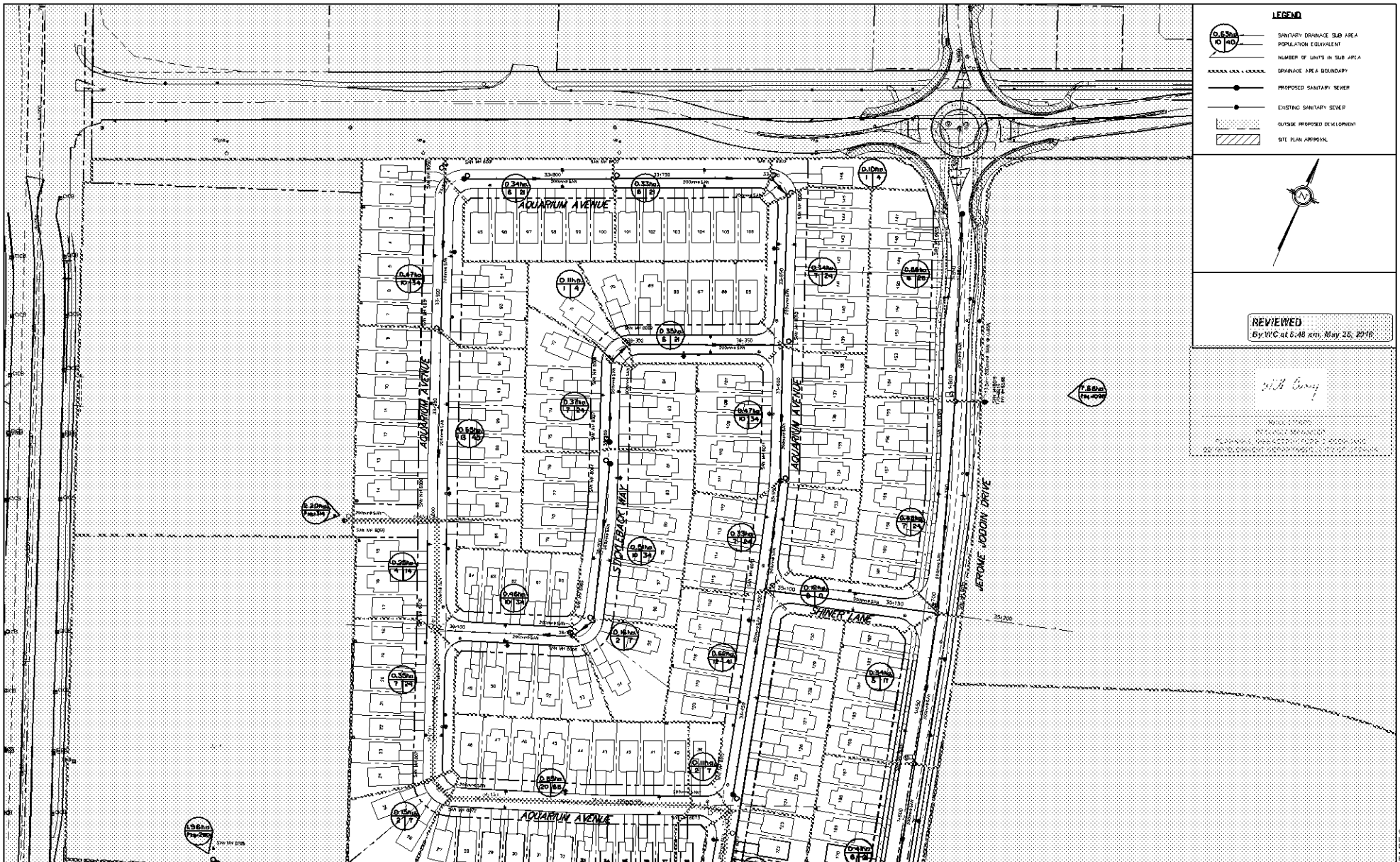
PLAN
SANITARY DRAINAGE AREA PLAN

DRAWING No. 170401-SANI

D07-16-09-0018-STAGE 6

15796

000143



THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
1	AS PER CITY COMMENTS	MAR 16/18	AGS
2	ISSUED FOR TENDER	MAR. 28/18	AGS
3	AS PER CITY COMMENTS	APR. 26/18	AGS
4	ISSUED FOR CONSTRUCTION	MAY 7/18	AGS
5	AS PER CITY COMMENTS	MAY 17/18	AGS

SCALE 1:750 0m 0 24m

DESIGN	PLM
CHECKED	AGS
DRAWN	PNC
CHECKED	PLM
APPROVED	AGS

LICENCED PROFESSIONAL ENGINEER s.21 PROVINCE OF ONTARIO

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

CLIENT No. 148
PROJECT No. 170401
DRAWING No. 170401-SAN2

PLAN
SANITARY DRAINAGE AREA PLAN

D07-16-09-0018-STAGE 6

16796

000144

SANITARY SEWER COMPUTATION FORM

Table 22

DATE: March, 2018
DESIGNED BY: PLM
CHECKED BY: AGS

PROJECT: Neighbourhood 5 - Avalon Encore - Stage 6
CLIENT: Minto Communities Inc.
PROJECT #: 170401
BY: ATREL ENGINEERING LTD

q= 350 l/cap.day
i= 0.28 l/ha.s
PVC/CONC N= 0.013
OTHER N= 0.024

Townhouse= 2.7 person/unit
Back to Back= 2.7 person/unit
Single Dwellings= 3.4 person/unit

STREET NAMES	LOCATION FROM (Up)		TO (Down)		RESIDENTIAL INDIVIDUAL AREA (ha.)	INDIVIDUAL POP.	CUMULATIVE AREA (ha.)	CUMULATIVE POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	COMMERCIAL, INSTITUTIONAL INDIVIDUAL AREA (ha.)	INDIVIDUAL POP.	CUMULATIVE AREA (ha.)	CUMULATIVE POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	PEAK EXT. FLOW Q(i) (L/S)	PEAK DES. Q(dd) (L/S)	SEWER DATA TYPE PIPE	DIA. (NOM) (mm)	DIA. (ACT) (MM)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/s)	Upstream Obv. (M)	Upstream Inv. (M)	Downstream Obv. (M)	Downstream Inv. (M)	HGL at UP-MH (M)	HGL Old UP-MH (M)	HGL at Down MH (M)	USF ELEV. (M)	FREEBOARD HGL (M)	FREEBOARD REQUIREMENT SATISFIED
Aquarium Avenue	MH	5001	MH	6002	0.33	33.0	0.34	20	4.00	0.34							0.10	0.44	PVC	200	201.2	0.55	88.5	26.86	99%	0.84	86.77	86.57	86.37	86.12	86.49	86.48	86.48	86.47	0.70	YES
Aquarium Avenue	MH	6002	MH	6003	0.33	33.0	0.67	42	4.00	0.68							0.19	0.87	PVC	200	201.2	0.55	77.0	18.93	95%	0.60	86.32	86.12	86.09	84.89	86.48	86.48	86.48	86.40	0.92	YES
Aquarium Avenue	MH	6003	MH	6004	0.33	33.0	1.17	46	4.00	0.75							0.22	0.96	PVC	200	201.2	0.55	77.0	18.93	95%	0.60	86.06	84.86	85.92	84.82	86.49	86.48	86.48	86.48	1.00	YES
Aquarium Avenue	MH	6004	MH	6010	0.33	33.0	1.10	70	4.00	1.13							0.31	1.44	PVC	200	201.2	0.55	88.0	18.93	92%	0.60	84.66	84.46	84.44	84.24	86.49	86.48	86.48	86.22	0.74	YES
Stickleback Way	MH	6007	MH	6008	0.33	33.0	0.34	24	4.00	0.34							0.10	0.48	PVC	200	201.2	0.55	37.0	26.86	98%	0.84	85.74	85.54	85.50	85.30	85.50	85.50	85.50	86.35	0.61	YES
Stickleback Way	MH	6008	MH	6009	0.33	33.0	0.45	28	4.00	0.45							0.13	0.58	PVC	200	201.2	0.55	77.0	18.93	97%	0.60	85.47	85.27	85.44	85.24	85.48	85.48	85.48	85.57	1.06	YES
Stickleback Way	MH	6009	MH	6010	0.33	33.0	0.80	49	4.00	0.79							0.22	1.02	PVC	200	201.2	0.55	77.0	18.93	95%	0.60	85.27	85.07	85.04	84.84	86.49	86.48	86.48	86.40	0.92	YES
Aquarium Avenue	MH	6010	MH	6011	0.67	33.0	2.37	153	4.00	2.49							0.66	3.14	PVC	200	201.2	0.55	93.5	18.93	83%	0.60	84.44	84.24	84.24	84.04	86.48	86.48	85.47	86.09	0.61	YES
Aquarium Avenue	MH	6011	MH	6013	0.33	33.0	2.70	177	4.00	2.87							0.76	3.62	PVC	200	201.2	0.55	91.0	18.93	81%	0.60	84.21	84.01	84.05	83.85	86.47	85.47	85.46	86.05	0.58	YES
Aquarium Avenue	MH	6012	MH	6013	0.52	31.5	0.52	41	4.00	0.66							0.17	0.84	PVC	200	201.2	0.55	34.5	26.86	97%	0.84	84.73	84.53	84.12	83.92	85.46	85.46	85.46	86.13	0.67	YES
Shiner Lane	MH	6013	MH	6025	0.12		3.44	218	4.00	3.93							0.96	4.50	PVC	200	201.2	1.30	75.0	33.31	87%	1.05	83.71	83.51	82.92	82.72	85.46	85.46	85.45	n/a	n/a	n/a
Jerome Jodoin	MH	6015	MH	6020	0.56	28.0	0.56	28	4.00	0.45							0.16	0.61	PVC	200	201.2	0.55	20.0	36.49	98%	1.15	86.36	86.16	84.33	84.13	86.55	86.55	86.55	86.27	0.72	YES
School	MH	6019	MH	6020							2.55	1058.0	7.60	1098	1.50	6.67	2.15	8.82	PVC	200	201.2	0.55	13.5	26.86	67%	0.84	83.68	83.68	83.59	83.59	86.56	86.56	86.55	n/a	n/a	n/a
Jerome Jodoin	MH	6020	MH	6025	0.33	33.0	1.04	52	4.00	0.94			7.60	1098	1.50	6.67	2.44	9.95	PVC	200	201.2	0.55	92.5	18.93	47%	0.60	83.73	83.53	83.42	83.22	86.55	86.54	86.45	86.17	0.83	YES
Jerome Jodoin	MH	6025	MH	6026	0.33	33.0	4.82	287	4.00	4.65			7.60	1098	1.50	6.67	3.50	14.82	PVC	300	299.2	0.30	82.5	42.94	65%	0.61	82.92	82.62	82.78	82.48	86.45	85.45	85.43	86.15	0.70	YES
Jerome Jodoin	MH	6025	MH	6027	0.33	33.0	5.23	308	4.00	4.99			7.60	1098	1.50	6.67	3.61	15.28	PVC	300	299.2	0.30	82.5	42.94	64%	0.61	82.78	82.48	82.63	82.33	86.43	85.43	85.41	86.04	0.61	YES
Jerome Jodoin	MH	6027	MH	6050	0.33	33.0	5.66	335	4.00	5.44			7.60	1098	1.50	6.67	3.74	15.86	PVC	300	299.2	0.30	82.5	42.94	63%	0.61	82.63	82.33	82.44	82.14	86.41	85.41	85.38	85.95	0.54	YES
Aquarium Avenue	MH	6050	MH	6051	0.33	33.0	0.47	34	4.00	0.55							0.13	0.68	PVC	200	201.2	0.55	88.5	26.86	97%	0.84	85.62	85.42	85.12	84.92	86.72	85.72	85.72	86.54	0.82	YES
Aquarium Avenue	MH	6051	MH	6060	0.65	35.0	1.12	79	4.00	1.29							0.31	1.59	PVC	200	201.2	0.55	88.5	10.93	92%	0.60	85.12	84.92	84.64	84.64	86.72	85.72	85.72	86.45	0.73	YES
Commercial	MH	6059	MH	6060							2.20	393.0	2.20	314	1.50	1.91	0.62	2.52	PVC	200	201.2	0.55	32.0	18.93	87%	0.60	84.44	84.24	84.30	84.10	86.72	85.72	85.72	n/a	n/a	n/a
Aquarium Avenue	MH	6060	MH	6070	0.35	35.0	1.37	93	4.00	1.51			2.20	314	1.50	1.91	1.00	4.41	PVC	200	201.2	0.55	35.0	18.93	77%	0.60	84.24	84.04	84.08	83.88	86.72	85.72	85.71	86.40	0.68	YES
Stickleback Way	MH	6064	MH	6065	0.33	33.0	0.51	34	4.00	0.55							0.14	0.69	PVC	200	201.2	0.55	88.0	26.86	97%	0.84	85.47	85.27	85.00	84.80	86.71	85.71	85.71	86.37	0.66	YES
Stickleback Way	MH	6065	MH	6066	0.15	7.5	0.67	41	4.00	0.66							0.19	0.85	PVC	200	201.2	0.55	77.5	18.93	95%	0.60	84.97	84.77	84.93	84.73	86.71	85.71	85.71	86.34	0.63	YES
Stickleback Way	MH	6066	MH	6070	0.33	33.0	1.13	75	4.00	1.22							0.32	1.53	PVC	200	201.2	0.55	88.0	18.93	92%	0.60	84.90	84.70	84.70	84.50	86.71	85.71	85.71	86.31	0.60	YES
Aquarium Avenue	MH	6070	MH	6071	0.33	33.0	2.85	192	4.00	3.11			2.20	314	1.50	1.91	1.41	6.43	PVC	200	201.2	0.55	88.5	18.93	66%	0.60	84.08	83.88	83.96	83.66	86.71	85.71	85.68	86.44	0.73	YES
Aquarium Avenue	MH	6071	MH	6072	0.15	7.5	3.00	199	4.00	3.22			2.20	314	1.50	1.91	1.46	6.59	PVC	200	201.2	0.55	93.5	18.93	65%	0.60	83.83	83.63	83.79	83.59	85.68	85.68	85.66	86.25	0.57	YES
Aquarium Avenue	MH	6072	MH	6073	0.35	35.0	3.05	267	4.00	4.33			2.20	314	1.50	1.91	1.69	7.93	PVC	200	201.2	0.55	111.0	18.93	58%	0.60	83.76	83.56	83.40	83.20	85.68	85.68	85.62	86.06	0.38	YES
Aquarium Avenue	MH	6073	MH	6074	0.11	7.5	3.96	274	4.00	4.44			2.20	314	1.50	1.91	1.72	8.07	PVC	200	201.2	0.55	93.5	18.93	57%	0.60	83.40	83.20	83.34	82.14	85.62	85.62	85.61	86.21	0.59	YES
Aquarium Avenue	MH	6074	MH	6075	0.33	33.0	4.18	287	4.00	4.65			2.20	314	1.50	1.91	1.79	8.34	PVC	200	201.2	0.55	45.5	18.93	56%	0.60	83.29	83.08	82.13	82.93	85.61	85.61	85.58	86.02	0.41	YES
Aquarium Avenue	MH	6075	MH	6080	0.33	33.0	4.31	296	4.00	4.83			2.20	314	1.50	1.91	1.82	8.56	PVC	200	201.2	0.55	91.5	18.93	55%	0.60	82.93	82.04	82.84	82.64	85.58	85.58	85.56	86.02	0.44	YES
Damselfish Walk	MH	6078	MH	6079	0.33	33.0	0.61	80	4.00	1.30							0.23	1.34	PVC	200	201.2	0.55	207.0	26.86	95%	0.84	84.64	84.44	83.99	83.69	85.57	85.57	85.57	86.09	0.52	YES
Damselfish Walk	MH	6079	MH	6080	0.71	71.0	1.52	152	4.00	2.46							0.43	2.89	PVC	200	201.2	0.55	201.0	18.93	85%	0.60	83.88	83.68	83.55	83.35	85.57	85.57	85.56	85.98	0.41	YES
Aquarium Avenue	MH	6080	MH	6081	0.33	33.0	6.16	475	3.99	7.67			2.20	314	1.50	1.91	2.34	11.92	PVC	200	201.2	0.55	89.5	18.93	37%	0.60	83.04	82.84	82.37	82.67	85.56	85.56	85.47	85.98	0.42	YES
Aquarium Avenue	MH	6081	MH	6170			6.16	475	3.99	7.67			2.20	314	1.50	1.91	2.34	11.92	PVC	200	201.2	0.55	93.5	18.93	37%	0.60	82.82	82.62	82.78	82.58	85.47	85.47	85.45	n/a	n/a	n/a
Decoeur Drive	MH	6100	MH	6110	0.31	31.0	0.31	14	4.00	0.23							0.09	0.31	PVC	200	201.2	1.30	82.5	36.49	99%	1.15	84.87	84.67	84.05	83.85	86.51	85.51	85.51	86.16	0.65	YES
Soulpin Street	MH	6108	MH	6109	0.33	33.0	0.44	27	4.00	0.44	2.20	350.0	2.52	350	1.50	2.19	0.83	3.45	PVC	200	201.2	0.55	20.0	18.93	82%	0.60	84.30	84.00	83.94	83.64	86.44	85.92	85.91	86.13	0.90	YES
Soulpin Street	MH	6109	MH	6110			0.44	27	4.00	0.44			2.52	350	1.50	2.19	0.83	3.45	PVC	200	201.2	0.55	70.0	18.93	82%	0.60	83.84	83.64	83.79	83.59	85.91	85.91	85.91	n/a	n/a	n/a
Decoeur Drive	MH	6110	MH	6111	0.15	7.5	0.91	44	4.00	0.71			2.52	350	1.50	2.19	0.96	3.86	PVC	200	201.2	0.55	92.0	18.93	80%	0.60	83.73	83.53	83.57	83.37	86.51	85.51	85.50	86.06	0.55	YES
Decoeur Drive	MH	6111	MH	6112	0.31	35.0	1.42	80	4.00	1.30			2.52	350	1.50	2.19	1.10	4.59	PVC	200	201.2	0.55	88.0	10.93	76%	0.60	83.57	83.37	83.29	83.09	85.50	85.50	85.49	86.00	0.50	YES
Decoeur Drive	MH	6112	MH	6170	0.73	88.0	2.15	143	4.00	2.32			2.52	350	1.50	2.19	1.31	5.51	PVC	200	201.2	0.55	88.0	10.93	69%	0.60	83.29	83.09	82.38	82.78	85.49	85.48	85.45	85.96	0.48	YES

SANITARY SEWER COMPUTATION FORM

Table 22

DATE: **March, 2018**
DESIGNED BY: PLM
CHECKED BY: AGS

PROJECT: Neighbourhood 5 - Avalon Encore - Stage 6
CLIENT: Minto Communities Inc.
PROJECT #: 170401
BY: ATREL ENGINEERING LTD

q= 350 l/cap.day
i= 0.28 l/ha.s
PVC/CONC N= 0.013
OTHER N= 0.024

Townhouse= 2.7 person/unit
Back to Back= 2.7 person/unit
Single Dwellings= 3.4 person/unit

STREET NAMES	LOCATION FROM (Up)		TO (Down)		RESIDENTIAL INDIVIDUAL AREA (ha.)	POP.	CUMULATIVE AREA (ha.)	POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	COMMERCIAL, INSTITUTIONAL INDIVIDUAL AREA (ha.)	POP.	CUMULATIVE AREA (ha.)	POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	PEAK EXT.FLOW Q(i) (L/S)	PEAK DES. Q(d) (L/S)	SEWER DATA TYPE PIPE	DIA. (NOM) (mm)	DIA. (ACT) (MM)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	Upstream Obv. (M)	Inv. (M)	Downstream Obv. (M)	Inv. (M)	HGL at UP-MH (M)	HGL Orifice UP-MH (M)	HGL at Down MH (M)	USF ELEV. (M)	FREEBOARD HGL (M)	FREEBOARD REQUIREMENT SATISFIED
Easement	MH	6119	MH	6120	0.33	23	0.37	7	4.00	0.11							0.10	0.22	PVC	200	201.2	0.65	35.0	26.86	99%	0.84	85.70	85.50	85.47	85.27	85.49	85.48	85.48	n/a	n/a	n/a
Gardenpost Terrace	MH	6120	MH	6121	0.33	23.0	1.16	83	4.00	1.34							0.92	1.97	PVC	200	201.2	0.25	120.0	18.93	91%	0.60	85.41	85.21	85.02	84.82	85.48	85.48	85.48	86.07	0.59	YES
Gardenpost Terrace	MH	6121	MH	6126	0.33	23.0	2.06	175	4.00	2.84							0.58	3.41	PVC	200	201.2	0.25	120.0	18.93	82%	0.60	85.02	84.82	84.63	84.43	85.48	85.48	85.47	85.78	0.30	YES
Gardenpost Terrace	MH	6125	MH	6126	0.33	23.0	0.33	22	4.00	0.36							0.08	0.44	PVC	200	201.2	0.65	35.0	26.86	98%	0.84	84.99	84.79	84.63	84.43	85.47	85.47	85.47	85.77	0.30	YES
Gussy Grove	MH	6126	MH	6160	0.33	23.0	2.71	224	4.00	3.63							0.76	4.39	PVC	200	201.2	1.35	75.0	40.11	89%	1.26	84.57	84.37	83.47	83.27	85.47	85.47	85.46	85.78	0.31	YES
Gardenpost Terrace	MH	6130	MH	6140	0.13	13.0	0.19	14	4.00	0.23							0.05	0.28	PVC	200	201.2	0.20	37.5	36.49	99%	1.15	85.04	84.84	84.59	84.39	85.52	85.52	85.52	85.88	0.36	YES
Site Plan	MH	6139	MH	6140	0.83	173.0	0.81	173	4.00	2.80							0.23	3.03	PVC	200	201.2	0.22	80.0	18.93	84%	0.60	84.09	83.89	84.05	83.85	85.52	85.52	85.52	n/a	n/a	n/a
Gardenpost Terrace	MH	6140	MH	6141	0.33	50	1.06	193	4.00	3.13							0.30	3.43	PVC	200	201.2	0.22	77.0	18.93	82%	0.60	83.99	83.79	83.94	83.74	85.52	85.52	85.52	85.88	0.36	YES
Gardenpost Terrace	MH	6141	MH	6142			1.06	193	4.00	3.13							0.30	3.43	PVC	200	201.2	0.22	77.0	18.93	82%	0.60	83.91	83.71	83.88	83.69	85.52	85.52	85.52	n/a	n/a	n/a
Gardenpost Terrace	MH	6142	MH	6150	0.33	50	1.39	196	4.00	3.18							0.34	3.51	PVC	200	201.2	0.22	80.5	18.93	81%	0.60	83.85	83.65	83.72	83.52	85.52	85.52	85.52	85.92	0.30	YES
Park	MH	6149	MH	6150	0.33	15.0	0.66	15	4.00	0.24							0.25	0.49	PVC	300	201.2	0.65	40.0	26.06	98%	0.64	83.71	83.51	83.64	83.44	85.52	85.52	85.52	n/a	n/a	n/a
Gardenpost Terrace	MH	6150	MH	6151	0.50	23.0	2.69	265	4.00	4.29							0.75	5.04	PVC	200	201.2	0.22	80.0	18.93	73%	0.60	83.58	83.38	83.22	83.02	85.52	85.52	85.49	85.82	0.30	YES
Gardenpost Terrace	MH	6151	MH	6160	0.50	23.0	3.19	314	4.00	5.09							0.99	5.96	PVC	200	201.2	0.22	80.0	18.93	68%	0.60	83.22	83.02	82.96	82.76	85.49	85.49	85.46	85.81	0.32	YES
Gussy Grove	MH	6160	MH	6161			5.89	538	3.95	8.93							1.66	10.77	PVC	300	298.2	0.20	75.0	42.94	75%	0.61	82.87	82.57	82.86	82.56	85.46	85.46	85.46	85.80	0.34	YES
Gussy Grove	MH	6161	MH	6170	0.33	13.0	6.21	563	3.95	9.00							1.74	10.74	PVC	300	298.2	0.20	75.0	42.94	75%	0.61	82.86	82.56	82.71	82.41	85.46	85.46	85.45	85.78	0.32	YES
Decoeur Drive	MH	6170	MH	5050	0.18		14.70	1101	3.75	17.95			4.72	574	1.50	4.10	5.44	27.49	PVC	300	298.2	0.30	75.5	42.94	36%	0.61	82.60	82.30	82.44	82.14	85.45	85.45	85.38	n/a	n/a	n/a
Jerome Jodoin	MH	5040	MH	5041	0.33	23.0	0.56	45	4.00	0.73							0.16	0.89	PVC	200	201.2	0.65	35.0	26.86	97%	0.64	84.66	84.46	84.23	84.03	85.38	85.38	85.38	85.72	0.34	YES
Jerome Jodoin	MH	5041	MH	5050	0.33	23.0	1.12	89	4.00	1.44							0.31	1.76	PVC	200	201.2	0.22	80.0	18.93	91%	0.60	84.23	84.03	83.93	83.73	85.38	85.38	85.38	85.74	0.36	YES
Decoeur Drive	MH	5050	MH	5051			21.50	1606	3.69	23.00			12.40	1772	1.50	10.77	9.49	44.05	CONC	450	457.2	0.11	70.0	98.65	55%	0.60	82.44	81.99	82.42	81.97	85.38	85.37	85.37	n/a	n/a	n/a
Decoeur Drive	MH	5051	MH	5052	0.33	23.0	22.11	1644	3.65	24.31			12.40	1772	1.50	10.77	9.66	44.74	CONC	450	457.2	0.11	70.0	98.38	55%	0.60	82.42	81.97	82.31	81.86	85.37	85.37	85.35	85.79	0.42	YES
Park	MH	Stub 43	MH	5052	0.33	23.0	3.78	64	4.00	0.88							1.06	1.93	PVC	200	201.2	0.65	35.0	18.93	90%	0.60	84.00	83.80	83.95	83.75	85.35	85.35	85.35	n/a	n/a	n/a
Decoeur Drive	MH	5052	MH	5055	0.33	23.0	26.42	1729	3.63	25.45			12.40	1772	1.50	10.77	10.87	47.09	CONC	450	457.2	0.11	70.0	98.65	52%	0.60	82.31	81.86	82.20	81.75	85.35	85.35	85.33	85.80	0.45	YES
Mountain Sorrel Way	MH	5000	MH	5002	0.33	23.0	0.37	41	4.00	0.66							0.10	0.77	PVC	200	201.2	0.65	40.0	26.86	97%	0.64	85.41	85.21	84.64	84.44	85.55	85.55	85.55	87.11	1.56	YES
Mountain Sorrel Way	MH	5001	MH	5002	0.33	23.0	0.27	19	4.00	0.31							0.08	0.38	PVC	200	201.2	0.09	75.0	33.31	99%	1.05	85.40	85.20	84.64	84.44	85.55	85.55	85.55	86.28	0.73	YES
Vendome Street	MH	5002	MH	5000	0.13	9.0	0.73	63	4.00	1.02							0.21	1.23	PVC	200	201.2	0.33	97.0	18.93	94%	0.60	84.58	84.38	84.43	84.23	85.55	85.55	85.55	86.20	0.65	YES
Mountain Sorrel Way	MH	5006	MH	5006	0.33	23.0	0.37	39	4.00	0.62							0.10	0.72	PVC	200	201.2	0.65	35.0	26.86	97%	0.64	85.41	85.21	85.05	84.85	85.55	85.55	85.55	86.17	0.62	YES
Mountain Sorrel Way	MH	5006	MH	5008	0.33	23.0	0.80	87	4.00	1.41							0.22	1.63	PVC	200	201.2	0.22	75.0	18.93	91%	0.60	85.05	84.85	84.79	84.59	85.55	85.55	85.55	86.08	0.53	YES
Vendome Street	MH	5008	MH	5013	0.33	23.0	1.88	177	4.00	2.87							0.53	3.39	PVC	200	201.2	0.22	85.5	18.93	82%	0.60	84.43	84.23	84.17	83.97	85.55	85.55	85.54	86.14	0.59	YES
Hyssop Street	MH	5010	MH	5011	0.33	23.0	0.27	22	4.00	0.35							0.08	0.43	PVC	200	201.2	0.65	35.0	26.86	98%	0.64	84.71	84.51	84.37	84.17	85.54	85.54	85.54	86.07	0.53	YES
Hyssop Street	MH	5011	MH	5012	0.33	23.0	0.66	47	4.00	0.76							0.18	0.92	PVC	200	201.2	0.22	80.0	18.93	95%	0.60	84.37	84.17	84.22	84.02	85.54	85.54	85.54	86.01	0.47	YES
Hyssop Street	MH	5012	MH	5013	0.33	23.0	0.91	72	4.00	1.17							0.23	1.39	PVC	200	201.2	0.22	35.0	18.93	93%	0.60	84.22	84.02	84.11	83.91	85.54	85.54	85.54	85.98	0.44	YES
Hyssop Street	MH	5013	MH	5017	0.33	23.0	3.00	274	4.00	4.44							0.84	5.28	PVC	200	201.2	0.22	75.0	18.93	72%	0.60	84.11	83.91	83.96	83.66	85.54	85.54	85.52	86.11	0.57	YES
Mountain Sorrel Way	MH	105001	MH	5017	0.33	23.0	0.04	81	4.00	1.31							0.24	1.55	PVC	200	201.2	0.65	35.0	33.31	95%	1.05	84.93	84.73	83.67	83.47	85.52	85.52	85.52	86.14	0.62	YES
Mountain Sorrel Way	MH	5017	MH	5024	0.33	23.0	4.19	385	4.00	6.24							1.17	7.41	PVC	200	201.2	0.22	75.0	18.93	61%	0.60	83.67	83.47	83.42	83.22	85.52	85.52	85.48	86.11	0.59	YES
June Grass Street	MH	5020	MH	5021	0.33	23.0	0.35	30	4.00	0.49							0.10	0.59	PVC	200	201.2	0.65	27.0	26.06	98%	0.64	85.22	85.02	84.76	84.56	85.49	85.49	85.48	86.15	0.67	YES
June Grass Street	MH	5021	MH	5022	0.33	23.0	0.47	36	4.00	0.58							0.13	0.71	PVC	200	201.2	0.22	80.0	18.93	96%	0.60	84.75	84.55	84.71	84.51	85.49	85.49	85.48	86.21	0.73	YES
June Grass Street	MH	5022	MH	5023	0.33	23.0	1.02	80	4.00	1.46							0.29	1.74	PVC	200	201.2	0.22	75.0	18.93	91%	0.60	84.50	84.40	84.47	84.27	85.49	85.49	85.48	86.08	0.60	YES
June Grass Street	MH	5023	MH	5024	0.33	23.0	1.42	126	4.00	2.07							0.40	2.47	PVC	200	201.2	0.22	75.0	18.93	87%	0.60	84.25	84.05	84.02	83.82	85.49	85.49	85.48	86.08	0.60	YES
Mountain Sorrel Way	MH	5024	MH	5025	0.33	23.0	5.92	543	3.99	8.70							1.66	10.36	PVC	300	201.2	0.22	80.0	18.93	45%	0.60	83.42	83.22	83.29	83.09	85.49	85.49	85.44	86.06	0.56	YES
Mountain Sorrel Way	MH	5025	MH	5026	0.33	23.0	6.13	567	3.95	8.91							1.72	10.63	PVC	300	201.2	0.22	80.0	18.93	44%	0.60	83.29	83.09	83.13	82.93	85.44	85.44	85.39	86.08	0.64	YES
School No.2	MH	Stub 22	MH	5030							3.55	600.0	2.96	409	1.50	2.49	0.90	3.39	PVC	200	201.2	0.65	12.5	26.86	88%	0.64	84.09	83.89	84.00	83.80	85.42	85.42	85.42	n/a	n/a	n/a
Decoeur Drive	MH	5030	MH	5031	0.33	23.0	0.42	30	4.00	0.49			2.96	409	1.50	2.49	0.92	3.89	PVC	200	201.2	0.65	35.0	26.86	85%	0.64	83.94	83.74	83.43	83.23	85.42	85.42	85.41	86.88	0.47	YES
Decoeur Drive	MH	5031	MH	5032	0.33	23.0	0.59	49	4.00	0.79			2.96	409	1.50	2.49	0.99	4.27	PVC	200	201.2	0.65	42.5	18.93	77%	0.60	83.43	83.23	83.29	83.09	85.41	85.41	85.40	86.01	0.60	YES
Decoeur Drive	MH	5032	MH	5026	0.33	23.0	1.00	60	4.00	1.10			2.96	409	1.50	2.49	1.00	4.57	PVC	200	201.2	0.65	25.0	18.93	75%	0.60	83.29	83.09	83.13	82.93	85.40	85.40	85.39	85.85	0.45	YES

SANITARY SEWER COMPUTATION FORM

Table 22

DATE: **March, 2018**
DESIGNED BY: PLM
CHECKED BY: AGS

PROJECT: Neighbourhood 5 - Avalon Encore - Stage 6
CLIENT: Minto Communities Inc.
PROJECT #: 170401
BY: ATREL ENGINEERING LTD

q= 350 l/cap.day
i= 0.28 l/ha.s
PVC/CONC N= 0.013
OTHER N= 0.024

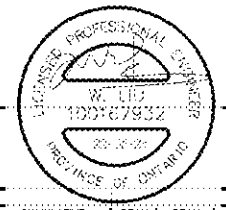
Townhouse= 2.7 person/unit
Back to Back= 2.7 person/unit
Single Dwellings= 3.4 person/unit

STREET NAMES	LOCATION FROM (Up)		TO (Down)		RESIDENTIAL INDIVIDUAL AREA (ha.)	POP.	CUMULATIVE AREA (ha.)	POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	COMMERCIAL, INSTITUTIONAL INDIVIDUAL AREA (ha.)	POP.	CUMULATIVE AREA (ha.)	POP.	PEAKING FACTOR M	FLOW Q(p) (L/S)	PEAK EXT. FLOW Q(i) (L/S)	PEAK DES. Q(d) (L/S)	SEWER DATA TYPE PIPE	DIA. (NOM) (mm)	DIA. (ACT) (MM)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	Upstream Obv. (M)	Upstream Inv. (M)	Downstream Obv. (M)	Downstream Inv. (M)	HGL at UP-MH (M)	HGL Obt UP-MH (M)	HGL at Down MH (M)	USF ELEV. (M)	FREEBOARD HGL (M)	FREEBOARD REQUIREMENT SATISFIED
Deppeur Drive	MH	5035	MH	5036	0.31	53.0	7.84	685	3.80	10.82			2.86	409	1.50	2.48	3.00	16.30	PVC	300	299.2	0.30	55.3	42.94	62%	0.61	83.13	82.83	82.95	82.65	85.39	85.39	85.36	86.04	0.65	YES
Deppeur Drive	MH	5036	MH	5055	0.32	53.0	8.42	719	3.89	11.32			2.86	409	1.50	2.48	3.16	16.97	PVC	300	299.2	0.30	108.5	42.94	60%	0.61	82.75	82.45	82.53	82.23	85.36	85.36	85.33	86.00	0.64	YES
Lesturgeon Street	MH	5055	MH	5056	0.00	0.0	34.93	2452	3.52	34.92			15.26	2181	1.50	13.25	14.06	62.23	CONC	450	457.2	0.11	45.0	98.65	37%	0.60	82.14	81.69	82.09	81.64	85.33	85.32	85.30	86.00	0.66	YES
Lesturgeon Street	MH	5055	MH	5070	0.00	0.0	35.66	2510	3.51	35.66			15.26	2181	1.50	13.25	14.26	63.17	CONC	450	457.2	0.11	105.0	98.65	36%	0.60	82.09	81.64	81.98	81.53	85.30	85.30	85.25	85.74	0.44	YES
Lesturgeon Street	MH	5060	MH	5063	0.00	0.0	0.39	27	4.00	0.34							0.11	0.45	PVC	200	201.2	0.55	53.5	26.86	98%	0.84	84.81	84.61	84.34	84.14	85.28	85.28	85.28	85.63	0.35	YES
Du Malachigan Cres.	MH	5061	MH	5062	0.00	0.0	0.10	4	4.00	0.06							0.03	0.09	PVC	200	201.2	0.55	53.0	26.86	100%	0.84	84.56	84.36	84.50	84.30	85.28	85.28	85.28	85.59	0.31	YES
Du Malachigan Cres.	MH	5062	MH	5063	0.00	0.0	0.79	52	4.00	0.84							0.22	1.06	PVC	200	201.2	0.55	55.0	22.98	95%	0.71	84.22	84.02	83.90	83.60	85.28	85.28	85.28	85.60	0.32	YES
Lesturgeon Street	MH	5063	MH	5066	0.00	0.0	1.54	94	4.00	1.52							0.42	1.95	PVC	200	201.2	0.55	55.0	18.93	90%	0.60	83.74	83.54	83.49	83.29	85.28	85.28	85.28	85.63	0.35	YES
Du Malachigan Cres.	MH	105061	MH	5064	0.00	0.0	0.43	24	4.00	0.39							0.12	0.51	PVC	200	201.2	0.55	53.5	26.86	98%	0.84	84.44	84.24	84.04	83.84	85.28	85.28	85.28	85.76	0.48	YES
Du Malachigan Cres.	MH	5064	MH	5065	0.00	0.0	0.61	31	4.00	0.50							0.17	0.67	PVC	200	201.2	0.55	53.0	18.93	95%	0.60	84.01	83.81	83.97	83.77	85.28	85.28	85.28	85.06	0.78	YES
Du Malachigan Cres.	MH	5065	MH	5066	0.00	0.0	1.35	82	4.00	1.33							0.38	1.71	PVC	200	201.2	0.55	107.0	18.90	91%	0.59	83.94	83.74	83.60	83.40	85.28	85.28	85.28	85.64	0.36	YES
Lesturgeon Street	MH	5066	MH	5067	0.00	0.0	3.20	193	4.00	3.13							0.90	4.02	PVC	200	201.2	0.55	57.0	26.65	85%	0.64	83.49	83.29	83.06	82.86	85.28	85.28	85.27	85.63	0.35	YES
Lesturgeon Street	MH	5067	MH	5068	0.00	0.0	3.49	200	4.00	3.24							0.97	4.22	PVC	200	201.2	0.55	53.0	18.93	78%	0.60	82.46	82.26	82.41	82.21	85.27	85.27	85.27	85.65	0.38	YES
Lesturgeon Street	MH	5068	MH	5070	0.00	0.0	4.06	238	4.00	3.99							1.14	4.99	PVC	200	201.2	0.55	53.0	18.93	74%	0.60	82.38	82.18	82.12	81.92	85.27	85.27	85.25	85.67	0.40	YES
Hepatica Way	MH	5070	MH	5083	0.00	0.0	40.04	2765	3.47	39.89			15.26	2181	1.50	13.25	15.48	67.63	CONC	450	457.2	0.11	25.0	98.65	31%	0.60	81.92	81.47	81.84	81.39	85.25	85.25	85.21	85.72	0.47	YES
Du Maskinonge Cres.	MH	5080	MH	5081	0.00	0.0	0.40	28	4.00	0.45							0.11	0.57	PVC	200	201.2	0.55	42.0	26.86	98%	0.84	85.11	84.91	84.81	84.61	85.21	85.21	85.21	85.77	0.56	YES
Du Maskinonge Cres.	MH	5081	MH	5083	0.00	0.0	1.15	79	4.00	1.23							0.32	1.55	PVC	200	201.2	0.55	53.0	18.93	92%	0.60	84.75	84.55	84.39	84.19	85.21	85.21	85.21	85.67	0.46	YES
Hepatica Way	MH	5083	MH	5087	0.00	0.0	41.54	2862	3.46	40.11			15.26	2181	1.50	13.25	15.90	69.27	CONC	450	457.2	0.11	20.0	98.65	30%	0.60	81.84	81.39	81.75	81.30	85.21	85.21	85.17	85.56	0.39	YES
Du Maskinonge Cres.	MH	105080	MH	5084	0.00	0.0	0.39	24	4.00	0.39							0.09	0.48	PVC	200	201.2	0.55	53.0	26.86	99%	0.84	85.15	84.95	84.87	84.67	85.17	85.17	85.17	85.81	0.64	YES
Du Maskinonge Cres.	MH	5084	MH	5085	0.00	0.0	0.60	35	4.00	0.57							0.17	0.74	PVC	200	201.2	0.55	53.0	18.93	95%	0.60	84.84	84.64	84.79	84.59	85.17	85.17	85.17	85.95	0.78	YES
Du Maskinonge Cres.	MH	5085	MH	5086	0.00	0.0	1.07	66	4.00	1.07							0.30	1.37	PVC	200	201.2	0.55	53.0	18.93	93%	0.60	84.76	84.56	84.53	84.33	85.17	85.17	85.17	85.67	0.50	YES
Du Maskinonge Cres.	MH	5086	MH	5087	0.00	0.0	1.50	94	4.00	1.52							0.42	1.94	PVC	200	201.2	0.55	53.0	18.93	90%	0.60	84.53	84.33	84.30	84.10	85.17	85.17	85.17	85.64	0.47	YES
Hepatica Way	MH	5087	MH	5088	0.00	0.0	43.92	3018	3.44	42.06			15.26	2181	1.50	13.25	15.67	71.38	CONC	450	457.2	0.11	20.0	98.65	27%	0.60	81.75	81.30	81.62	81.17	85.17	85.17	85.10	85.47	0.30	YES
Hepatica Way	MH	5088	MH	5089	0.00	0.0	44.14	3032	3.44	42.23			15.26	2181	1.50	13.25	15.63	72.12	CONC	450	457.2	0.11	20.0	98.65	27%	0.60	81.62	81.17	81.59	81.14	85.10	85.10	85.06	85.40	0.30	YES
Hepatica Way	MH	5089	MH	3271	0.00	0.0	44.40	3046	3.44	42.41			15.26	2181	1.50	13.25	15.70	72.36	CONC	450	457.2	0.11	51.0	98.65	27%	0.60	81.59	81.14	81.53	81.08	81.56	81.56	81.53	85.39	3.80	YES
Des Autepine Drive	MH	3131	MH	3132	0.00	0.0	0.38	22	4.00	0.36							0.11	0.48	PVC	200	201.2	0.55	53.0	26.86	98%	0.84	84.63	84.63	84.41	84.21	84.41	84.41	84.41	85.94	1.11	YES
Des Autepine Drive	MH	3132	MH	3140	0.00	0.0	0.70	41	4.00	0.66							0.20	0.86	PVC	200 200	201.2	0.55	53.0	26.86	97%	0.84	83.61	83.61	83.39	83.19	83.39	83.39	83.39	85.91	2.10	YES
Yellowcress Way	MH	4112	MH	3140	0.00	0.0	3.28	316	4.00	5.12							0.82	6.04	PVC	200	201.2	0.55	53.0	18.93	68%	0.60	82.66	82.46	82.40	82.20	82.43	83.43	83.40	85.87	2.21	YES
Des Autepine Drive	MH	3140	MH	3141	0.00	0.0	4.36	382	4.00	6.19							1.22	7.41	PVC	150	251.5	0.32	53.0	29.59	75%	0.60	82.39	83.14	82.22	82.97	82.73	83.73	83.22	85.72	2.22	YES
Des Autepine Drive	MH	3141	MH	3141B	0.00	0.0	4.66	404	4.00	6.55							1.31	7.86	PVC	150	251.5	0.32	53.0	29.59	73%	0.60	82.22	82.97	82.08	82.83	82.08	83.08	83.08	85.85	2.62	YES
School No.1	MH	Stub 101	MH	3141B							2.35	353.0	2.45	349	1.50	2.12	0.59	2.91	PVC	150	150.2	0.50	70.0	44.59	94%	2.52	85.03	84.88	83.58	83.43	83.59	83.59	83.58	n/a	n/a	n/a
Des Autepine Drive	MH	3141B	MH	3142	0.00	0.0	5.14	416	4.00	6.74			2.45	349	1.50	2.12	2.13	10.99	PVC	200	251.5	0.32	53.0	29.59	63%	0.60	82.09	82.89	82.93	82.69	82.95	82.95	82.93	85.92	2.74	YES
Des Autepine Drive	MH	3142	MH	3143	0.00	0.0	5.69	444	4.00	7.19			2.45	349	1.50	2.12	2.28	11.59	PVC	200	251.5	0.32	53.0	29.59	61%	0.60	82.93	82.68	82.59	82.44	82.73	82.73	82.69	85.43	2.61	YES
Des Autepine Drive	MH	3143	MH	3270	0.00	0.0	6.44	492	3.98	7.93			2.45	349	1.50	2.12	2.49	12.54	PVC	200	251.5	0.32	53.0	29.59	58%	0.60	82.69	82.44	82.40	82.15	82.45	82.45	82.40	85.36	2.67	YES
Hepatica Way	MH	3271	MH	3272	0.00	0.0	51.52	3583	3.38	49.80			17.71	2530	1.50	15.37	19.38	83.75	CONC	525	533.4	0.11	55.0	148.80	44%	0.67	81.53	81.00	81.42	80.89	81.45	81.45	81.42	85.40	3.88	YES
Hepatica Way	MH	3272	MH	3273	0.00	0.0	52.35	3641	3.37	49.78			17.71	2530	1.50	15.37	19.62	84.69	CONC	525	533.4	0.11	55.0	149.46	43%	0.67	81.42	80.89	81.29	80.76	81.33	81.33	81.29	85.35	3.92	YES
Magnolia Street	MH	3124	MH	3273	0.00	0.0	8.46	571	3.94	9.12	4.22	353.0	4.78	683	1.50	4.15	3.71	16.98	PVC	300	299.2	0.12	75.0	41.86	59%	0.60	81.55	81.25	81.40	81.10	81.42	81.42	81.40	85.57	4.02	YES
Hepatica Way	MH	3273	MH	3274	0.00	0.0	81.30	4243	3.31	56.98			22.49	3213	1.50	19.52	23.46	99.98	CONC	525	533.4	0.11	55.0	149.46	33%	0.67	81.29	80.76	81.20	80.67	81.24	81.24	81.20	85.54	4.26	YES
Hepatica Way	MH	3274	MH	3275	0.00	0.0	81.90	4281	3.31	57.35			22.49	3213	1.50	19.52	23.63	100.50	CONC	525	533.4	0.11	55.0	149.46	33%	0.67	81.20	80.67	81.10	80.57	81.14	81.14	81.10	85.59	4.30	YES
Hepatica Way	MH	3275	MH	3276	0.00	0.0	81.90	4281	3.31	57.35			22.49	3213	1.50	19.52	23.63	100.50	CONC	525	533.4	0.11	55.0	149.46	33%	0.67	81.10	80.57	81.00	80.46	81.09	81.09	81.09	n/a	n/a	n/a
Hepatica Way	MH	3276	MH	15166			81.90	4281	3.31	57.35			22.49	3213	1.50	19.52	23.63	100.50	CONC	525	566.8	0.12	34.5	303.76	66%	0.82	81.09	80.41	81.05	80.37	81.05	81.05	81.05	n/a	n/a	n/a

Existing Sanitary Sewers
Proposed Avalon Encore Stage 6 Sanitary Sewers

000147

SANITARY SEWER CALCULATION SHEET



Manning's n=0.013

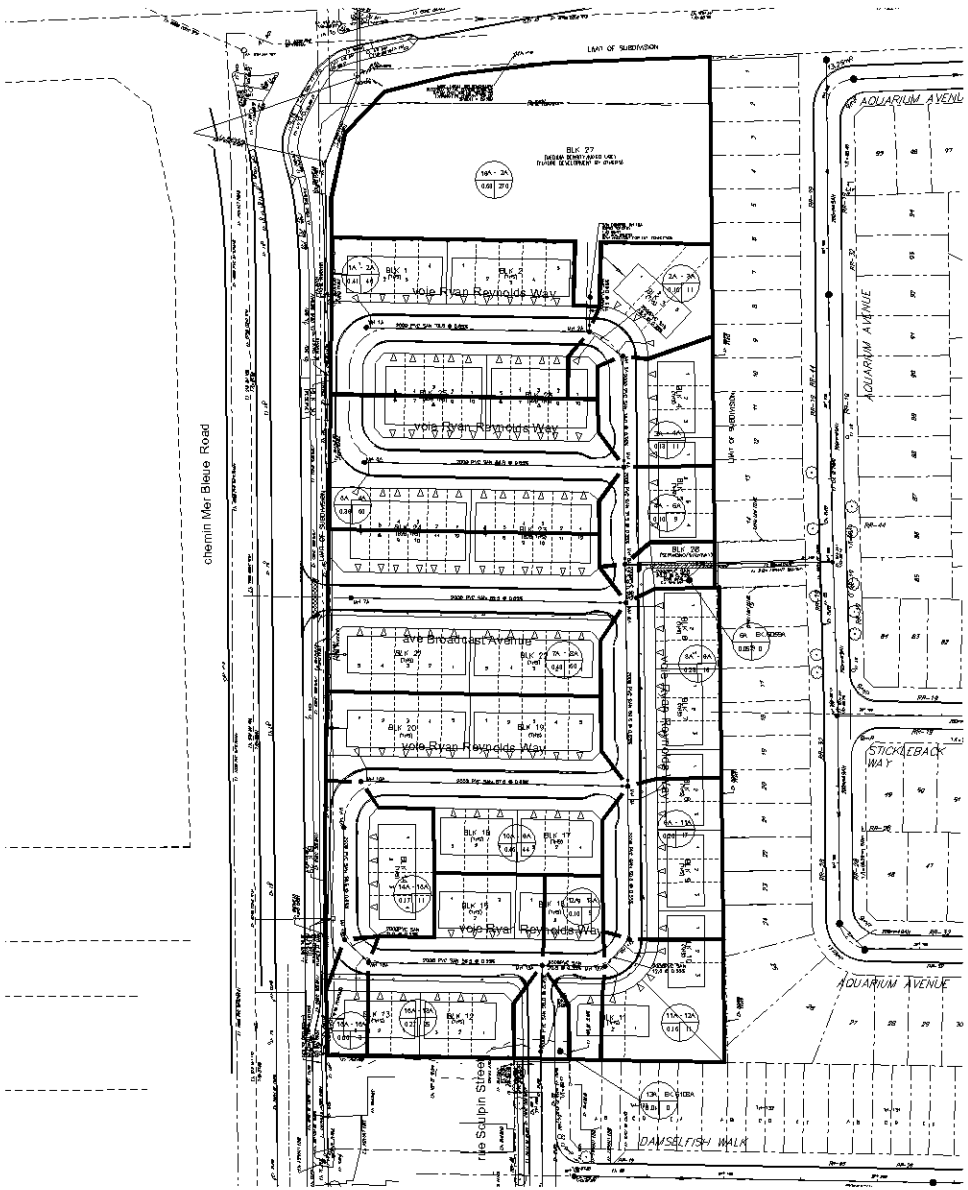
LOCATION			RESIDENTIAL AREA AND POPULATION									COMM		INSTIT		PARK		C+I+I	INFILTRATION				PIPE						
STREET	FROM M.H.	TO M.H.	AREA (ha)	UNITS	UNITS Singles	UNITS Townhouse	POP.	CUMULATIVE AREA (ha)	CUMULATIVE POP.	PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL (FULL) (m/s)	VEL (ACT.) (m/s)
ave Broadcast Avenue																													
	7A	8A	0.48	22		22	60	0.48	60	3.64	0.71		0.00		0.00		0.00	0.00	0.48	0.48	0.16	0.87	89.5	200	0.65	26.44	0.03	0.84	0.38
To voie Ryan Reynolds Way, Pipe 8A - 6A								0.48	60				0.00		0.00		0.00			0.48									
BLOCK 27																													
	19A	2A	0.68	150			270	0.68	270	3.48	3.04		0.00		0.00		0.00	0.00	0.68	0.68	0.22	3.27	11.5	200	0.65	26.44	0.12	0.84	0.57
To voie Ryan Reynolds Way, Pipe 2A - 3A								0.68	270				0.00		0.00		0.00			0.68									
BLOCK 28																													
Contribution From voie Ryan Reynolds Way, Pipe 4A - 6A								1.86	410				0.00		0.00		0.00		1.86	1.86									
Contribution From voie Ryan Reynolds Way, Pipe 8A - 6A								0.48	60				0.00		0.00		0.00		0.48	2.34									
	6A	6059A	0.05				0	2.39	470	3.39	5.16		0.00		0.00		0.00	0.00	0.05	2.39	0.79	5.95	25.0	200	0.35	19.40	0.31	0.62	0.54
voie Ryan Reynolds Way																													
	5A	4A	0.39	22		22	60	0.39	60	3.64	0.71		0.00		0.00		0.00	0.00	0.39	0.39	0.13	0.84	84.5	200	0.65	26.44	0.03	0.84	0.38
	80A	9A	0.23	7		7	19	0.23	19	3.71	0.23		0.00		0.00		0.00	0.00	0.23	0.23	0.08	0.30	59.5	200	0.65	26.44	0.01	0.84	0.28
Contribution From ave Broadcast Avenue, Pipe 7A - 8A								0.48	60				0.00		0.00		0.00		0.48	0.48									
	8A	6A						0.48	60	3.64	0.71		0.00		0.00		0.00	0.00	0.00	0.48	0.16	0.87	12.5	200	0.35	19.40	0.04	0.62	0.31
To BLOCK 28, Pipe 6A - 18A								0.48	60				0.00		0.00		0.00			0.48									
	14A	15A	0.17	4		4	11	0.17	11	3.73	0.13		0.00		0.00		0.00	0.00	0.17	0.17	0.06	0.19	36.5	200	0.65	26.44	0.01	0.84	0.24
	15A	16A	0.05	1		1	3	0.22	14	3.72	0.17		0.00		0.00		0.00	0.00	0.05	0.22	0.07	0.24	11.0	200	0.35	19.40	0.01	0.62	0.21
	16A	13A	0.27	9		9	25	0.49	39	3.67	0.46		0.00		0.00		0.00	0.00	0.27	0.49	0.16	0.63	56.5	200	0.35	19.40	0.03	0.62	0.28
To SCULPIN STREET, Pipe 13A - 17A								0.49	39				0.00		0.00		0.00			0.49									
	10A	9A	0.45	16		16	44	0.45	44	3.66	0.52		0.00		0.00		0.00	0.00	0.45	0.45	0.15	0.67	87.0	200	0.65	26.44	0.03	0.84	0.35
	9A	11A	0.20	6		6	17	0.88	80	3.62	0.94		0.00		0.00		0.00	0.00	0.20	0.88	0.29	1.23	50.0	200	0.35	19.40	0.06	0.62	0.34
	11A	12A	0.16	4		4	11	1.04	91	3.60	1.06		0.00		0.00		0.00	0.00	0.16	1.04	0.34	1.41	12.0	200	0.35	19.40	0.07	0.62	0.36
	12A	13A	0.10	3		3	9	1.14	100	3.59	1.17		0.00		0.00		0.00	0.00	0.10	1.14	0.38	1.54	20.5	200	0.35	19.40	0.08	0.62	0.37
To SCULPIN STREET, Pipe 13A - 17A								1.14	100				0.00		0.00		0.00			1.14									
	1A	2A	0.41	18		18	49	0.41	49	3.65	0.58		0.00		0.00		0.00	0.00	0.41	0.41	0.14	0.72	72.5	200	0.65	26.44	0.03	0.84	0.36
Contribution From BLOCK 27, Pipe 19A - 2A								0.68	270				0.00		0.00		0.00		0.68	1.09									
	2A	3A	0.15	4		4	11	1.24	330	3.45	3.69		0.00		0.00		0.00	0.00	0.15	1.24	0.41	4.10	13.5	200	0.35	19.40	0.21	0.62	0.49
	3A	4A	0.13	4		4	11	1.37	341	3.44	3.81		0.00		0.00		0.00	0.00	0.13	1.37	0.45	4.26	36.0	200	0.35	19.40	0.22	0.62	0.49
	4A	6A	0.10	3		3	9	1.86	410	3.41	4.54		0.00		0.00		0.00	0.00	0.10	1.86	0.61	5.15	31.5	200	0.35	19.40	0.27	0.62	0.52
To BLOCK 28, Pipe 6A - 18A								1.86	410				0.00		0.00		0.00			1.86									
SCULPIN STREET																													
Contribution From voie Ryan Reynolds Way, Pipe 12A - 13A								1.14	100				0.00		0.00		0.00		1.14	1.14									
Contribution From voie Ryan Reynolds Way, Pipe 16A - 13A								0.49	39				0.00		0.00		0.00		0.49	1.63									
	13A	6108A	0.04				0	1.67	139	3.56	1.60		0.00		0.00		0.00	0.00	0.04	1.67	0.55	2.16	28.0	200	0.35	19.40	0.11	0.62	0.41

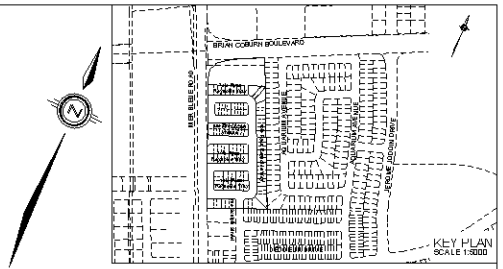
DESIGN PARAMETERS

Park Flow =	9500	L/ha/da	0.11074	l/s/Ha			
Average Daily Flow =	280	l/p/day			Industrial Peak Factor = as per MOE Graph		
Comm/Inst Flow =	28000	L/ha/da	0.3241	l/s/Ha	Extraneous Flow =	0.330	L/s/ha
Industrial Flow =	35000	L/ha/da	0.40509	l/s/Ha	Minimum Velocity =	0.600	m/s
Max Res. Peak Factor =	4.00				Manning's n = (Conc)	0.013	(Pvc) 0.013
Commercial/Inst./Park Peak Factor =	1.00				Townhouse coeff=	2.7	
Institutional =	0.32	l/s/Ha			Single house coeff=	3.4	

Designed: A.K	PROJECT: CASSETTE SUBDIVISION (2275 MER BLEUE ROAD)		
Checked: W.L	LOCATION: City of Ottawa		
Dwg. Reference: Sanitary Drainage Plan, Dwgs. No. 18	File Ref: 2U-1214	Date: Jun 2022	Sheet No. 1 of 1

1214_SAN_DesSheet2.xlsx





LEGEND

- SANITARY DRAINAGE BOUNDARY
- SANITARY SUB-DRAINAGE BOUNDARY
- SANITARY DRAINAGE BOUNDARY (OTHER PHASES)
- UPSTREAM MH TO DOWNSTREAM MH
- AREA IN HECTARES
- POPULATION
- UPSTREAM MH TO DOWNSTREAM MH
- AREA IN OTHER PHASES IN HECTARES
- POPULATION
- EXTERNAL AREA IN HECTARES
- EXTERNAL POPULATION
- DENSITY (PERSONS/HECTARE)
- EXTERNAL LAND USE
- MAINTENANCE HOLE
- CAP
- EXISTING SANITARY MAINTENANCE HOLE

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES, PROJECT No. 20-10-178-00A RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE GEODETIC DATUM (ADV JOB NO. 18048-19) OBTAINED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 99.26m ON THE TOP OF SPINDLE ELEVATED @ = 99.260m

No	BY	DATE	DESCRIPTION
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-06	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

PROFESSIONAL s.21 PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN © DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.dsel.ca

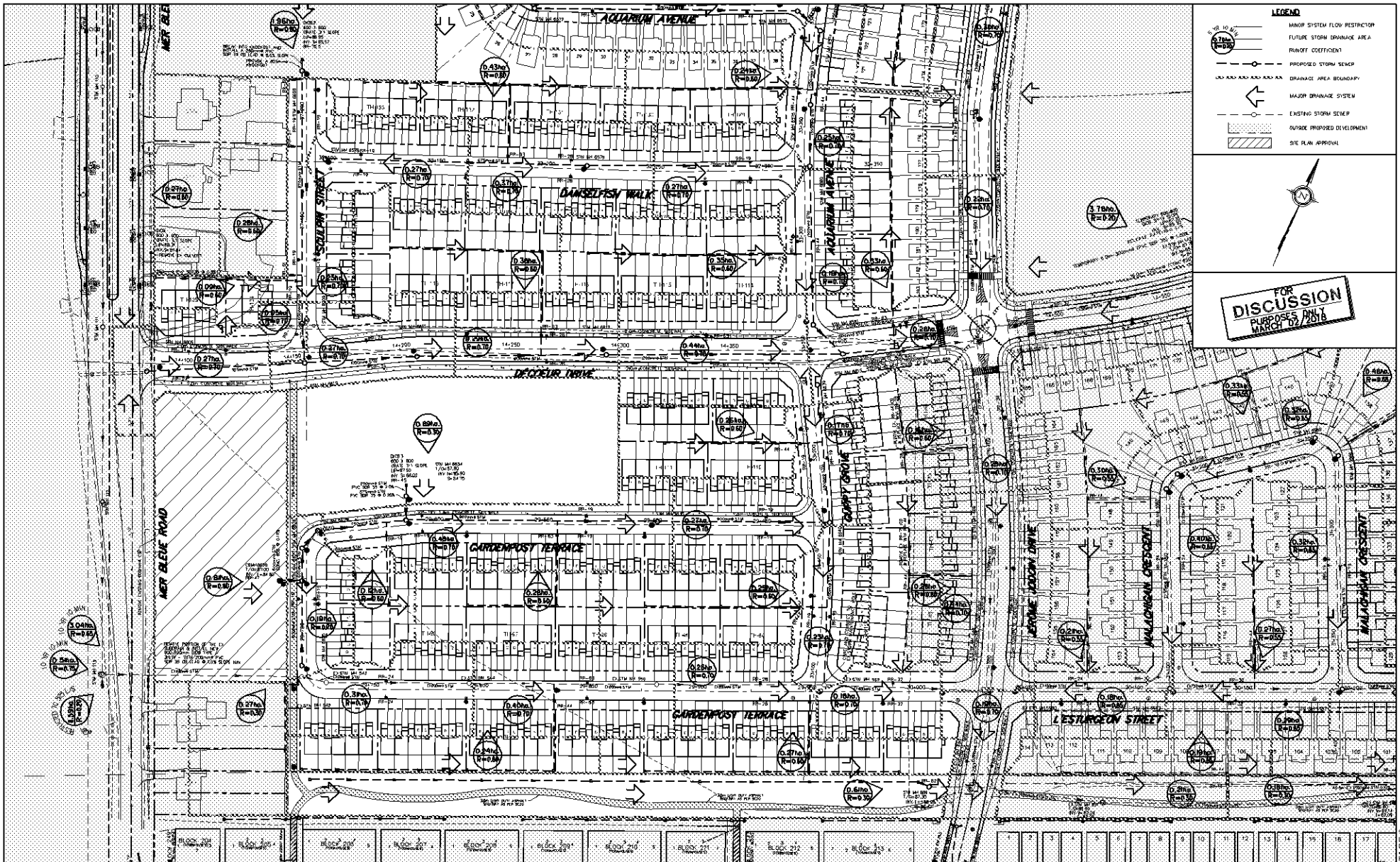
DRAWN BY: A.K./V.R.	CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: C.M.	18
SCALE:	DATE: DECEMBER 2021	

CITY FILE No. D07-16-21-0001 CITY PLAN No. 18616

000150

APPENDIX E

Stormwater Management



THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM

No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY

SCALE 1:750 (0m, 0, 24m)

DESIGN	PLM
CHECKED	AGS
DRAWN	PNC
CHECKED	PLM
APPROVED	AGS

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

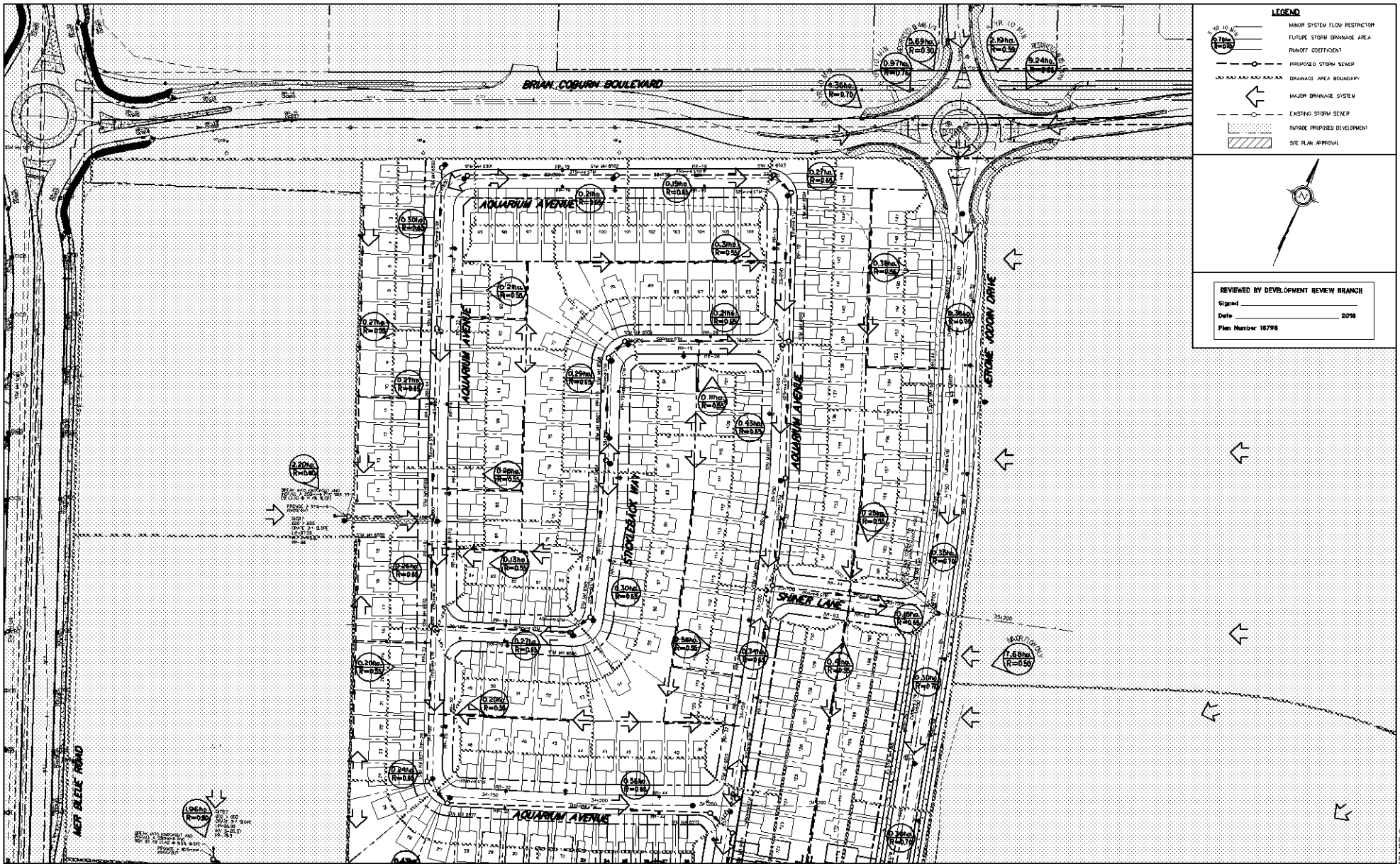
PLAN
STORM DRAINAGE AREA PLAN

CLIENT No. 148
PROJECT No. 170401
DRAWING No. 170401-STM

D07-16-09-0018-STAGE 6

15796

000152



THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY

SCALE 1:750 (0m, 0, 24m)

DESIGN	PLM
CHECKED	AGS
DRAWN	PNC
CHECKED	PLM
APPROVED	AGS

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

PLAN
STORM DRAINAGE AREA PLAN

CLIENT No	148
PROJECT No	170401
DRAWING No	170401-STM2

D07-16-09-0018-STAGE 6

16796

000153

STORM SEWER COMPUTATION FORM

DESIGNED BY: PLM
CHECKED BY: AGS

PROJECT: **Neighbourhood 5 - Avalon Encore - Western Trunk**
CLIENT: Minto Communities Inc.
PROJECT #: 170401
BY: ATREL ENGINEERING LTD
DATE: March, 2017

STORM FREQUENCY: 5 & 10 YEAR
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 1

STREET NAMES	LOCATION FROM (Up)	LOCATION TO (Down)	0.20	0.30	0.50	0.55	0.59	0.60	0.65	0.65	0.66	0.70	0.70	0.75	0.76	0.80	RATIONAL METHOD INDIV. 2.78AR	RATIONAL METHOD ACCUM. 2.78AR	5 YEAR TIME CONC. (MIN)	5 YEAR RAINF. INTENS. (MM/HR)	5 YEAR FLOW (L/S)	Rational Method 10 year ACCUM 2.78AR (L/S)	10 year RAINF. INTENS. (MM/HR)	10 year FLOW (L/S)	ACTUAL PIPE FLOW (L/S)	PIPE TYPE	PIPE DIA. (NOM) (mm)	(ACT)	SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)	UpStream Obv. (M)	UpStream Inv. (M)	DwStream Obv. (M)	DwStream Inv. (M)
Jerome Jodoin	MH 237	MH 607		3.69		3.35	3.19				2.34	0.59	4.20		0.87		23.03	23.03	23.59	63.25	1456.95	8.29	73.99	613.37	2070.33	CONC	1800	1828.8	0.10	[illegible]	3792.13	45%	1.44	1.39	85.61	83.81	85.49	83.69
Jerome Jodoin	MH 607	MH 630										0.23					0.68	23.72	24.97	60.94	1445.26	8.29	71.28	590.91	2036.16	CONC	1800	1828.8	0.10	[illegible]	3792.13	46%	1.44	1.13	85.49	83.69	85.39	83.59
																			26.10																			
Aquarium Avenue	MH 6501	MH 6502							0.21								0.38	0.38	10.00	104.19	39.54		122.14		39.54	PVC	375	366.4	0.25	[illegible]	84.05	53%	0.80	1.48	86.02	85.65	85.84	85.47
Aquarium Avenue	MH 6502	MH 6503							0.19								0.34	0.72	11.43	97.19	70.25		113.90		70.25	CONC	450	457.2	0.20	72.0	133.02	47%	0.81	1.48	85.84	85.39	85.70	85.25
Aquarium Avenue	MH 6503	MH 6504																0.72	12.91	90.97	65.75		106.57		65.75	CONC	525	533.4	0.10	[illegible]	179.46	63%	0.80	0.24	85.70	85.18	85.68	85.16
Aquarium Avenue	MH 6504	MH 6510				0.31			0.27								0.96	1.68	13.15	90.05	151.71		105.48		151.71	CONC	600	609.6	0.15	68.0	248.09	39%	0.85	1.33	85.68	85.08	85.58	84.98
																			14.49																			
Stickleback Way	MH 6507	MH 6508							0.29								0.52	0.52	10.00	104.19	54.60		122.14		54.60	CONC	450	457.2	0.20	35.5	133.02	59%	0.81	0.73	85.80	85.35	85.73	85.28
Stickleback Way	MH 6508	MH 6509																0.52	10.73	100.49	52.66		117.78		52.66	CONC	450	457.2	0.20	11.0	133.02	60%	0.81	0.23	85.70	85.25	85.68	85.23
Stickleback Way	MH 6509	MH 6510				0.31			0.21								0.55	1.07	10.96	99.40	106.53		116.49		106.53	CONC	600	609.6	0.15	75.0	233.61	54%	0.80	1.56	85.68	85.08	85.58	84.98
																			12.52																			
Aquarium Avenue	MH 6510	MH 6511																2.76	14.49	86.26	236.01		99.85		235.01	CONC	825	838.2	0.10	63.0	473.55	50%	0.86	1.22	85.68	84.76	85.52	84.70
Aquarium Avenue	MH 6511	MH 6513							0.40								0.78	3.53	15.71	81.33	287.37		95.24		287.37	CONC	900	914.4	0.10	50.0	597.22	52%	0.91	0.92	85.52	84.62	85.47	84.57
																			16.63																			
Aquarium Avenue	MH 6512	MH 6513				0.50			0.34								1.50	1.50	10.00	104.19	156.41		122.14		156.41	CONC	600	609.6	0.10	99.0	233.61	33%	0.80	2.06	85.60	85.00	85.47	84.87
																			12.06																			
Shiner Lane	MH 6513	MH 630				0.65			0.19								1.33	6.37	16.83	78.65	500.92		92.08		500.92	CONC	1200	1219.2	0.10	72.5	1286.19	61%	1.10	1.11	85.47	84.27	85.40	84.20
																			17.74																			
Jerome Jodoin	MH 630	MH 631										0.20					0.58	30.67	26.10	59.20	1815.59	8.29	69.23	573.91	2389.50	CONC	1950	1981.2	0.10	69.0	4694.42	49%	1.52	0.76	85.40	83.45	85.33	83.38
Jerome Jodoin	MH 631	MH 631A										0.20					0.58	31.25	26.86	58.09	1815.46	8.29	67.93	563.14	2378.59	CONC	1950	1981.2	0.10	75.5	4694.42	49%	1.52	0.83	85.33	83.38	85.25	83.30
Jerome Jodoin	MH 631A	MH 658										0.22					0.43	31.68	27.68	56.93	1803.58	8.29	66.57	551.86	2355.44	CONC	1950	1981.2	0.10	105.5	4694.42	50%	1.52	1.15	85.25	83.30	85.14	83.19
																			28.83																			
Aquarium Avenue	MH 6550	MH 6551				0.21			0.20								0.86	0.86	10.00	104.19	89.94		122.14		89.94	CONC	525	533.4	0.15	74.5	179.46	50%	0.80	1.55	85.98	85.46	85.86	85.34
Aquarium Avenue	MH 6551	MH 6560				0.36			0.27								1.33	2.19	11.55	96.68	211.93		113.29		211.93	CONC	750	762.0	0.10	86.5	367.27	42%	0.81	1.79	85.86	85.11	85.77	85.02
																			13.34																			
Commercial	MH 6559	MH 6560														2.20	4.89	4.89	15.00	83.56	408.84		97.85		408.84	CONC	975	990.6	0.10	38.0	739.33	45%	0.96	0.66	85.81	84.84	85.77	84.80
																			15.66																			
Aquarium Avenue	MH 6560	MH 6570				0.30			0.28								0.67	7.75	15.66	81.49	631.75		95.41		631.75	CONC	1050	1066.8	0.10	50.0	900.87	30%	1.01	0.83	85.77	84.72	85.72	84.67
																			16.49																			
Stickleback Way	MH 6564	MH 6565							0.30								0.54	0.54	10.00	104.19	56.48		122.14		56.48	PVC	375	366.4	0.26	72.0	84.05	33%	0.80	1.51	86.03	85.66	85.84	85.47
Stickleback Way	MH 6565	MH 6566																0.54	11.51	96.86	52.51		113.51		52.51	CONC	450	457.2	0.20	12.0	133.02	61%	0.81	0.25	85.84	85.39	85.82	85.37
Stickleback Way	MH 6566	MH 6570							0.27								0.49	1.03	11.75	95.77	98.64		112.22		98.64	CONC	525	533.4	0.16	64.0	179.46	45%	0.80	1.33	85.82	85.30	85.72	85.20
																			13.08																			
Aquarium Avenue	MH 6570	MH 6571				0.40			0.24								1.05	9.83	16.49	79.04	776.86		92.54		776.86	CONC	1200	1219.2	0.10	71.0	1286.19	40%	1.10	1.07	85.72	84.52	85.65	84.45
Aquarium Avenue	MH 6571	MH 6572																9.83	17.56	76.10	747.96		89.09		747.96	CONC	1350	1371.6	0.10	13.0	1760.81	58%	1.19	0.19	85.65	84.30	85.64	84.29
Aquarium Avenue	MH 6572	MH 6573							0.55								1.01	10.84	17.75	75.61	819.66		88.51		819.66	CONC	1350	1371.6	0.10	120.0	1760.81	53%	1.19	1.68	85.61	84.26	85.49	84.14
Aquarium Avenue	MH 6573	MH 6574																10.84	19.43	71.53	776.43		83.72		775.43	CONC	1350	1371.6	0.10	14.0	1760.81	66%	1.19	0.20	85.46	84.11	85.46	84.10
Aquarium Avenue	MH 6574	MH 6575						0.24				0.25					0.89	11.73	19.62	71.09	833.70		83.19		833.70	CONC	1350	1371.6	0.10	34.0	1760.81	53%	1.19	0.48	85.42	84.07	85.39	84.04
Aquarium Avenue	MH 6575	MH 6580																11.73	20.10	70.03	821.27		81.96		821.27	CONC	1350	1371.6	0.10	28.0	1760.81	53%	1.19	0.39	85.39	84.04	85.36	84.01
																			20.49																			
Damselfish Walk	MH 6578	MH 6579						0.43				0.53					1.96	1.96	10.00	104.19	204.49		122.14		204.49	CONC	675	685.8	0.12	120.0	339.63	40%	0.92	2.18	85.69	85.02	85.51	84.84
Damselfish Walk	MH 6579	MH 6580										0.27					0.53	2.49	12.18	93.95	233.76		110.08		233.76	CONC	750	762.0	0.15	101.5	449.81	48%	0.99	1.72	85.51	84.76	85.36	84.61
																			13.89																			
Aquarium Avenue	MH 6580	MH 6581						0.35				0.78					0.93	15.15	20.49	69.19	1048.20		80.97		1048.20	CONC	1500	1524.0	0.10	72.5	2378.21	56%	1.30	0.93	85.36	83.86	85.28	83.78
Aquarium Avenue	MH 6581	MH 6615																15.15	21.42	67.29	1019.42		78.73		1019.42	CONC	1500	1524.0	0.10	19.0	2332.02	56%	1.28	0.25	85.26	83.76	85.23	83.73
																			21.67																			
Decoeur Drive	MH 6605	MH 6610						0.27				0.27					0.98	0.98	10.00	104.19	101.67		122.14		101.67	CONC	525	533.4	0.20	71.0	200.65	49%	0.90	1.32	85.62	85.10	85.48	84.96
																			11.32																			
Sculpin Street	MH 6608	MH 6609						0.37				0.25				1.96	5.46	5.46	15.00	83.56	456.46		97.85		456.46	CONC	975	990.6	0.10	115.5	739.33	38%	0.96	2.01	85.68	84.71	85.56	84.59
Sculpin Street	MH 6609	MH 6610										0.05					0.10	5.56	17.01	77.59	431.40		90.83		431.40	CONC	1050	1066.8	0.10	18.0	900.87	52%	1.01	0.30	85.58	84.51	85.54	84.49
																			17.30																			
Decoeur Drive	MH 6610	MH 6611										0.27					0.53	7.06	17.30	76.78	542.16		89.89		542.16	CONC	1050	1066.8	0.10	51.5	900.87	40%	1.01	0.85	85.48	84.43	85.43	84.38
Decoeur Drive	MH 6611	MH 6612						0.33				0.24					1.20	8.26	18.16	74.59	615.98		87.29		615.98	CONC	1200	1219.2	0.10	87.5	1286.19	52%	1.10	1.31	85.48	84.23	85.34	84.14
Decoeur Drive	MH 6612	MH 6615										0.44					0.86	9.12	19.46	71.45	651.31		83.62		651.31	CONC	1200	1219.2	0.10	102.5	1286.19	49%	1.10	1.64	85.34	84.14	85.23	84.03
																			21.11																			
Decoeur Drive	MH 6615	MH 658						0.33				0.32					1.10	26.36	21.67	66.80	1694.08		78.16		1694.08	CONC	1650	1676.4	0.15	50.0	3731.42	55%	1.69	0.61	85.23	83.58	85.13	83.48
																			22.28																			
Jerome Jodoin	MH 658	MH 659						0.15				0.23					0.83	57.87	28.83	55.39	3205.55	8.29	64.76	536.86	3742.41	CONC	2250	2286.0	0.10	82.5	6875.59	46%	1.68	0.82	85.13	82.88	85.05	82.80
Jerome Jodoin	MH 659	MH 683						0.20				0.44					1.32	59.20	29.65	54.35	3217.28	8.29	63.54	526.74	3744.03	CONC	2250	2286.0	0.10	77.0	6875.59	46%	1.68	0.77	85.05	82.80	84.97	82.72
																			30.42																			
Mer Bleue	MH Stub 2	MH 542	11.55	0.27						3.04				0.51			6.67	6.67	25.56	60.01	400.22	6.56	70.19	460.21	860.43	CONC	1050	1066.8	0.55	30.0	2073.95	59%	2.32	0.50	84.50	83.45	84.13	83.08
																			26.07																			
Gardenpost	MH 542	MH 543																6.67	26.07	59.25	395.15	6.56	69.29	454.31	849.46	CONC	1200	1219.2	0.15	11.5	1575.26	46%	1.35	0.14	84.22	83.02	84.20	83.00
Gardenpost	MH 543	MH 544										0.21					0.60	7.27	26.21	59.03	429.29	6.56	69.04	452.67	881.96	CONC	1200	1219.2	0.15	65.5	1575.26	44%	1.35	0.81	84.14	82.94	84.04	82.84
Gardenpost	MH 544	MH 550						0.24				0.30					1.18	8.45	27.02	57.88	488.99	6.56	67.86	443.62	932.61	CONC	1200	1219.2	0.15	85.5	1575.26	41%	1.35	1.06	84.04	82.84	83.91	82.71
Gardenpost	MH 550	MH 565						0.27				0.25					0.96	9.41	28.07	56.39	530.49	6.56	65.94	432.34	962.83	CONC	1500	1524.0	0.16	77.0	2856.14	66%	1.57	0.82	84.21	82.71	84.09	82.59
																			28.89																			
Gardenpost	MH 6625	MH 6627										0.19					0.37	0.37	10.00	104.19	38.52		122.14		38.52	CONC	450	457.2	0.20	34.5	133.02	71%	0.81	0.71	85.35	84.90	85.28	84.83
																			10.71																			
Site Plan	MH 6626	MH 6627														1.01	1.80	1.80	15.00	83.56	150.53		97.85		150.53	CONC	525	533.4	0.30	10.0	245.74	39%	1.10	0.15	85.16	84.64	85.13	84.61
																			15.15																			
Gardenpost	MH 6627	MH 6628																2.17	15.15	83.07	180.36		97.28		180.36	CONC	600	609.6	0.15	19.5	248.09	27%	0.85	0.38	85.13	84.53	85.10	84.50
Gardenpost	MH 6628	MH 6629																2.17	15.53	81.87	177.75		95.87		177.75	CONC	600	609.6	0.15	10.5	248.09	28%	0.85	0.21	85.07	84.47	85.05	84.45
Gardenpost	MH 6629	MH 6635						0.07									0.20	2.37	15.74	81.24	192.65		95.13		192.65	CONC	600	609.6	0.15	40.5	248.09	22%	0.85	0.79	85.02	84.42	84.96	84.36
																			16.53																			
Park	MH 6634	MH 6635		0.09													0.74	0.74	15.00	83.56	62.02		97.85		62.02	PVC	375	366.4	0.26	11.0	84.05	26%	0.80	0.23	84.99	84.62	84.96	84.59
																			15.23																			
Gardenpost	MH 6635	MH 6636						0.73				0.49					1.42	4.53	16.53	76.91	357.79		92.39		357.79	CONC	900	914.4	0.10	115.0	597.22	40%	0.91	2.11	84.96	84.06	84.84	83.94
Gardenpost	MH 6636	MH 6640										0.27					0.53	5.06	18.64	73.38	371.27		86.89		371.27	CONC	900	914.4	0.10	72.5	597.22	38%	0.91	1.44	84.84	83.94	84.76	83.86
																			20.08																			
Guppy Grove	MH 6639	MH 6640						0.28				0.17					0.76	0.76	10.00	104.19	79.66		122.14		79.66	CONC	450	457.2	0.20	63.0	133.02	40%	0.81	1.30	84.44	83.99	84.31	83.86
																			11.30																			
Guppy Grove	MH 6640	MH 565						0.29				0.23					0.93	6.76	20.08	70.08	473.42		82.00		473.42	CONC	1050	1066.8	0.10	74.0	900.87	47%	1.01	1.22	84.31	83.26	84.24	83.19
																			21.30																			
Gardenpost	MH 565	MH 683										0.12					0.35	16.51	28.89	55.32	913.61	6.56	64.67	424.02	1337.63	CONC	1650	1676.4	0.15	72.0	3882.64	64%	1.67	0.72	84.24	82.59	84.13	82.48
																			29.62																			
Jerome Jodoin	MH 683	MH 690		0.51								0.19					0.88	76.59	30.42	53.42	4091.30	14.85	62.45	927.17	5018.46	CONC	2550	2590.8	0.10	45.0	9599.83	48%	1.82	0.41	84.97	82.42	84.92	82.37
Unopen Road allowance	MH 690	MH 691																76.59	30.83	52.94	4054.53	14.85	61.88	918.71	4973.24	CONC	2550	2590.8	0.10	58.5	9599.83	48%	1.82	0.54	84.87	82.32	84.81	82.26
Unopen Road allowance	MH 691	MH 691A		0.21													0.18	76.76	31.37	52.32	4016.21	14.85	61.16	908.02	4924.23	CONC	2550	2590.8	0.10	120.0	9599.83	49%	1.82	1.10	84.81	82.26	84.69	82.14
Unopen Road allowance	MH 691A	MH 691B		0.16													0.13	76.90	32.47	51.10	3929.38	14.85	59.73	886.79	4816.17	CONC	2550	2590.8	0.10	49.5	9599.83	50%	1.82	0.45	84.64	82.09	84.59	82.04
																			32.92																			
Mattamy	MH 99	MH 691B									30.30						37.50	37.50	22.51	65.18	2444.47		76.26		2444.47	CONC	1950	1981.2	0.12	80.0	5142.48	52%	1.67	0.80	84.71	82.76	84.61	82.66
																			23.31																			
Unopen Road allowance	MH 691B	MH W-FS		0.19								0.04					0.19	114.59	32.92	50.62	5800.74	14.85	59.16	878.32	6679.06	CONC	3000	SAME	0.10	45.5	15688.99	57%	1.94	0.43	84.61	81.91	84.56	81.86
																			20.04																			

Proposed storm sewers
Existing storm sewers

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha) 2 YEAR				AREA (Ha) 5 YEAR				AREA (Ha) 10 YEAR				AREA (Ha) 100 YEAR				FLOW						SEWER DATA							
			AREA		Indiv.	Accum.	AREA		Indiv.	Accum.	AREA		Indiv.	Accum.	AREA		Indiv.	Accum.	Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
Location	From Node	To Node	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW(min	Q/Q full
ave Broadcast Avenue																																
	7	8	0.36	0.73	0.74	0.74			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	57	450	450	CONC	0.20	88.5	127.5033	0.8017	1.8399	0.444
To voie Ryan Reynolds Way, Pipe 8 - 6						0.74				0.00				0.00				0.00	11.84														
BLOCK 27																																
	100	2			0.00	0.00	0.68	0.80	1.51	1.51			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	158	525	525	CONC	0.25	14.5	215.0311	0.9933	0.2433	0.733
To voie Ryan Reynolds Way, Pipe 2 - 3						0.00				1.51				0.00				0.00	10.24														
BLOCK 28																																
Contribution From voie Ryan Reynolds Way, Pipe 4 - 6						2.22				1.51				0.00				0.00	12.74														
Contribution From voie Ryan Reynolds Way, Pipe 8 - 6						0.74				0.00				0.00				0.00	12.09														
	6	6559			0.00	2.96			0.00	1.51			0.00	0.00			0.00	0.00	12.74	67.67	91.64	0.00	156.85	339	750	750	CONC	0.15	29.0	431.1703	0.9760	0.4952	0.786
voie Ryan Reynolds Way																																
	5	4	0.53	0.71	1.04	1.04			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	80	450	450	CONC	0.20	84.0	127.5033	0.8017	1.7463	0.628
			0.17	0.66	0.30	0.30			0.00	0.00			0.00	0.00			0.00	0.00															
	9	10	0.21	0.57	0.33	0.64			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	49	450	450	CONC	0.25	56.0	142.5531	0.8963	1.0413	0.343
Contribution From ave Broadcast Avenue, Pipe 7 - 8						0.74				0.00				0.00				0.00	11.84														
	8	6			0.00	0.74			0.00	0.00			0.00	0.00			0.00	0.00	11.84	70.40	95.38	0.00	163.32	52	600	600	CONC	0.15	12.5	237.8056	0.8411	0.2477	0.218
To BLOCK 28, Pipe 6 - 6559						0.74				0.00				0.00				0.00	12.09														
	15	16	0.27	0.65	0.50	0.50			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	38	375	375	PVC	0.30	33.5	96.0323	0.8695	0.6421	0.396
	16	17			0.00	0.50			0.00	0.00			0.00	0.00			0.00	0.00	10.64	74.42	100.92	0.00	172.89	37	375	375	PVC	0.30	10.0	96.0323	0.8695	0.1917	0.384
	17	14	0.18	0.67	0.33	0.82			0.00	0.00			0.00	0.00			0.00	0.00	10.83	73.75	99.99	0.00	171.28	61	450	450	CONC	0.20	52.5	127.5033	0.8017	1.0914	0.477
To SCULPIN STREET, Pipe 14 - 6608						0.82				0.00				0.00				0.00	11.93														
			0.07	0.72	0.15	0.15			0.00	0.00			0.00	0.00			0.00	0.00															
	1	2	0.09	0.56	0.15	0.29			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	22	375	375	PVC	0.30	72.0	96.0323	0.8695	1.3801	0.234
Contribution From BLOCK 27, Pipe 100 - 2						0.00				1.51				0.00				0.00	10.24														
	2	3			0.00	0.29			0.00	1.51			0.00	0.00			0.00	0.00	11.38	71.88	97.43	0.00	166.86	168	600	600	CONC	0.15	13.0	237.8056	0.8411	0.2576	0.708
			0.12	0.43	0.14	0.43			0.00	1.51			0.00	0.00			0.00	0.00															
	3	4	0.26	0.67	0.49	0.92			0.00	1.51			0.00	0.00			0.00	0.00	11.64	71.04	96.27	0.00	164.86	211	675	675	CONC	0.15	33.0	325.5584	0.9098	0.6045	0.648
			0.03	0.59	0.05	2.01			0.00	1.51			0.00	0.00			0.00	0.00															
	4	6	0.13	0.57	0.21	2.22			0.00	1.51			0.00	0.00			0.00	0.00	12.24	69.15	93.67	0.00	160.37	296	675	675	CONC	0.20	31.5	375.9224	1.0505	0.4998	0.785
To BLOCK 28, Pipe 6 - 6559						2.22				1.51				0.00				0.00	12.74														
	11	10	0.18	0.71	0.35	0.35			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	27	375	375	PVC	0.30	86.5	96.0323	0.8695	1.6581	0.281
			0.11	0.57	0.18	1.16			0.00	0.00			0.00	0.00			0.00	0.00															
			0.16	0.58	0.26	1.43			0.00	0.00			0.00	0.00			0.00	0.00															
	10	12	0.18	0.65	0.32	1.74			0.00	0.00			0.00	0.00			0.00	0.00	11.66	70.98	96.18	0.00	164.70	124	525	525	CONC	0.20	46.5	192.3297	0.8885	0.8723	0.643
	12	13			0.00	1.74			0.00	0.00			0.00	0.00			0.00	0.00	12.53	68.29	92.49	0.00	158.32	119	525	525	CONC	0.20	11.0	192.3297	0.8885	0.2063	0.618
	13	14	0.05	0.69	0.10	1.84			0.00	0.00			0.00	0.00			0.00	0.00	12.74	67.68	91.66	0.00	156.89	125	525	525	CONC	0.20	21.5	192.3297	0.8885	0.4033	0.648
To SCULPIN STREET, Pipe 14 - 6608						1.84				0.00				0.00				0.00	13.14														
SCULPIN STREET																																
Contribution From voie Ryan Reynolds Way, Pipe 13 - 14						1.84				0.00				0.00				0.00	13.14														
Contribution From voie Ryan Reynolds Way, Pipe 17 - 14						0.82				0.00				0.00				0.00	11.93														
			0.03	0.54	0.04	2.71			0.00	0.00			0.00	0.00			0.00	0.00															
	14	6608	0.13	0.41	0.15	2.85			0.00	0.00			0.00	0.00			0.00	0.00	13.14	66.54	90.09	0.00	154.18	190	675	675	CONC	0.15	29.0	325.5584	0.9098	0.5313	0.583

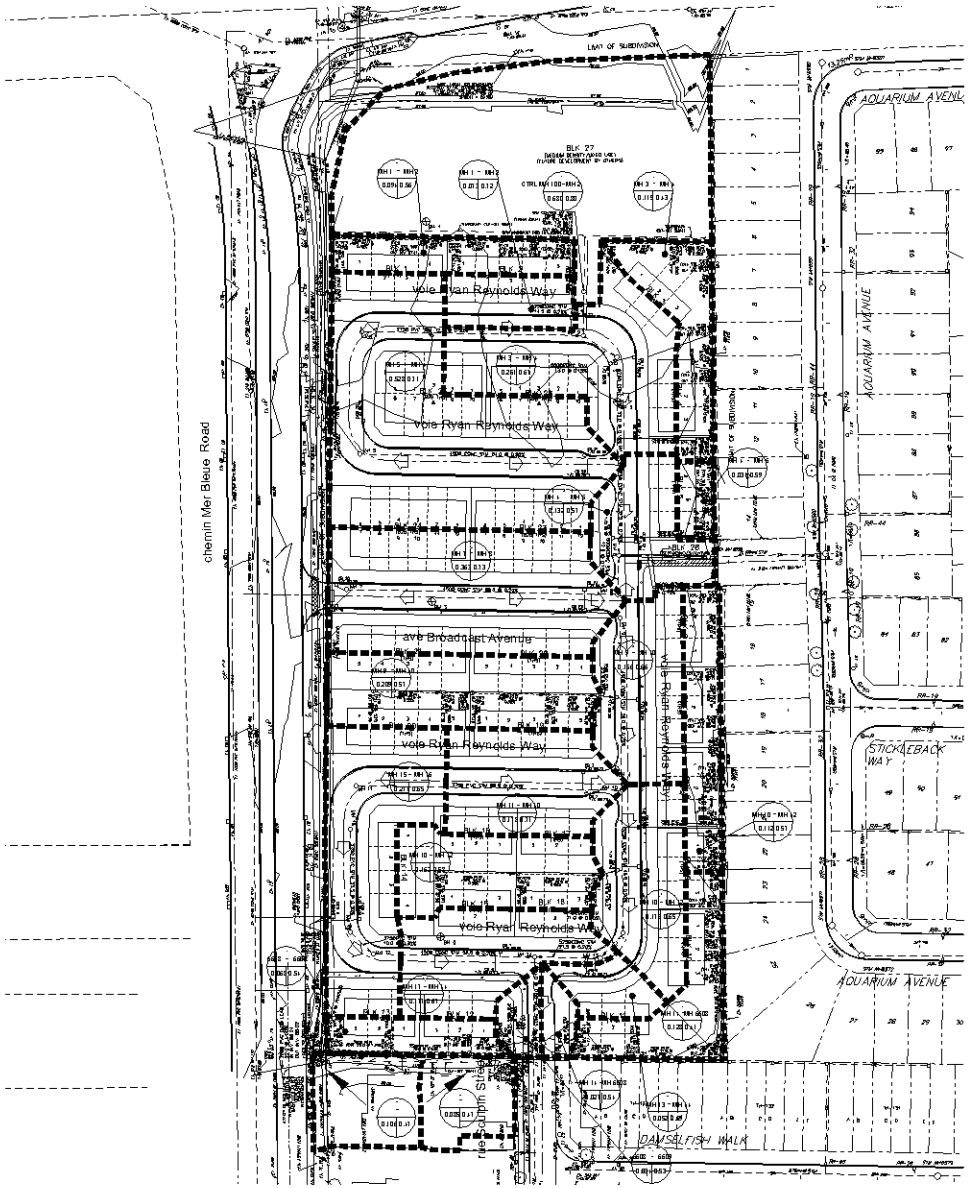
Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

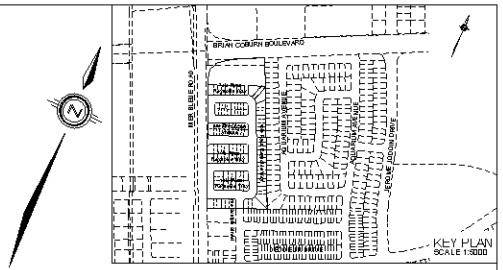
Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

LICENSED PROFESSIONAL ENGINEER s.21 PROVINCE OF ONTARIO

Designed: A.K.	PROJECT: CASSETTE SUBDIVISION (2275 MER BLEUE ROAD)		
Checked: W.L.	LOCATION: City of Ottawa		
Dwg Reference: Storm Drainage Plan Dwg. 19	File Ref: 20-1214	Date: Jun 2022	Sheet No. SHEET 1 OF 1

1214_STM_DesSheet2.xlsx





LEGEND

STORM DRAINAGE BOUNDARY
SUB-DRAINAGE BOUNDARY
STORM DRAINAGE BOUNDARY (OTHER PHASES)
STORM FREQUENCY
UPSTREAM MH TO DOWNSTREAM MH
AREA IN HECTARES
RUNOFF COEFFICIENT
EXTERNAL 2.78AC = 2.78AC=14.40
EXTERNAL TIME OF CONCENTRATION TC=14.5MIN
EXTERNAL BLENDED RUNOFF COEFFICIENT C= 0.70
EXTERNAL STORM FREQUENCY 2YR
UPSTREAM MH TO DOWNSTREAM MH
AREA IN OTHER PHASES IN HECTARES
RUNOFF COEFFICIENT
STREET CATCHBASIN & LEAD
STREET CATCHBASIN WITH CLOSED LID & LEAD MAINTENANCE HOLE
CURB INLET CATCHBASIN & LEAD CATCHBASIN/ MAINTENANCE HOLE
INTERCONNECTED CATCH BASIN & LEADS
CAP
OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
EXISTING STORM MAINTENANCE HOLE

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES. PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CANADA GEODETIC DATUM (ADV JOB NO. 18048-19) APPENDED AT THE EASTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 99.26m ON THE TOP OF SPINDLE ELEVATED = 99.260m

No	BY	DATE	DESCRIPTION
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-06	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

s.21

STORM DRAINAGE PLAN

DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel: (613) 836-0856
Fax: (613) 836-7183
www.dsel.ca

DRAWN BY: A.K./V.R.	CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: C.M.	19
SCALE: 1:500	DATE: DECEMBER 2021	

CITY PLAN No. 18616

CITY FILE No. D07-16-21-0001

000157

Stormwater Management Report for Cassette Subdivision 2275 Mer-Bleue Road

City of Ottawa

May 2022

Updated June 2022

Prepared for: David Schaeffer Engineering Ltd.

Prepared by: JFSA Water Resources and Environmental Consultants

JFSA Ref. No.: 2321-22

J. F. Sabourin and Associates Inc.
www.jfsa.com

000159

JFSA Water Resources and Environmental Consultants

J.F. Sabourin and Associates Inc.
52 Springbrook Drive, Ottawa, ON K2S 1B9
tel.: 613.836.3884, fax: 613.836.0332, www.jfsa.com

Stormwater Management Report for Cassette Subdivision 2275 Mer-Bleue Road

in the City of Ottawa

May 2022
Updated June 2022

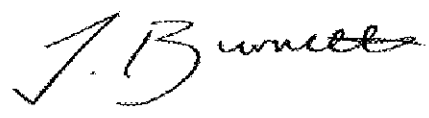
Prepared for:

David Schaeffer Engineering Ltd.

June 2022 report updated by

Paulo Pickart, P.Eng.

Reviewed by :



Jonathon Burnett, B.Eng., P.Eng.

JFSA Ref. No.: 2321-22

000160

Stormwater Management Report
for Cassette Subdivision
2275 Mer-Bleue Road
in the City of Ottawa

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

MODELLING FILES

Background: Rationale for Report Update

This report is an update of the May 2022 "Stormwater Management Report for Cassette Subdivision 2275 Mer-Bleue Road". The update provides additional clarification to the text of the report and modelling updates based on comments provided by the City of Ottawa Reviewers received in June 2022. Review comments mostly pertain to the representation of the CB grates in the model, the addition of closed CBs for several rear yard locations and general further clarification regarding the modelling results and SWM report text.

Stormwater Management Report for Cassette Subdivision 2275 Mer-Bleue Road

in the City of Ottawa
May 2022

1 INTRODUCTION AND OBJECTIVES

J.F. Sabourin and Associates Inc. (JFSA) were retained by David Schaeffer Engineering Ltd. (DSEL) to prepare a Stormwater Management (SWM) Plan for the Cassette Subdivision, located off 2275 Mer-Bleue Road, Orleans, within the City of Ottawa. As shown by the image provided on the cover page, the future development is located west of Mer-Bleue Road, south of Brian Coburn Boulevard and west of Minto's Avalon Encore - Stage 6 development. The proposed development will outlet to the Avalon West (neighbourhood 5) SWM facility, before ultimately discharging to McKinnon's Creek.

The development will have a total drainage area of 4.04 ha, consisting of 3.36 ha of residential units and a 0.68 ha mix-use block. Figure 1 provides an overview of the location of these respective blocks within the subdivision. The subject site is tributary to the existing Avalon West (N5) SWM Facility, south of Avalon Encore Stage 5, which will provide both the quantity and quality control for the subject site before discharging to McKinnon's Creek to the south. To ensure that the proposed development does not adversely affect the existing downstream developments and associated SWM pond operations, peak flows from the subject site have been limited to 220 L/s/ha as per the Draft Plan of Subdivision, FSR and Avalon Encore Stage 6 Design Brief.

The purpose of this report is to evaluate the major and minor system flows of the proposed Cassette residential development with respect to City of Ottawa stormwater management guidelines and to check the adequacy of the proposed pipe sizes to convey the assigned unitary release rate of 220 L/s/ha and ensure the safe conveyance of the 100-year storm flows from within the development. The following background documents were reviewed in preparing this report:

- *Stormwater Management Planning and Design Manual,* Ministry of the Environment, March 2003.
- *Erosion and Sediment Control Guidelines for Urban Construction,* Conservation Halton et al., December 2006.
- *City of Ottawa Sewer Design Guidelines,* City of Ottawa, October 2012.
- *Technical Bulletin ISDTB-2014-01, Revisions to Ottawa Design Guidelines – Sewer,* City of Ottawa, February 2014.
- *City of Ottawa Technical Bulletin PIEDTB-2016-01*, City of Ottawa, September 2016.
- *City of Ottawa Technical Bulletin ISTB-2018-04*, City of Ottawa, June 2018.

- *Avalon Encore Stage 6, Stormwater Management and Site Servicing Design, Brief Atrel Engineering, March 2018.*
- *Design Brief for Interim Expansion of the Avalon West Stormwater Management Pond for the Summerside South Phase 1 Subdivision DSEL & JFSA, June 2019.*
- *Functional Servicing Report For 2275 Mer Bleue Road – Caivan Communities, JFSA, June 2021.*
- *Design Report And Stormwater Management Brief - Caivan Cassette Subdivision (2275 Mer Bleue Road) Urbantech, December 2021.*
- *2275 Mer Bleue Road / Preliminary Stormwater Management Design, JFSA March 2021*

As per the approach formalized in the September 2016 *City of Ottawa Technical Bulletin PIEDTB-2016-01*, the proposed subdivision has been designed with a 2-year minor system level of service, while ensuring the specified unitary release rate (220L/s/ha) is not exceeded. Where possible with grading and minor system capture limitations, road ponding areas up to 35 cm deep were used to contain the 100-year major system flows.

The PCSWMM computer program has been used to model the major and minor systems, to ensure that all stormwater management requirements are satisfied. The general SWM design criteria and guidelines that are to be met are described in Section 2.

Legend

— Site Plan

Land Use

Mixed Use

Residential

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.

DSEL
david schaeffer engineering ltd

Mer Bleue Subdivision

Figure 1: Site Overview

PROJECT	2321
DRAWN	MP
DATE	MAY 2022

C:\OneDrive\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER Documents\PROJ\2321 22\202204 Subm 1\Design\GIS\20220429 Report Figures

2 DESIGN CRITERIA AND GUIDELINES

The design criteria and guidelines used for the stormwater management of the subject subdivision are those that were developed in the background documents, as well as those provided in the October 2012 *City of Ottawa Sewer Design Guidelines* and subsequent technical memorandums, and generally accepted stormwater management design guidelines.

The detailed design of the proposed Cassette development has a total drainage area of 4.04 ha with an average imperviousness of 66%. A detailed analysis of the proposed dual drainage system was required to confirm that the following general design criteria and guidelines for the minor and major systems would be met.

2.1 Minor System

a) Storm sewers are to be designed to provide a minimum 2-year level of service, while not exceeding the specified unitary release rate (220L/s/ha).

b) The 100-year hydraulic grade line (HGL) within the development's minor systems must be maintained at least 0.3 m below the underside of footing elevation where gravity house connections are installed.

c) For less frequent storms (i.e. larger than 1:2 year or 1:5 year on collector / 1:10 year on arterial roads), the minor system shall, if required, be limited with the use of inlet control devices to prevent excessive hydraulic surcharges and to maximize the use of surface storage on the road where desired.

d) Catch basins on the road are to be equipped with City standard type S19 (fish) grates or City standard type S22 side inlets, and grates for catch basins in rear yards, parks and open spaces with pedestrian traffic are to be City standard type S19, S30 and S31.

e) Both Single and double catch basins are to be equipped with 200 mm minimum lead pipes.

f) Rearyard catch basins are to be equipped with 250 mm minimum lead pipes. Catch basins installed on the street, where rearyard catch basins connect to the main storm sewer through the catch basin, are to be equipped with 250 mm minimum lead pipes for both single and double catchbasins.

g) Under full flow conditions, the allowable velocity in storm sewers is to be no less than 0.80 m/s and no greater than 3.0 m/s. Where velocities over 3.0 m/s are proposed, provisions shall be made to protect against displacement of sewers by sudden jarring or movement. Velocities greater than 6 m/s are not permitted.

2.2 Major System

a) The major system shall be designed with enough road surface storage to allow the excess runoff of a 100-year storm to be retained within road ponding areas where desired.

b) Inlet control devices should be sized such that they do not create surface ponding on the road during the 2-year design storm; it should be noted that surface ponding over grates is present during rainfall under any design, as an appropriate depth of water is required for runoff to enter the grate, although for these smaller events the ICDs have been appropriately sized to ensure that they are not acting as a restriction to the flow entering the minor system.

c) Roof leaders shall be installed to direct the runoff to splash pads and onto grassed areas.

d) For the 100-year storm, the maximum total depth of water (static + dynamic) on all roads shall not exceed 35 cm at the gutter.

e) During the 100-year + 20% stress test, the maximum extent of surface water on streets, rearyards, public spaces and parking areas shall not touch the building envelope.

f) When catch basins are installed in rear yards, safe overland flow routes are to be provided to allow the release of excess flows from such areas.

g) The product of the maximum flow depths on streets and maximum flow velocity must be less than 0.60 m^2/s on all roads.

h) For the majority of the developments, the excess major system flows up to the 100-year return period are to be retained on-site in development blocks such as parks, schools, and commercial, unless specified otherwise.

i) There must be at least 15 cm of vertical clearance between the spill elevation on the street and the ground elevation at the nearest building envelope that is in the proximity of the flow route or ponding area.

j) There must be at least 30 cm of vertical clearance between the rear yard spill elevation and the ground elevation at the adjacent building envelope.

3 ASSUMPTIONS AND SOURCE OF DATA USED IN THIS STUDY

Sources of information and assumptions made in this study are listed below:

- Stormwater management model: *PCSWMM (SWMM5 Engine 5.1.015)*
- Minor system design: *1:2 year, plus 1:5-year inflows on collector roads and 1:10 year on arterial roads. See the Rational Method Calculations in Appendix A.*
- Major system design: *1:100 year*
- Max. 100-yr water depth on roads: *35 cm above the gutter*
- Extent of the major system: *Shall not touch the building envelope during the 100-year + 20% stress test*
- PCSWMM model parameters: *Fo = 76.2 mm/hr, Fc = 13.2 mm/hr, DCAY = 4.14/hr, D.Stor.Imp. = 1.57 mm, D.Stor.Per. = 4.67 mm (as per 2012 City of Ottawa Sewer Design Guidelines)*
  Detailed Area Imperviousness: maximum allowable zoning. Lumped Area Imperviousness: based on runoff coefficient (C) where C = 0.7 x imperviousness ratio+ 0.2.
- Design storms: *2-, 5-, 10-, and 100-year 3-hour Chicago and the 100-year 24-hour SCS Type II storms as per 2012 City of Ottawa Sewer Design Guidelines; peak averaged over 10 minutes.*
- Historical Events: *July 1st, 1979; August 4th, 1988; and August 8th, 1996, events as per 2012 City of Ottawa Sewer Design Guidelines.*
- Stress Test: *20% increase in the 100-year 3-hour Chicago storm.*
- Street catch basin covers: *City Standard Type S19 (fish) or City Standard Type S22 (side inlet). Approach flow-capture curves as per PCSWMM Curves provided by the City of Ottawa.*
- Rear yard catch basin covers: *City Standard Type S19, S30 and S31*
- Curb and gutter: *City Standard SC1.3 (mountable) and SC1.1 (barrier). In the absence of flow capture curves for these curbs and gutters, OPSD 600.010 curb and gutters are assumed.*
- Manning's' roughness coeff.: *0.013 for concrete and PVC pipes (free flow).*
- Minor system losses: *Refer to Appendix C for maintenance hole loss coefficients.*
- Underside of footing elevations: *As provided by DSEL.*
- Freeboard in HGL analysis: *0.3 m between the underside of footing elevation and 100-year hydraulic gradeline.*
- Inlet Control Devices: *Refer to Appendix B for Plas-Tech ICD details.*
- Depth of backyard swales: *As per DSEL's Grading Plan*
- Street and pipe dimensions: *As per DSEL's Plan and Profiles*
- Right-of-way characteristics: *As per DSEL's Details of Roads*
- Downstream HGL: 100-year HGL at existing MH 6608 and MH 6559 as modelled in the June 2019 SWM Report for Summerside South Phase 1, for which detailed modelling of the Avalon West subdivision was incorporated into the overall model by IBI Group on Sept. 6, 2018, or as per March 13, 2018,

Avalon West Stage 6 Major System Stormwater Analysis memo by IBI Group, whichever is higher. For this analysis:
MH-6559 - 100 Year HGL = 85.47m,
MH-6608 – 100 Year = 85.48m.

4 PROPOSED MINOR AND MAJOR SYSTEM DRAINAGE

The proposed minor and major system drainage routes are shown in plan view in Figures 2 and 3. As per City standards, the minor system has been designed to accommodate a minimum of the 2-year post-development flows from within the site and local roads, plus 5-year inflows on collector roads and 10-year inflows on arterial roads. A Rational Method design was conducted by DSEL (refer to Appendix A) to estimate minor system flows based on the City of Ottawa IDF relationship and selected runoff coefficients.

The minor system release rates from the 0.68 ha mix-use block were assumed to be limited to 220 L/s/ha (149.6 L/s) capture to the minor system with onsite storage provided up to the 100-year event. These model simulations indicate that approximately 56 m^3 of onsite storage will be required to contain the 100-year event onsite. Note that this storage volume has been approximately calculated and has simply been provided in this report to give an approximate order of magnitude with regards to the required storage volume. The exact volume required for the site and how that volume will be achieved should be assessed in more detail through a Site Plan Application.

Where possible with grading limitations, road ponding areas up to 35 cm deep were used to contain the 100-year major system flows in the development. Note that rear yard catch basins are connected to catch basins on the road where possible, to allow rear yard runoff access to the storage in road ponding areas at regular intervals while also preventing runoff from these rear yards from leaving the site. In a design of this type where lots are serviced by gravity house connections, inlet control devices (ICDs) can be used to limit minor system capture at each catch basin to the appropriate level of service. Minimum ICD sizes have been determined based on the rational method calculations, see Appendix D Table D1 and D5, with ICD sizes increased only if the detailed modelling determines it to be applicable (e.g. ponding depths exceeding 0.35m or to minimize major system runoff during extreme events).

Within the development, circular orifice plate type Inlet Control Devices (ICDs) of City standard diameters of 83 mm, 94 mm, 102 mm, 108 mm, 127 mm, 152 mm and 178 mm will be used to limit minor system capture to a minimum of the 2-year flow (refer to Appendix B for Plas-Tech ICD details), allowing for sub-surface storage of 0.5 m^3 in single catch basins, 1.0 m^3 in double catch basins, and 1.9 m^3 in catch basin manholes. Note that this subsurface catch basin storage has not been included in the modelling to be conservative.

To best represent the connection between the minor and major systems, each grate and ICD/lead pipe of the catch basins has been explicitly represented in the model. Each CB in the model has been represented as a node, with the hydraulic operations of each CB grate represented by

PCSWMM catchbasin approach flow-capture curves provided by the City of Ottawa depending on the implementation of the conventional CB or Curb Inlet CB (see Appendix D, Tables D-4B to D-4H). ICDs have been represented as vertical orifices with the respective ICD size, where no ICD is required the proposed lead pipe has been represented in the model as a short tube orifice (C_o=0.82) with the corresponding pipe diameter applied. When CBs also have flow contributions from rear yards, flows from the rear yards are placed directly to the CB node, while flows from the road are placed on the road which ensures that these flows first have to pass through the CB grate before entering the CB. This configuration allows the model to independently determine if at any given instant during a simulation whether the grate or ICD/lead pipe is controlling flow.

The street segments within the proposed development have been designed using a 'saw tooth' or 'sagged' road profile. The runoff from within these segments will be conveyed to catch basins located at the lowest point within the street segment. Flows more than the catch basin capture rate will be temporarily stored within the 'sagged' street segments and released slowly to the storm sewers, up to the 100-year design storm. When the storage on a specific street segment is surpassed due to blockage or an event greater than the 100-year storm, the excess water will flow towards the next downstream street sag, and eventually to the pond. It should be noted that the major system would outlet during the 100-year + 20% stress test without flooding any of the properties within the subdivision.

If the drainage system's capacity to capture surface flows is exceeded, Figure 5 presents the maximum extent of static surface ponding and volume on the streets based on grading. Additionally, surface storage volumes that may exist in the rear yards have not been considered in this model. This has been completed to ensure that the peak flows and ponding volumes calculated in the model are conservative.

The PCSWMM modelling, discussed in Sections 4.1 and 4.2, has demonstrated that the proposed drainage system for the subdivision will have sufficient capacity to control the excess flow during a 100-year storm and safely capture and convey the 2-year (plus 5-year on collector roads and 10-year on arterial roads) flow to the pond, without exceeding the specified unitary release rate. Note that all values presented in this SWM report are based on the reported maximum value (1-minute intervals) and not the maximum simulated value (0.5-second intervals).

4.1 Major System Analysis

The PCSWMM model was developed based on the information provided in Figures 2 and 3. Eight (8) simulations were conducted, one for each of the following rainfall events:

i) the 2-year, 3-hour Chicago storm;
ii) the 5-year, 3-hour Chicago storm;
iii) the 10-year, 3-hour Chicago storm;
iv) the 100-year, 3-hour Chicago storm;
v) the 100-year, 24-hour SCS Type II storm
vi) the July 1st, 1979 historical event;
vii) the August 4th, 1988 historical event;
viii) the August 8th, 1996 historical event; and
ix) the 100-year, 3-hour Chicago storm + 20%.

Note that the purpose of simulating the 100-year, 3-hour Chicago storm with a 20% increase is to stress test the drainage system for potential flooding, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. The depression storage and infiltration parameters in both the PCSWMM and SWMHYMO models are as per the October 2012 *City of Ottawa Sewer Design Guidelines*. The percent imperviousness of the detailed drainage areas has been established based on the maximum allowable impervious area for each of the respective zoning requirements The percent imperviousness of undetailed (lumped/external) drainage areas were calculated based on the runoff coefficient (C), where C = 0.7 x imperviousness ratio + 0.2. Figure 6 provides an overview of the subcatchments and the assumed impervious area, and Table D-2 provides a full summary of all subcatchment parameters modelled in PCSWMM.

As mentioned above, rational method calculations have been completed to determine the peak flows to each of the CBs within the development based on the required level of service (2/5/10-Year), see Table D5 in Appendix D for the full comparison between the rational method flows and those simulated in PCSWMM, and the respective ICD applied. Note that it is seen that the applied ICD size is either equal to or larger than that determined to convey the rational method flow. It is important to note that the rational method calculations assume 100% capture at each CB, which is true for CBs at low points but not always the case for CBs on a slope. Even in light of the expected differences due to assumptions and approach from this analysis it was found that the average difference between the rational method and simulated flows was only 0.5 L/s, with the main difference coming from the CBs with larger drainage areas where the Time of Concentration (T_c) may be greater than 10 minutes, as assumed in the rational method calculations.

Where required inflows are limited by circular orifice plate type Inlet Control Devices (ICDs) of City standard diameters 83 mm, 94 mm, 102 mm, 108 mm, 127 mm, 152 mm and 178 mm. Refer to Figure 2 for the proposed ICD sizes throughout the development. Note that 200 mm diameter lead pipes were assumed and are required between single catch basins and the storm sewers, and 250 mm diameter lead pipes were assumed and are required between rear yard catch basins or single catch basin manholes and the storm sewers.

Within the proposed subdivision, the dynamic flow depth on the road (at the gutter) will be minimal during the 100-year Chicago storm, as the 100-year flows are mostly retained within the road ponding areas and do not accumulate as in a typical subdivision design. Furthermore, it was determined that for the 100-year storm at all major system segments, the product of the depth of water (m) at the gutter multiplied by the velocity of flow (m/s) will not exceed the maximum allowable 0.6 m^2/s (refer to Table D-7 of Appendix D, where the calculated maximum was determined to be 0.06 m^2/s).

Details of the 100-year street maximum water depth and water surface elevations are provided in Table D-6 of Appendix D. Based on DSEL's grading the major system has approximately 197.5 m^3 of storage at these localized low points throughout the development. Depths calculated by the PCSWMM model demonstrate that a total 100-year depth of water (static and dynamic) on the street at these ponding areas will not exceed the maximum depth of 35 cm and that the maximum ponding depth throughout the subdivision for this event is 26 cm.

Table D-6 of Appendix D also presents the street storage stress test results based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. As shown in Table D-6, the maximum depth of water (static + dynamic overflow) at any ponding area under these conditions is calculated as 30 cm. The maximum extent of surface water during the 100-year + 20% stress test will not touch the building envelopes, refer to DSEL drawings for the build envelope elevations.

Within the development, there are 3 major system outflow locations from the development, one west along Broadcast Avenue to Mer-Bleue Road, one to the south via Sculpin Street and one east to the neighbouring Avalon Encore development via an open walkway block. Table 1A below outlines the peak flows and total runoff volumes from the development to these neighbouring properties for both the 100-Year 3hour Chicago and 24-hour SCS storms.

Table 1A: Major System Flow from the Cassette Development

Event	Location	Peak Major System Flow Offsite (m^3/s)	Total Major System Flow Volume Offsite (m^3)	Site Total Runoff Volume (m^3)	% of total Runoff Spilling from Development
100 Year CHI 3Hr	To Avalon Encore (East)	0.016	9.8		0.4%
	To Mer-Bleue Road (West)	0.008	5.7	2239	0.3%
	To Sculpin Street (South)	0.031	38.3		1.7%
	Total	0.055	53.8	2239	2.4%
100 Year SCS 24 Hr	To Avalon Encore (East)	0.013	7.7		0.3%
	To Mer-Bleue Road (West	0.005	5.5	3007	0.2%
	To Sculpin Street (South)	0.024	26.0		0.9%
	Total	0.042	39.2	3007	1.3%

From Table 1A above it is seen that for the 100-Year event 1.3%-2.4% of the total runoff from the development will spill to neighbouring developments, this equates to a total runoff volume of 53.8 m^3 and 39.2 m^3 for the 100-year Chicago and SCS storms respectively, which is mostly a product from local drainage that can not be contained within the development due to grading constraints (e.g. connecting the proposed development roads with existing neighbouring roads). Note that based on DSELs detailed grading plan there is 37$m^3$of static storage available in the rear yards that have not been included in the modelling (as per City guidelines), as such it is reasonable to conclude the major system runoff volumes presented above are a conservative approximation during these extreme events.

Table 1B below presents a summary of the major system ponding depth and the ponding duration for both the 100-year 3 Hour Chicago storm and 100-Year 24Hr SCS storm. Note that the ponding duration has been calculated as the duration of time throughout the simulation (3 or 24 hours) in which the ponding depth at the CB grate is greater than 1 cm. Based on this analysis it was found that for the 100-Year 3 Hour Chicago event, the maximum ponding depth is 26 cm and the maximum ponding duration is 2 hours and 44 minutes. For the 100 Year 24-hour SCS event, the maximum ponding depth is 24 cm and the maximum ponding duration is 4 hours and 54 minutes. Note that for both events the ponding duration is less than the rainfall duration (3 Hours and 24 Hours), as such it is expected that there will be no nuisance ponding throughout this development after the rainfall event has finished for events up to and including the 100-year.

Table 1B: Major System Maximum Ponding Depth and Duration[1]

Node	100yrChicago3hr		100YrSCS24	
	Max Ponding Depth (m)	Ponding Duration (hh:mm)	Max Ponding Depth (m)	Ponding Duration (hh:mm)
J10	6	00:31	5	00:22
J104	4	00:50	3	00:44
J14	22	02:41	21	03:34
J16	7	00:30	6	00:20
J17	3	00:15	2	00:04
J2	16	00:41	13	00:31
J20	9	01:17	8	01:04
J22	3	00:38	2	00:33
J25	5	00:59	4	00:59
J27	4	00:23	3	00:14
J29	13	00:41	11	00:35
J3	22	01:20	19	01:04
J31	22	01:12	20	01:03
J33	12	00:40	10	00:32
J35	4	00:20	4	00:16
J37	19	01:10	18	01:02
J39	1	00:04	1	00:00
J4	12	01:39	11	01:35
J45	5	00:18	0	00:00
J48	13	00:55	8	00:58
J5	5	00:53	4	00:50
J50	4	00:18	2	00:11
J52	5	00:21	4	00:14
J56	25	01:50	24	02:00
J59	13	01:29	12	01:30
J6	0	00:00	0	00:00
J62	0	00:00	0	00:00
J64	0	00:00	0	00:00
J66	13	00:40	11	00:29
J69	26	02:44	24	04:54
J71	11	00:40	9	00:28
J73	0	00:00	0	00:00
J76	21	01:28	18	01:30
J77	16	00:41	13	00:36
J8	0	00:00	0	00:00
J80	0	00:00	0	00:00
J82	11	00:35	9	00:30
J83	16	01:23	13	01:19
J86	0	00:00	0	00:00
J87	0	00:00	0	00:00
J89	0	00:00	0	00:00
J91	3	00:11	2	00:10
J92	9	01:19	8	01:03
Maj-002	0	00:00	0	00:00
Average	**9**	**00:43**	**7**	**00:42**
Maximum	**26**	**02:44**	**24**	**04:54**

[1] Ponding duration calculated as duration throughout the simulation where the ponding depth is greater than 1cm

4.2 Minor System and Hydraulic Gradeline Analysis

The minor system analysis was completed using the PCSWMM program based on the peak flows captured during the rainfall events. Note that the storm sewer design is as provided by DSEL, and a Manning's roughness coefficient of 0.013 was used for concrete and PVC storm sewer pipes. Refer to Appendix C for maintenance hole loss coefficients used in the PCSWMM model.

The proposed development has two independent storm sewer networks that both ultimately discharge to the Avalon West SWM pond. As established above the maximum allowable release rate for these lands has been set at 220 L/s/ha. Based on the detailed design completed by DSEL the site will have a total drainage area of 4.04 ha, with 2.28 draining to the east (MH 6559) storm sewer network and 1.76 ha drainage to the south (MH-6608) storm sewer network, refer to Figure 2 for the extents of each of the storm sewer networks. Table 2A below outlines the maximum allowable release rates for each of these storm sewer networks.

Table 2A: Maximum allowable release rates for Cassette Development

Location	Drainage Area (ha)	Maximum Unitary Release Rate (L/s/ha)	Maximum Allowable Release Rate (L/s)
MH-6559 (East)	2.28	220	502
MH-6608 (South)	1.76	220	387
Total	4.04	220	889

Note: The total flows calculated as per PCSWMM model peak reported inflow values (1-minute interval)

The minor system performance for this site was analyzed under a fixed downstream elevation of 85.48m for MH-6608 (south outlet) and 85.47m for MH 6559 (east outlet). The HGL values outlined above are as per the maximum 100-year HGL at existing MH 6608 and MH 6559 as modelled in either the June 2019 SWM Report for Summerside South Phase 1 or as per March 13, 2018, Avalon West Stage 6 Major System Stormwater Analysis memo by IBI Group, reference document provided in Appendix C. Table 2B presents the peak minor system outflows obtained based on the rational method and the detailed model simulations.

Table 2B: Comparison of Minor System Flows (3-Hour Chicago Storm) from the Development

Location	DSEL Rational Method Flow (m^3/s)	2-Year PCSWMM Flow (m^3/s)	5-Year PCSWMM Flow (m^3/s)	100-Year PCSWMM Flow (m^3/s)
MH-6559 (East)	0.339	0.307	0.407	0.491
MH-6608 (South)	0.190	0.196	0.268	0.384

Note: The total flows calculated as per PCSWMM model peak reported inflow values (1-minute interval)

Table 2B shows that the total 2-year flows simulated by the PCSWMM models for the south storm sewer network (MH-6608) are very similar to the rational method calculations (difference of +6 L/s). For the east storm (MH-6559) sewer network the simulated 2-year flows are slightly less (-32 L/s) than that calculated by DSEL's rational method calculations, but these rational calculations are less than that simulated by the PCSWMM model for the 5-year event. This

discrepancy can be explained by the fact that the rational method calculations are based on a mix of 2 & 5-year capture rates (mixed-use block). While the detailed model simulates runoff for these subcatchments based on a single rainfall event (e.g. 2-Year event), as such it is expected that the rational method calculations fall somewhere between the 2- and 5-year flow determined from the detailed SWM modelling.

The PCSWMM simulations have determined that for the selected 2-, 5- and 100-year 3-Hour Chicago storms, the total minor system flows from the Cassette east (MH-6559) storm sewer network would be 0.307 m^3/s, 0.407 m^3/s and 0.491 m^3/s, respectively, and the total minor system flows from the Cassette south (MH-6608) storm sewer network would be 0.196 m^3/s, 0.268 m^3/s and 0.384 m^3/s, respectively. It is important to note that the 100-year flows (both SCS and CHI) for both east and west storm sewers are less than that specified in Table 2A. As such, the proposed development is releasing at a rate lower than the 220 L/s/ha specified and will not have any adverse impacts on the downstream developments or SWM pond operations.

Additionally, the 5-Year flow calculations from the subject storm sewer networks per Atrel's March 2017, Neighbourhood 5 - Avalon Encore - Western Trunk study assumed a peak flow of 408L/s to MH-6559 (East) and 456L/s to MH-6608 (South), see Appendix B for the rational method calculation sheet from the study referenced above. As per Table 2B above the detailed simulated 5-year flows to these respective storm sewer locations have been determined to be 407L/s (-1L/s) and 268 L/s (-188 L/s), as such the proposed development will not adversely affect the existing storm sewer network. Although the 100-year flow will surcharge some parts of the minor system, a freeboard of 0.3 m between the 100-year hydraulic grade line and the underside of footings has been provided throughout the proposed development due to the various levels of service provided.

Tables C-1A and C-6B of Appendix C summarize the pipe data and hydraulic simulation results for the 100-year 3-hour Chicago storm, 100-year 24-hour SCS Type II storm, and the three historical events. Note that a minimum freeboard of 0.3 m between the hydraulic grade line and the underside of footings has been provided throughout the proposed developments for the 100-year storms and for all historical events. Additionally, note that the majority of the flowing full pipe velocities are no less than 0.80 m/s and no greater than 3.0 m/s. If velocities are over 3.0 m/s, provisions shall be made to protect against displacement of sewers by sudden jarring or movement. Velocities greater than 6 m/s are not permitted.

Table C-6B of Appendix C presents the climate change stress test results for the hydraulic grade line analysis based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. Under these conditions, no locations within the proposed developments have a USF freeboard less than 0 m, with a minimum freeboard of 44cm from the USF at Unit 5-1.

Table 3 presents the composite hydraulic grade line results for the 100-year 3-hour Chicago and 100-year 24-hour SCS Type II design storms. The maximum HGL at each Maintenance Hole is interpolated between each connection and compared to the USF of each unit within that storm sewer connection. Based on Table 3 below the minimum freeboard for the 100-year event is 45cm at Unit 5-1, with an average freeboard across the development of 88cm.

Table 3: Composite Hydraulic Grade Line Results for 100-Year Design Storms
(Fixed Downstream Boundary)

US MH	DS MH	Lateral	U/S HGL (m)	Dist from DS MH (m)	Pipe Length (m)	U/S MH HGL (m)	D/S MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.10	86.05	86.05	1.44
MH-1	MH-2	2-5	86.63	9.0	72.2	86.10	86.05	86.05	0.58
MH-1	MH-2	26-3	87.49	13.1	72.2	86.10	86.05	86.06	1.43
MH-1	MH-2	2-4	86.63	16.6	72.2	86.10	86.05	86.06	0.57
MH-1	MH-2	26-4	87.49	20.7	72.2	86.10	86.05	86.06	1.43
MH-1	MH-2	2-3	86.63	24.2	72.2	86.10	86.05	86.06	0.57
MH-1	MH-2	26-5	87.49	26.9	72.2	86.10	86.05	86.07	1.42
MH-1	MH-2	2-2	86.63	31.8	72.2	86.10	86.05	86.07	0.56
MH-1	MH-2	25-1	87.49	35.1	72.2	86.10	86.05	86.07	1.42
MH-1	MH-2	2-1	86.63	39.5	72.2	86.10	86.05	86.07	0.56
MH-1	MH-2	25-2	87.49	42.7	72.2	86.10	86.05	86.08	1.41
MH-1	MH-2	25-3	87.49	47.5	72.2	86.10	86.05	86.08	1.41
MH-1	MH-2	1-4	86.73	50.5	72.2	86.10	86.05	86.08	0.65
MH-1	MH-2	25-4	87.49	55.1	72.2	86.10	86.05	86.09	1.40
MH-1	MH-2	1-3	86.73	58.1	72.2	86.10	86.05	86.09	0.64
MH-1	MH-2	25-5	87.49	61.3	72.2	86.10	86.05	86.09	1.40
MH-1	MH-2	1-2	86.73	65.7	72.2	86.10	86.05	86.09	0.64
MH-1	MH-2	1-1	86.73	69.7	72.2	86.10	86.05	86.10	0.63
MH-10	MH-12	10-1	86.5	2.3	46.4	85.91	85.80	85.80	0.70
MH-10	MH-12	9-3	86.37	13.2	46.4	85.91	85.80	85.83	0.54
MH-10	MH-12	9-2	86.37	20.9	46.4	85.91	85.80	85.85	0.52
MH-10	MH-12	9-1	86.37	28.5	46.4	85.91	85.80	85.87	0.50
MH-10	MH-12	8-3	86.42	39.5	46.4	85.91	85.80	85.90	0.52
MH-10	MH-12	8-2	86.42	44.4	46.4	85.91	85.80	85.91	0.51
MH-11	MH-10	17-1	86.48	13.0	86.5	86.07	85.91	85.94	0.54
MH-11	MH-10	19-5	86.53	14.1	86.5	86.07	85.91	85.94	0.59
MH-11	MH-10	17-2	86.48	20.6	86.5	86.07	85.91	85.95	0.53
MH-11	MH-10	19-4	86.53	21.7	86.5	86.07	85.91	85.95	0.58
MH-11	MH-10	17-3	86.48	28.2	86.5	86.07	85.91	85.96	0.52
MH-11	MH-10	19-3	86.53	29.3	86.5	86.07	85.91	85.97	0.56
MH-11	MH-10	19-2	86.53	36.9	86.5	86.07	85.91	85.98	0.55
MH-11	MH-10	18-1	86.57	39.2	86.5	86.07	85.91	85.98	0.59
MH-11	MH-10	19-1	86.53	44.5	86.5	86.07	85.91	85.99	0.54
MH-11	MH-10	18-2	86.57	46.8	86.5	86.07	85.91	86.00	0.57
MH-11	MH-10	18-3	86.57	54.4	86.5	86.07	85.91	86.01	0.56
MH-11	MH-10	20-5	86.66	55.5	86.5	86.07	85.91	86.01	0.65
MH-11	MH-10	20-4	86.66	63.1	86.5	86.07	85.91	86.03	0.63
MH-11	MH-10	20-3	86.66	70.8	86.5	86.07	85.91	86.04	0.62
MH-11	MH-10	20-2	86.66	78.4	86.5	86.07	85.91	86.06	0.60
MH-11	MH-10	20-1	86.66	83.6	86.5	86.07	85.91	86.07	0.59
MH-12	MH-13	11-2	86.5	1.2	11.1	85.80	85.75	85.75	0.75
MH-12	MH-13	11-1	86.5	2.5	11.1	85.80	85.75	85.76	0.74
MH-12	MH-13	10-3	86.5	7.1	11.1	85.80	85.75	85.78	0.72
MH-12	MH-13	10-2	86.5	9.4	11.1	85.80	85.75	85.79	0.71
MH-13	MH-14	16-2	86.34	6.4	21.4	85.75	85.58	85.63	0.71
MH-13	MH-14	16-3	86.34	14.0	21.4	85.75	85.58	85.69	0.65
MH-13	MH-14	11-3	86.5	18.6	21.4	85.75	85.58	85.73	0.77
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.83	85.84	0.70
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.83	85.85	0.69
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.83	85.86	0.68
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.83	85.87	0.67
MH-16	MH-17	13-3	86.27	1.2	10.2	85.83	85.81	85.82	0.45
MH-17	MH-14	16-1	86.34	2.3	52.5	85.81	85.58	85.59	0.75
MH-17	MH-14	15-3	86.37	12.2	52.5	85.81	85.58	85.64	0.73
MH-17	MH-14	12-1	86.27	16.0	52.5	85.81	85.58	85.65	0.62
MH-17	MH-14	15-2	86.37	19.8	52.5	85.81	85.58	85.67	0.70
MH-17	MH-14	12-2	86.27	23.6	52.5	85.81	85.58	85.69	0.58
MH-17	MH-14	15-1	86.37	27.4	52.5	85.81	85.58	85.70	0.67
MH-17	MH-14	12-3	86.27	31.2	52.5	85.81	85.58	85.72	0.55
MH-17	MH-14	13-1	86.27	42.2	52.5	85.81	85.58	85.77	0.50
MH-17	MH-14	13-2	86.27	49.8	52.5	85.81	85.58	85.80	0.47
MH-2	MH-3	3-3	86.52	1.5	13.0	86.05	86.02	86.02	0.50
MH-2	MH-3	3-2	86.52	5.5	13.0	86.05	86.02	86.03	0.49
MH-2	MH-3	26-1	87.49	9.6	13.0	86.05	86.02	86.04	1.45
MH-2	MH-3	3-1	86.52	11.8	13.0	86.05	86.02	86.04	0.48
MH-3	MH-4	5-1	86.44	2.0	33.0	86.02	85.99	85.99	0.45
MH-3	MH-4	4-3	86.49	13.0	33.0	86.02	85.99	86.00	0.49
MH-3	MH-4	4-2	86.49	20.6	33.0	86.02	85.99	86.01	0.48
MH-3	MH-4	4-1	86.49	28.2	33.0	86.02	85.99	86.02	0.47
MH-4	MH-6	5-4	86.44	10.6	31.5	85.99	85.72	85.81	0.63
MH-4	MH-6	5-3	86.44	18.2	31.5	85.99	85.72	85.88	0.56
MH-4	MH-6	5-2	86.44	24.5	31.5	85.99	85.72	85.93	0.51
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.99	86.03	1.48
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.99	86.03	1.46
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.99	86.05	1.46
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.99	86.06	1.43
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.99	86.07	1.44

Table 3: Composite Hydraulic Grade Line Results for 100-Year Design Storms
(Fixed Downstream Boundary)

US MH	DS MH	Label	U/E (m)	Dist from DS MH (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.99	86.07	1.42
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.99	86.09	1.42
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.99	86.10	1.39
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.99	86.11	1.40
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.99	86.12	1.37
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.99	86.13	1.38
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.99	86.14	1.35
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.99	86.16	1.35
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.99	86.17	1.32
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.99	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.99	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.99	86.20	1.31
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.99	86.21	1.28
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.99	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.99	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.99	86.24	0.89
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.99	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.09	85.76	85.81	0.74
MH-7	MH-8	23-12	87.51	12.0	88.3	86.09	85.76	85.81	1.70
MH-7	MH-8	23-11	87.51	18.2	88.3	86.09	85.76	85.83	1.68
MH-7	MH-8	22-2	86.55	19.1	88.3	86.09	85.76	85.83	0.72
MH-7	MH-8	23-10	87.51	25.8	88.3	86.09	85.76	85.86	1.65
MH-7	MH-8	22-3	86.55	26.7	88.3	86.09	85.76	85.86	0.69
MH-7	MH-8	23-9	87.51	30.6	88.3	86.09	85.76	85.88	1.63
MH-7	MH-8	22-4	86.55	34.3	88.3	86.09	85.76	85.89	0.66
MH-7	MH-8	23-8	87.51	38.2	88.3	86.09	85.76	85.90	1.61
MH-7	MH-8	22-5	86.55	41.9	88.3	86.09	85.76	85.92	0.63
MH-7	MH-8	23-7	87.51	44.4	88.3	86.09	85.76	85.93	1.58
MH-7	MH-8	24-12	87.51	52.6	88.3	86.09	85.76	85.96	1.55
MH-7	MH-8	21-1	86.55	52.9	88.3	86.09	85.76	85.96	0.59
MH-7	MH-8	24-11	87.51	60.2	88.3	86.09	85.76	85.99	1.52
MH-7	MH-8	21-2	86.55	60.6	88.3	86.09	85.76	85.99	0.56
MH-7	MH-8	24-10	87.51	65.0	88.3	86.09	85.76	86.00	1.51
MH-7	MH-8	21-3	86.55	68.2	88.3	86.09	85.76	86.02	0.53
MH-7	MH-8	24-9	87.51	72.6	88.3	86.09	85.76	86.03	1.48
MH-7	MH-8	21-4	86.55	75.8	88.3	86.09	85.76	86.04	0.51
MH-7	MH-8	24-8	87.13	77.4	88.3	86.09	85.76	86.05	1.08
MH-7	MH-8	21-5	86.55	83.4	88.3	86.09	85.76	86.07	0.48
MH-7	MH-8	24-7	87.13	85.0	88.3	86.09	85.76	86.08	1.05
MH-8	MH-6	6-1	86.6	11.2	12.7	85.76	85.72	85.76	0.84
MH-9	MH-10	8-1	86.42	8.4	56.0	85.94	85.91	85.92	0.50
MH-9	MH-10	7-3	86.49	19.4	56.0	85.94	85.91	85.92	0.57
MH-9	MH-10	7-2	86.49	27.0	56.0	85.94	85.91	85.92	0.57
MH-9	MH-10	7-1	86.49	34.6	56.0	85.94	85.91	85.93	0.56
MH-9	MH-10	6-3	86.6	45.6	56.0	85.94	85.91	85.93	0.67
MH-9	MH-10	6-2	86.6	53.3	56.0	85.94	85.91	85.94	0.66
								Min	0.45
								Max	1.70
								Average	0.88

5 EROSION AND SEDIMENT CONTROL DURING AND AFTER CONSTRUCTION

Silt and erosion control strategies shall be implemented during construction activities to minimize the transfer of silt off-site. The following measures should be implemented:

i) Silt control fences shall be installed as required to prevent the movement of silt off-site during rainfall events.

ii) Construction of a mud mat shall be installed at the site entrance to promote self-cleaning of truck tires when leaving the site.

iii) All catch basins shall be equipped with a crushed stone filter to prevent the capture of silt in the storm sewer system.

iv) Regular cleaning of the adjacent roads shall be undertaken during the construction activities.

v) Regular inspection and maintenance of the silt control measures shall be undertaken until the site has been stabilized.

vi) The erosion and sediment control devices shall be removed after the site has been stabilized.

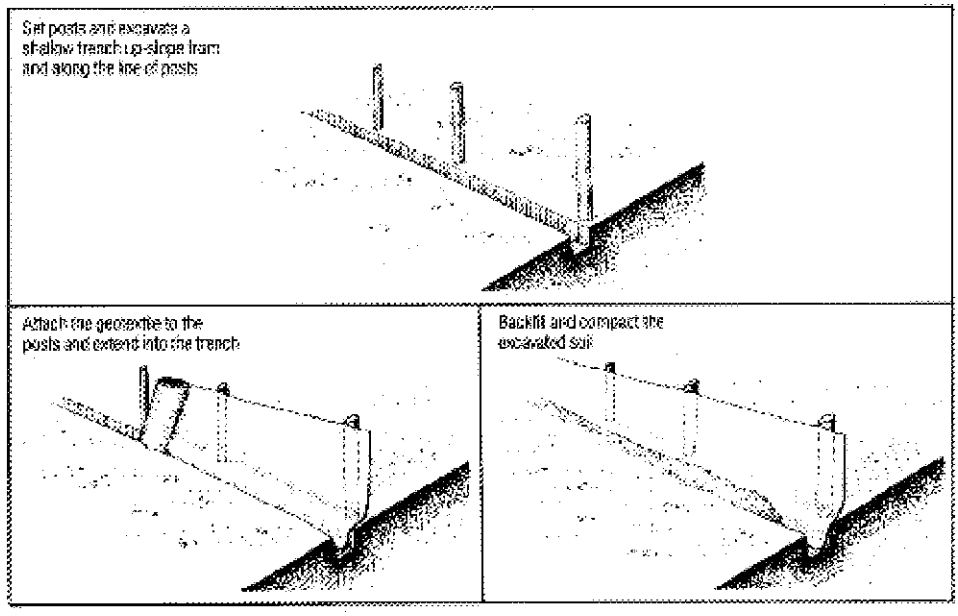


Figure 7: Typical installation of silt fences

6 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The Cassette Subdivision is located off 2275 Mer-Bleue Road, Orleans, within the City of Ottawa. The development has a drainage area of 4.04 ha, which will be treated by the existing Avalon West (N5) SWM Facility, south of Avalon Encore Stage 5, which will provide both the quantity and quality control for the subject site before discharging to McKinnon's Creek to the south.

Per the City of Ottawa design guidelines, the minor system has been designed to accommodate a minimum of the 2-year post-development flows from within the site and from external areas (plus 5-year flows on collector and 10-year flows on arterial roads). The PCSWMM model has determined that the minor system will surcharge in most parts of the system. However, with the use of Inlet Control Devices, a minimum freeboard of 0.3 m is provided between the 100-year hydraulic grade line and the underside of footings throughout the subdivision.

The PCSWMM simulations have determined that for the selected 2-, 5- and 100-year 3-Hour Chicago storms, the total minor system flows from the Cassette development will not exceed the specified 220L/s/ha limit which was set based on previous studies.

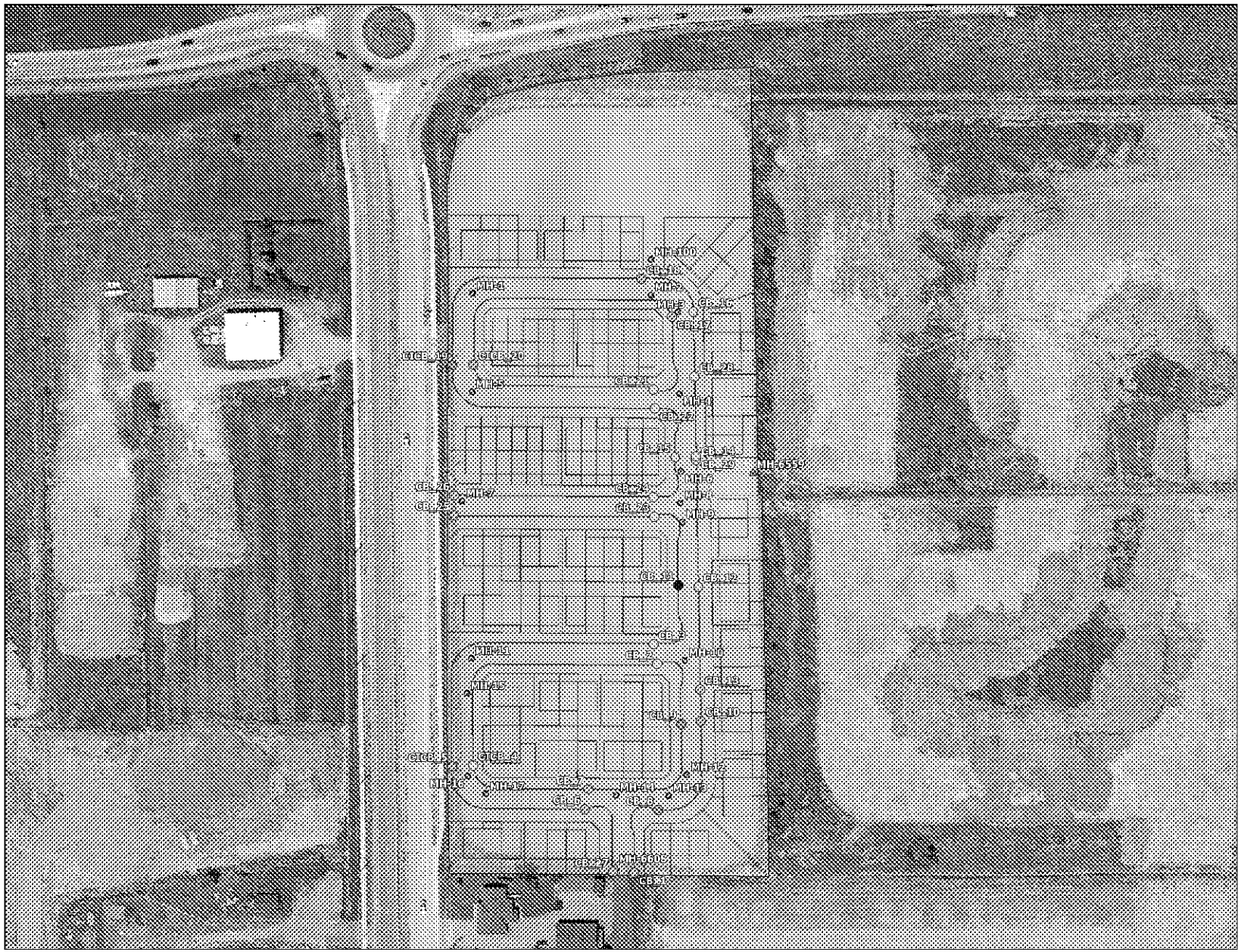
Within the subdivision, the peak water depths do not exceed the maximum allowable 35 cm depth at the gutter for the simulated 100-year storm. Furthermore, it was determined that for the 100-year event, the product of the velocity and depth of flow does not exceed the maximum allowable 0.60 m^2/s. Also as required, the maximum extent of surface water during the 100-year + 20% stress test will not touch the building envelopes.

Table C1A- C6B of Appendix C summarizes the hydraulic grade line analysis for the various storm. Note that the full pipe velocities are generally no less than 0.80 m/s and no greater than 3.0 m/s for the proposed pipes.

Stress test results for the major and minor drainage systems based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*, are summarized in Section 4.

Recommendations for silt and erosion control strategies to be implemented during construction are presented in Section 6.

In conclusion, the proposed design satisfies all selected design guidelines and requirements.



Legend

- Site Plan
- Site Area

Minor Outfalls
- MH

Conduits
- Minor System

Minor Junctions
- MH

ICDs
- 83mm Circular Orifice
- 94mm Circular Orifice
- 102mm Circular Orifice
- 108mm Circular Orifice
- 127mm Circular Orifice
- 152mm Circular Orifice
- 178mm Circular Orifice

N

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbank Drive (613) 836-0934
Ottawa, ON, K2S 1B9 www.jfsa.com

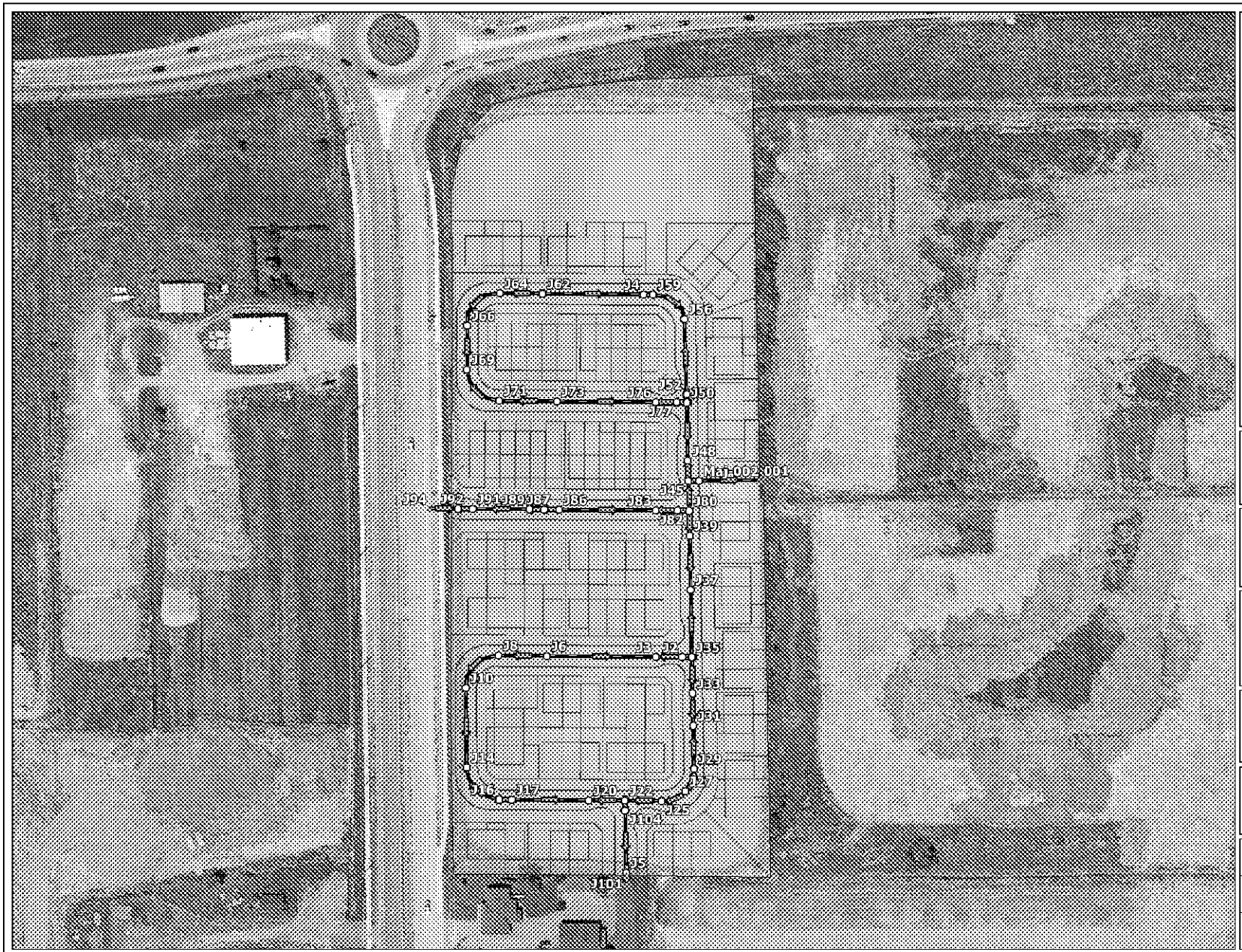
DSEL
david schaeffer engineering ltd

Mer Bleue Subdivision

Figure 2: Minor System

PROJECT	2321
DRAWN	JB
DATE	June 2022

C:\Users\Dave\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER - Documents\PROJ\2321 221202206 Sum 2\Design\GIS\20220622 Report Figures



Legend

- Site Plan
- Site Area
- Major System Conduit
- Major System Junction
- Outfall

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbank Drive
Ottawa, ON, K2S 1B9
(613) 836-0934
www.jfsa.com

DSEL
david schaeffer engineering ltd

Mer Bleue Subdivision

Figure 3: Major System

PROJECT	2321
DRAWN	MP
DATE	MAY 2022

C:\Users\Public\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER - Documents\PROJ\2321 221202204 Sub\1\Design\GIS\20220429 Report Figures

Legend

- Site Plan
- Subcatchments
  - <NAME>
  - <AREA>
  - <% IMP>

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
52 Springbrook Drive
Ottawa, ON, K2S 1B9
(613) 836-0934
www.jfsa.com

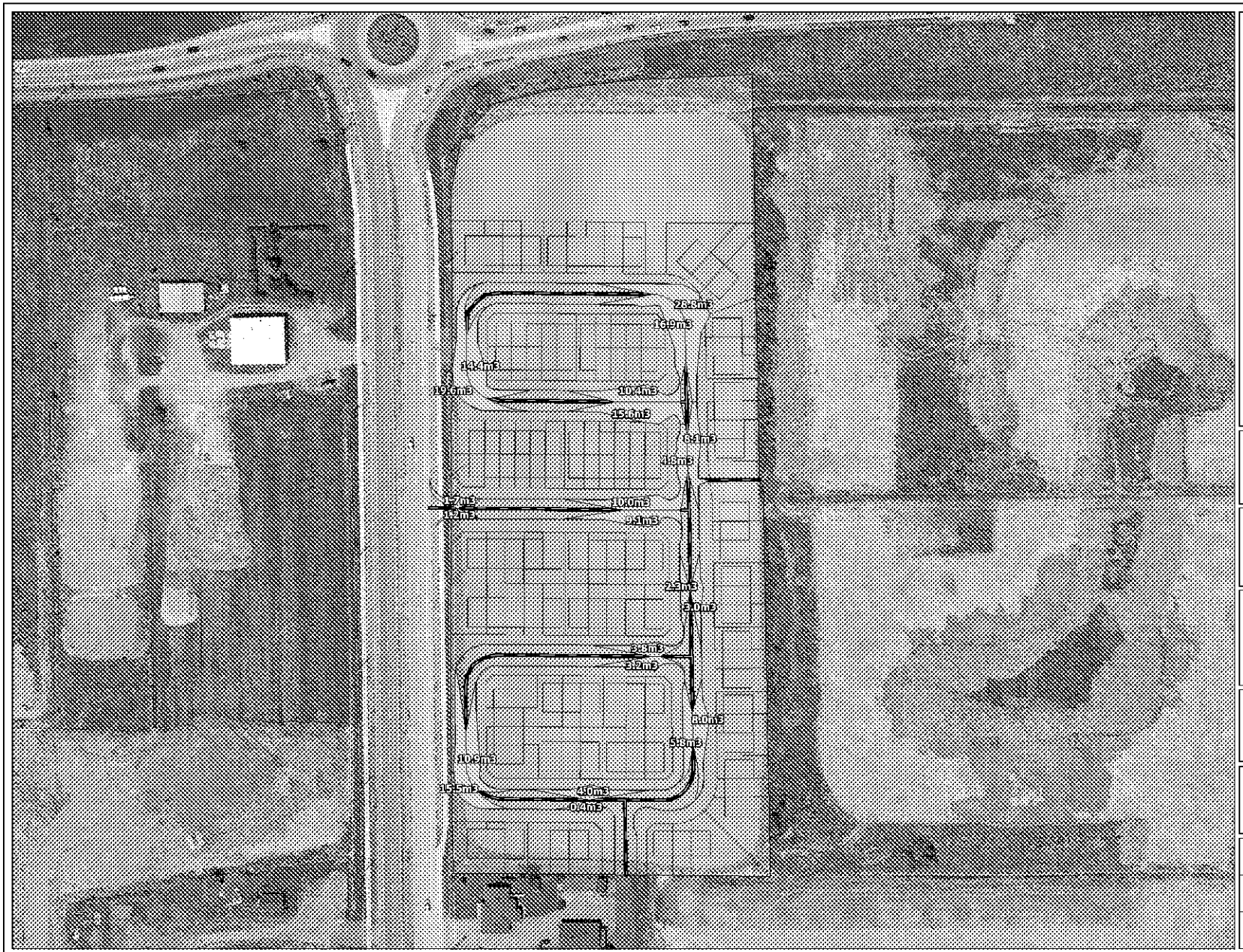
DSEL
david schaeffer engineering ltd

Mer Bleue Subdivision

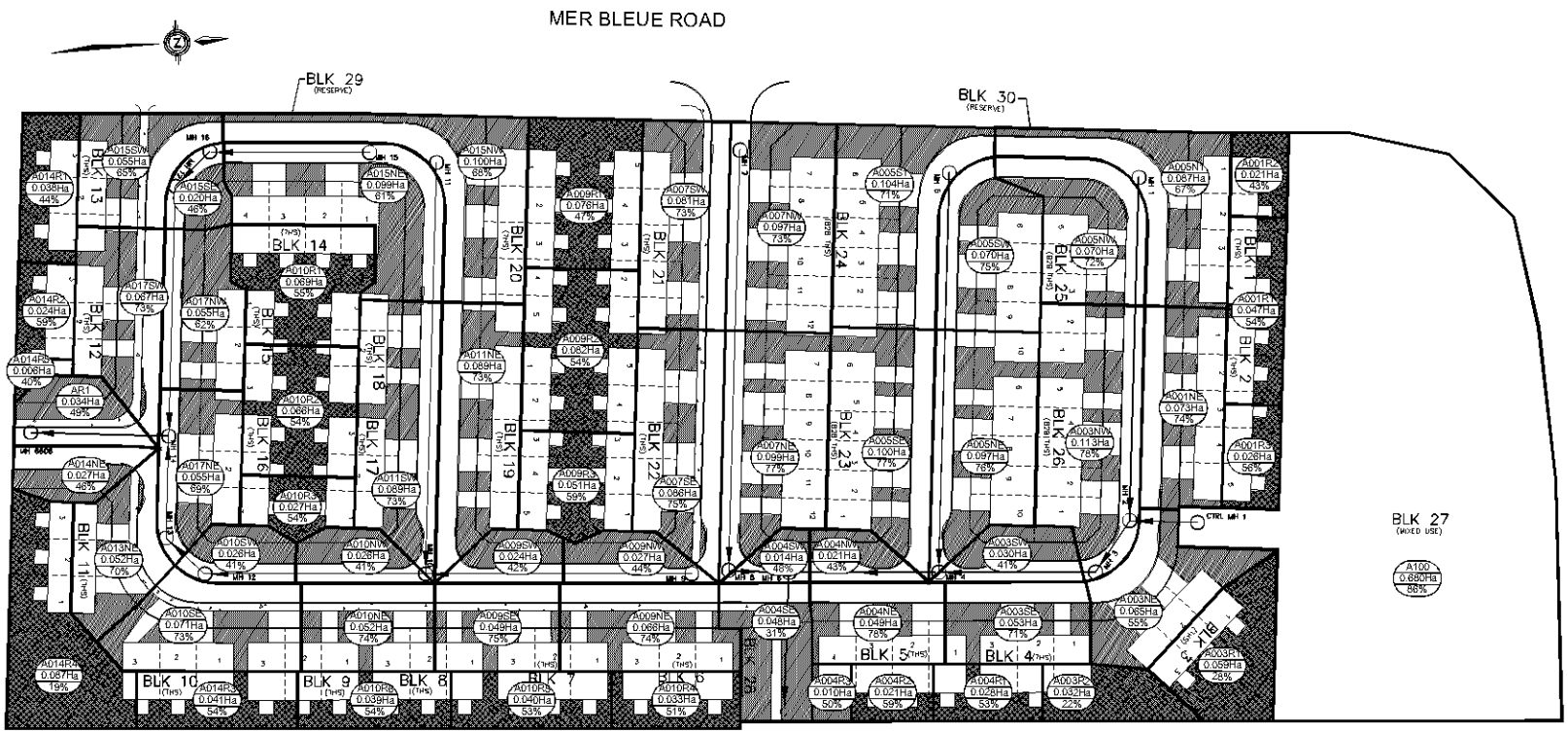
Figure 4: Subcatchments

PROJECT	2321
DRAWN	JB
DATE	June 2022

C:\Users\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER - Documents\PROJ\2321 22\202206 Submission\GIS\20220622 Report Figures



C:\Users\David\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER - Documents\PROJ\2321 221202204 Submit\Design\GIS\20220429 Report Figures



LEGEND

TRIBUTARY BUBBLE ID — A540NE
TOTAL TRIBUTARY AREA IN HECTARES — 0.033Ha
IMPERVIOUSNESS PERCENTAGE — 62%
TOTAL PERVIOUS AREA IN HECTARES — 0.013Ha
FRONT YARD/ROAD PERVIOUS HATCH
REAR YARD PERVIOUS HATCH

DSEL
120 Iber Road, Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

CAIVAN (MER BLEUE) INC. - CASSETTE SUBDIVISON (2275 MER BLEUE ROAD)

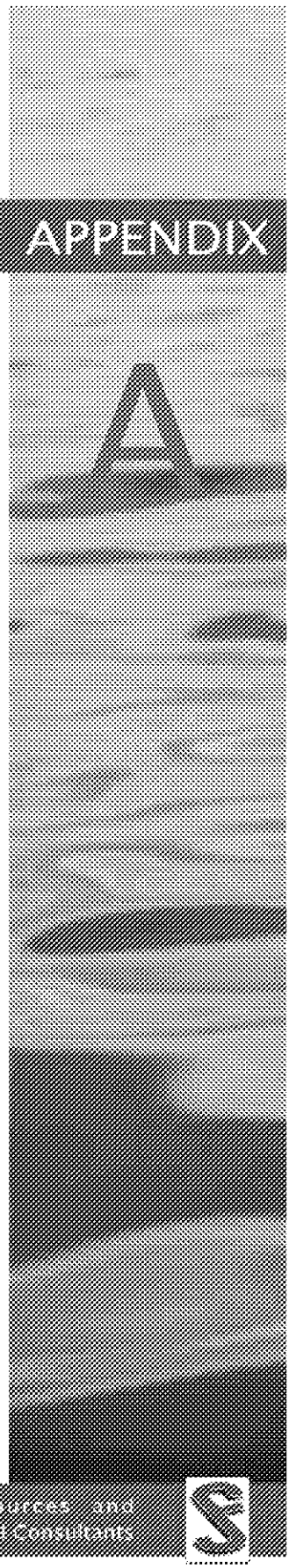
CITY OF OTTAWA

IMPERVIOUSNESS HATCH FIGURE

SCALE:	1:1000	PROJECT No.:	20-1214
DATE:	MAY 2022	FIGURE:	6

000186

APPENDIX



Rational Method Design Sheets
(as per DSEL)

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

	LOCATION		AREA (Ha) 2 YEAR				AREA (Ha) 5 YEAR				AREA (Ha) 10 YEAR				AREA (Ha) 100 YEAR				FLOW						SEWER DATA							
			AREA		Indiv.	Accum.	AREA		ndiv.	Accum.	AREA		Indiv.	Accum.	AREA		ndiv.	Accum.	Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
Location	From Node	To Node	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW(min	Q/Q full
ave Broadcast Avenue																																
	7	8	0.36	0.73	0.74	0.74			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	57	450	450	CONC	0.20	88.5	127.5033	0.8017	1.8399	0.444
To voie Ryan Reynolds Way, Pipe 8 - 6						0.74				0.00				0.00				0.00	11.84													
BLOCK 27																																
	100	2			0.00	0.00	0.68	0.80	1.51	1.51			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	158	525	525	CONC	0.25	14.5	215.0311	0.9933	0.2433	0.733
To voie Ryan Reynolds Way, Pipe 2 - 3						0.00				1.51				0.00				0.00	10.24													
BLOCK 28																																
Contribution From voie Ryan Reynolds Way, Pipe 4 - 6						2.22				1.51				0.00				0.00	12.74													
Contribution From voie Ryan Reynolds Way, Pipe 8 - 6						0.74				0.00				0.00				0.00	12.09													
	6	6559			0.00	2.96			0.00	1.51			0.00	0.00			0.00	0.00	12.74	67.67	91.64	0.00	156.85	339	750	750	CONC	0.15	29.0	431.1703	0.9760	0.4952	0.786
voie Ryan Reynolds Way																																
	5	4	0.53	0.71	1.04	1.04			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	80	450	450	CONC	0.20	84.0	127.5033	0.8017	1.7463	0.628
			0.17	0.66	0.30	0.30			0.00	0.00			0.00	0.00			0.00	0.00														
	9	10	0.21	0.57	0.33	0.64			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	49	450	450	CONC	0.25	56.0	142.5531	0.8963	1.0413	0.343
Contribution From ave Broadcast Avenue, Pipe 7 - 8						0.74				0.00				0.00				0.00	11.84													
	8	6			0.00	0.74			0.00	0.00			0.00	0.00			0.00	0.00	11.84	70.40	95.38	0.00	163.32	52	600	600	CONC	0.15	12.5	237.8056	0.8411	0.2477	0.218
To BLOCK 28, Pipe 6 - 6559						0.74				0.00				0.00				0.00	12.09													
	15	16	0.27	0.65	0.50	0.50			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	38	375	375	PVC	0.30	33.5	96.0323	0.8695	0.6421	0.396
	16	17			0.00	0.50			0.00	0.00			0.00	0.00			0.00	0.00	10.64	74.42	100.92	0.00	172.89	37	375	375	PVC	0.30	10.0	96.0323	0.8695	0.1917	0.384
	17	14	0.18	0.67	0.33	0.82			0.00	0.00			0.00	0.00			0.00	0.00	10.83	73.75	99.99	0.00	171.28	61	450	450	CONC	0.20	52.5	127.5033	0.8017	1.0914	0.477
To SCULPIN STREET, Pipe 14 - 6608						0.82				0.00				0.00				0.00	11.93													
			0.07	0.72	0.15	0.15			0.00	0.00			0.00	0.00			0.00	0.00														
	1	2	0.09	0.56	0.15	0.29			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	22	375	375	PVC	0.30	72.0	96.0323	0.8695	1.3801	0.234
Contribution From BLOCK 27, Pipe 100 - 2						0.00				1.51				0.00				0.00	10.24													
	2	3			0.00	0.29			0.00	1.51			0.00	0.00			0.00	0.00	11.38	71.88	97.43	0.00	166.86	168	600	600	CONC	0.15	13.0	237.8056	0.8411	0.2576	0.708
			0.12	0.43	0.14	0.43			0.00	1.51			0.00	0.00			0.00	0.00														
	3	4	0.26	0.67	0.49	0.92			0.00	1.51			0.00	0.00			0.00	0.00	11.64	71.04	96.27	0.00	164.86	211	675	675	CONC	0.15	33.0	325.5584	0.9098	0.6045	0.648
			0.03	0.59	0.05	2.01			0.00	1.51			0.00	0.00			0.00	0.00														
	4	6	0.13	0.57	0.21	2.22			0.00	1.51			0.00	0.00			0.00	0.00	12.24	69.15	93.67	0.00	160.37	295	675	675	CONC	0.20	31.5	375.9224	1.0505	0.4998	0.785
To BLOCK 28, Pipe 6 - 6559						2.22				1.51				0.00				0.00	12.74													
	11	10	0.18	0.71	0.35	0.35			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	27	375	375	PVC	0.30	86.5	96.0323	0.8695	1.6581	0.281
			0.11	0.57	0.18	1.16			0.00	0.00			0.00	0.00			0.00	0.00														
			0.16	0.58	0.26	1.43			0.00	0.00			0.00	0.00			0.00	0.00														
	10	12	0.18	0.65	0.32	1.74			0.00	0.00			0.00	0.00			0.00	0.00	11.66	70.98	96.18	0.00	164.70	124	525	525	CONC	0.20	46.5	192.3297	0.8885	0.8723	0.643
	12	13			0.00	1.74			0.00	0.00			0.00	0.00			0.00	0.00	12.53	68.29	92.49	0.00	158.32	119	525	525	CONC	0.20	11.0	192.3297	0.8885	0.2063	0.618
	13	14	0.05	0.69	0.10	1.84			0.00	0.00			0.00	0.00			0.00	0.00	12.74	67.68	91.66	0.00	156.89	125	525	525	CONC	0.20	21.5	192.3297	0.8885	0.4033	0.648
To SCULPIN STREET, Pipe 14 - 6608						1.84				0.00				0.00				0.00	13.14													
SCULPIN STREET																																
Contribution From voie Ryan Reynolds Way, Pipe 13 - 14						1.84				0.00				0.00				0.00	13.14													
Contribution From voie Ryan Reynolds Way, Pipe 17 - 14						0.82				0.00				0.00				0.00	11.93													
			0.03	0.54	0.04	2.71			0.00	0.00			0.00	0.00			0.00	0.00														
	14	6608	0.13	0.41	0.15	2.85			0.00	0.00			0.00	0.00			0.00	0.00	13.14	66.54	90.09	0.00	154.18	190	675	675	CONC	0.15	29.0	325.5584	0.9098	0.5313	0.583

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s

LICENSED PROFESSIONAL ENGINEER s.21 PROVINCE OF ONTARIO

Designed: A.K.	PROJECT: CASSETTE SUBDIVISION (2275 MER BLEUE ROAD)		
Checked: W.L.	LOCATION: City of Ottawa		
Dwg. Reference: Storm Drainage Plan Dwg. 19	File Ref: 20-1214	Date: Jun 2022	Sheet No. SHEET 1 OF 1

1214_STM_DesSheet2.xlsx

APPENDIX

B

Background Documentation

STORM SEWER COMPUTATION FORM

DESIGNED BY: PLM
CHECKED BY: AGS

PROJECT: **Neighbourhood 5 - Avalon Encore - Western Trunk**
CLIENT: Minto Communities Inc.
PROJECT #: 170401
BY: ATREL ENGINEERING LTD
DATE: March, 2017

STORM FREQUENCY: 5 & 10 YEAR
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

Table 1

STREET NAMES	LOCATION FROM	(Up)	TO	(Down)	0.20	0.30	0.50	0.55	0.59	0.60	0.65	0.65	0.66	0.70	0.70	0.75	0.76	0.80	RATIONAL METHOD INDIV. 2.78AR	ACCUM. 2.78AR	5 YEAR TIME CONC. (MIN)	RAINF. INTENS. (MM/HR)	FLOW (L/S)	Rational Method 10 year ACCUM 2.78AR (L/S)	RAINF. INTENS. (MM/HR)	FLOW (L/S)	ACTUAL PIPE FLOW (L/S)	PIPE TYPE	DIA. (NOM) (mm)	(ACT)	SEWER DATA SLOPE (%)	LENGTH (M)	CAP. (L/S)	Remaining Capacity (%)	VEL. (M/S)	TIME OF FLOW (MIN)	UpStream Obv. (M)	UpStream Inv. (M)	DwStream Obv. (M)	DwStream Inv. (M)
Jerome Jodoin	MH	237	MH	607		5.65		3.95	3.79				9.34	6.59	4.20		0.87		23.03	23.03	23.59	63.25	1456.95	8.29	73.99	613.37	2070.33	CONC	1800	1828.8	0.10	120.0	3792.13	45%	1.44	1.39	85.61	83.81	85.49	83.69
Jerome Jodoin	MH	607	MH	630										0.26					0.68	23.72	24.97	60.94	1445.25	8.29	71.28	590.91	2036.16	CONC	1800	1828.8	0.10	97.3	3792.13	46%	1.44	1.13	85.49	83.69	85.39	83.59
																					26.10																			
Aquarium Avenue	MH	6501	MH	6502							0.21								0.38	0.38	10.00	104.19	39.54		122.14		39.54	PVC	375	366.4	0.35	69.5	84.05	53%	0.80	1.43	86.02	85.65	85.84	85.47
Aquarium Avenue	MH	6502	MH	6503							0.19								0.34	0.72	11.43	97.19	70.25		113.90		70.25	CONC	450	457.2	0.20	72.0	133.02	47%	0.81	1.48	85.84	85.39	85.70	85.25
Aquarium Avenue	MH	6503	MH	6504																0.72	12.91	90.97	65.75		106.57		65.75	CONC	525	533.4	0.15	11.5	179.46	63%	0.80	0.24	85.70	85.18	85.68	85.16
Aquarium Avenue	MH	6504	MH	6510				0.31			0.27								0.96	1.68	13.15	90.05	151.71		105.48		151.71	CONC	600	609.6	0.15	68.0	248.09	39%	0.85	1.33	85.68	85.08	85.58	84.98
																					14.49																			
Stickleback Way	MH	6507	MH	6508							0.29								0.52	0.52	10.00	104.19	54.60		122.14		54.60	CONC	450	457.2	0.20	35.5	133.02	59%	0.81	0.73	85.80	85.35	85.73	85.28
Stickleback Way	MH	6508	MH	6509																0.52	10.73	100.49	52.66		117.78		52.66	CONC	450	457.2	0.20	11.0	133.02	60%	0.81	0.23	85.70	85.25	85.68	85.23
Stickleback Way	MH	6509	MH	6510				0.11			0.21								0.55	1.07	10.96	99.40	106.53		116.49		106.53	CONC	600	609.6	0.13	75.0	233.61	54%	0.80	1.56	85.68	85.08	85.58	84.98
																					12.52																			
Aquarium Avenue	MH	6510	MH	6511																2.76	14.49	86.26	236.01		99.85		235.01	CONC	825	838.2	0.10	62.0	473.55	50%	0.86	1.22	85.68	84.76	85.52	84.70
Aquarium Avenue	MH	6511	MH	6513							0.43								0.78	3.53	15.71	81.33	287.37		95.24		287.37	CONC	900	914.4	0.10	50.0	597.22	52%	0.91	0.92	85.52	84.62	85.47	84.57
																					16.63																			
Aquarium Avenue	MH	6512	MH	6513				0.50			0.34								1.50	1.50	10.00	104.19	156.41		122.14		156.41	CONC	600	609.6	0.10	99.0	233.61	33%	0.80	2.06	85.60	85.00	85.47	84.87
																					12.06																			
Shiner Lane	MH	6513	MH	630				0.35			0.19								1.33	6.37	16.83	78.65	500.92		92.08		500.92	CONC	1200	1219.2	0.10	72.5	1286.19	61%	1.10	1.11	85.47	84.27	85.40	84.20
																					17.74																			
Jerome Jodoin	MH	630	MH	631										0.30					0.58	30.67	26.10	59.20	1815.59	8.29	69.23	573.91	2389.50	CONC	1950	1981.2	0.10	69.0	4694.42	49%	1.52	0.76	85.40	83.45	85.33	83.38
Jerome Jodoin	MH	631	MH	631A										0.30					0.58	31.25	26.85	58.09	1815.45	8.29	67.93	563.14	2378.59	CONC	1950	1981.2	0.10	75.5	4694.42	49%	1.52	0.83	85.33	83.38	85.25	83.30
Jerome Jodoin	MH	631A	MH	658										0.22					0.43	31.68	27.68	56.93	1803.58	8.29	66.57	551.86	2355.44	CONC	1950	1981.2	0.10	105.5	4694.42	50%	1.52	1.15	85.25	83.30	85.14	83.19
																					28.83																			
Aquarium Avenue	MH	6550	MH	6551				0.21			0.30								0.86	0.86	10.00	104.19	89.94		122.14		89.94	CONC	525	533.4	0.15	74.5	179.46	50%	0.80	1.55	85.98	85.46	85.86	85.34
Aquarium Avenue	MH	6551	MH	6560				0.35			0.27								1.33	2.19	11.55	96.69	211.93		113.29		211.93	CONC	750	762.0	0.10	86.5	367.27	42%	0.81	1.79	85.86	85.11	85.77	85.02
																					13.34																			
Commercial	MH	6559	MH	6560														2.20	4.89	4.89	15.00	83.56	408.84		97.85		408.84	CONC	975	990.6	0.10	38.0	739.33	45%	0.96	0.66	85.81	84.84	85.77	84.80
																					15.66																			
Aquarium Avenue	MH	6560	MH	6570				0.33			0.25								0.67	7.75	15.66	81.49	631.75		95.41		631.75	CONC	1050	1066.8	0.10	50.0	900.87	30%	1.01	0.83	85.77	84.72	85.72	84.67
																					16.49																			
Stickleback Way	MH	6564	MH	6565							0.30								0.54	0.54	10.00	104.19	56.48		122.14		56.48	PVC	375	366.4	0.25	72.0	84.05	33%	0.80	1.51	86.03	85.66	85.84	85.47
Stickleback Way	MH	6565	MH	6566																0.54	11.51	96.86	52.51		113.51		52.51	CONC	450	457.2	0.20	12.0	133.02	61%	0.81	0.25	85.84	85.39	85.82	85.37
Stickleback Way	MH	6566	MH	6570							0.27								0.49	1.03	11.75	95.77	98.64		112.22		98.64	CONC	525	533.4	0.15	64.0	179.46	45%	0.80	1.33	85.82	85.30	85.72	85.20
																					13.08																			
Aquarium Avenue	MH	6570	MH	6571				0.42			0.24								1.05	9.83	16.49	79.04	776.86		92.54		776.86	CONC	1200	1219.2	0.10	71.0	1286.19	40%	1.10	1.07	85.72	84.52	85.65	84.45
Aquarium Avenue	MH	6571	MH	6572																9.83	17.56	76.10	747.96		89.09		747.96	CONC	1350	1371.6	0.10	13.5	1760.81	58%	1.19	0.19	85.65	84.30	85.64	84.29
Aquarium Avenue	MH	6572	MH	6573							0.55								1.01	10.84	17.75	75.61	819.66		88.51		819.66	CONC	1350	1371.6	0.10	120.0	1760.81	53%	1.19	1.68	85.61	84.26	85.49	84.14
Aquarium Avenue	MH	6573	MH	6574																10.84	19.43	71.53	775.43		83.72		775.43	CONC	1350	1371.6	0.10	14.0	1760.81	56%	1.19	0.20	85.46	84.11	85.46	84.10
Aquarium Avenue	MH	6574	MH	6575						0.24				0.25					0.89	11.73	19.62	71.09	833.70		83.19		833.70	CONC	1350	1371.6	0.10	34.0	1760.81	53%	1.19	0.48	85.42	84.07	85.39	84.04
Aquarium Avenue	MH	6575	MH	6580																11.73	20.10	70.03	821.27		81.95		821.27	CONC	1350	1371.6	0.10	28.0	1760.81	53%	1.19	0.39	85.39	84.04	85.36	84.01
																					20.49																			
Damselfish Walk	MH	6578	MH	6579						0.33				0.59					1.96	1.96	10.00	104.19	204.49		122.14		204.49	CONC	675	685.8	0.12	120.0	339.63	40%	0.92	2.18	85.69	85.02	85.51	84.84
Damselfish Walk	MH	6579	MH	6580										0.27					0.53	2.49	12.18	93.95	233.76		110.08		233.76	CONC	750	762.0	0.15	100.5	449.81	48%	0.99	1.72	85.51	84.76	85.36	84.61
																					13.89																			
Aquarium Avenue	MH	6580	MH	6581						0.35				0.18					0.93	15.15	20.49	69.19	1048.20		80.97		1048.20	CONC	1500	1524.0	0.10	73.5	2378.21	56%	1.30	0.93	85.36	83.86	85.28	83.78
Aquarium Avenue	MH	6581	MH	6616																15.15	21.42	67.29	1019.42		78.73		1019.42	CONC	1500	1524.0	0.10	19.5	2332.02	56%	1.28	0.25	85.26	83.76	85.23	83.73
																					21.67																			
Decoeur Drive	MH	6605	MH	6610						0.27				0.27					0.98	0.98	10.00	104.19	101.67		122.14		101.67	CONC	525	533.4	0.20	71.0	200.65	49%	0.90	1.32	85.62	85.10	85.48	84.96
																					11.32																			
Sculpin Street	MH	6608	MH	6609						0.37				0.25				1.96	5.46	5.46	15.00	83.56	456.46		97.85		456.46	CONC	975	990.6	0.10	115.5	739.33	38%	0.96	2.01	85.68	84.71	85.56	84.59
Sculpin Street	MH	6609	MH	6610										0.05					0.10	5.56	17.01	77.59	431.40		90.83		431.40	CONC	1050	1066.8	0.10	18.0	900.87	52%	1.01	0.30	85.56	84.51	85.54	84.49
																					17.30																			
Decoeur Drive	MH	6610	MH	6611										0.27					0.53	7.06	17.30	76.78	542.16		89.89		542.16	CONC	1050	1066.8	0.10	51.5	900.87	40%	1.01	0.85	85.48	84.43	85.43	84.38
Decoeur Drive	MH	6611	MH	6612						0.33				0.24					1.20	8.26	18.16	74.59	615.98		87.29		615.98	CONC	1200	1219.2	0.10	86.5	1286.19	52%	1.10	1.31	85.48	84.23	85.34	84.14
Decoeur Drive	MH	6612	MH	6616										0.44					0.86	9.12	19.46	71.45	651.31		83.62		651.31	CONC	1200	1219.2	0.10	102.5	1286.19	49%	1.10	1.64	85.34	84.14	85.23	84.03
																					21.11																			
Decoeur Drive	MH	6615	MH	658						0.22				0.22					1.10	25.36	21.67	66.80	1694.08		78.16		1694.08	CONC	1650	1676.4	0.15	60.0	3731.42	55%	1.69	0.61	85.23	83.58	85.13	83.48
																					22.28																			
Jerome Jodoin	MH	658	MH	659						0.15				0.29					0.83	57.87	28.83	66.39	3205.55	8.29	64.76	536.86	3742.41	CONC	2250	2286.0	0.10	80.5	6875.59	46%	1.68	0.82	85.13	82.88	85.05	82.80
Jerome Jodoin	MH	659	MH	683						0.20				0.44					1.32	59.20	29.65	54.35	3217.28	8.29	63.54	526.74	3744.03	CONC	2250	2286.0	0.10	77.0	6875.59	46%	1.68	0.77	85.05	82.80	84.97	82.72
																					30.42																			
Mer Bleue	MH	Stub 2	MH	542	11.55	0.27						3.04				0.51			6.67	6.67	25.56	60.01	400.22	6.56	70.19	460.21	860.43	CONC	1050	1066.8	0.65	70.0	2073.95	59%	2.32	0.50	84.50	83.45	84.13	83.08
																					26.07																			
Gardenpost	MH	542	MH	543																6.67	26.07	59.25	395.15	6.56	69.29	454.31	849.46	CONC	1200	1219.2	0.15	11.5	1575.26	46%	1.35	0.14	84.22	83.02	84.20	83.00
Gardenpost	MH	543	MH	544										0.31					0.60	7.27	26.21	59.03	429.29	6.56	69.04	452.67	881.96	CONC	1200	1219.2	0.15	65.5	1575.26	44%	1.35	0.81	84.14	82.94	84.04	82.84
Gardenpost	MH	544	MH	550						0.24				0.40					1.18	8.45	27.02	57.88	488.99	6.56	67.66	443.62	932.61	CONC	1200	1219.2	0.15	85.5	1575.26	41%	1.35	1.06	84.04	82.84	83.91	82.71
Gardenpost	MH	550	MH	565						0.27				0.25					0.96	9.41	28.07	56.39	530.49	6.56	65.94	432.34	962.83	CONC	1500	1524.0	0.15	77.0	2856.14	66%	1.57	0.82	84.21	82.71	84.09	82.59
																					28.89																			
Gardenpost	MH	6625	MH	6627										0.19					0.37	0.37	10.00	104.19	38.52		122.14		38.52	CONC	450	457.2	0.20	34.5	133.02	71%	0.81	0.71	85.35	84.90	85.28	84.83
																					10.71																			
Site Plan	MH	6626	MH	6627														0.81	1.80	1.80	15.00	83.56	150.53		97.85		150.53	CONC	525	533.4	0.20	10.0	245.74	39%	1.10	0.15	85.16	84.64	85.13	84.61
																					15.15																			
Gardenpost	MH	6627	MH	6628																2.17	15.15	83.07	180.36		97.28		180.36	CONC	600	609.6	0.15	19.5	248.09	27%	0.85	0.38	85.13	84.53	85.10	84.50
Gardenpost	MH	6628	MH	6629																2.17	15.53	81.87	177.75		95.87		177.75	CONC	600	609.6	0.15	10.5	248.09	28%	0.85	0.21	85.07	84.47	85.05	84.45
Gardenpost	MH	6629	MH	6635						0.12									0.20	2.37	15.74	81.24	192.65		95.13		192.65	CONC	600	609.6	0.15	40.5	248.09	22%	0.85	0.79	85.02	84.42	84.96	84.36
																					16.53																			
Park	MH	6634	MH	6635		0.88													0.74	0.74	15.00	83.56	62.02		97.85		62.02	PVC	375	366.4	0.25	11.0	84.05	26%	0.80	0.23	84.99	84.62	84.96	84.59
																					15.23																			
Gardenpost	MH	6635	MH	6636						0.23				0.49					1.42	4.53	16.53	78.91	357.79		92.39		357.79	CONC	900	914.4	0.10	115.0	597.22	40%	0.91	2.11	84.96	84.06	84.84	83.94
Gardenpost	MH	6636	MH	6640										0.27					0.53	5.06	18.64	73.38	371.27		85.89		371.27	CONC	900	914.4	0.10	78.5	597.22	38%	0.91	1.44	84.84	83.94	84.76	83.86
																					20.08																			
Guppy Grove	MH	6639	MH	6640						0.28				0.17					0.76	0.76	10.00	104.19	79.66		122.14		79.66	CONC	450	457.2	0.30	55.0	133.02	40%	0.81	1.30	84.44	83.99	84.31	83.86
																					11.30																			
Guppy Grove	MH	6640	MH	565						0.29				0.23					0.93	6.76	20.08	70.08	473.42		82.00		473.42	CONC	1050	1066.8	0.10	74.0	900.87	47%	1.01	1.22	84.31	83.26	84.24	83.19
																					21.30																			
Gardenpost	MH	565	MH	683										0.18					0.35	16.51	28.89	55.32	913.81	6.56	64.67	424.02	1337.53	CONC	1650	1676.4	0.15	72.2	3882.64	64%	1.67	0.72	84.24	82.59	84.13	82.48
																					29.62																			
Jerome Jodoin	MH	683	MH	690		0.51								0.19					0.88	76.59	30.42	53.42	4091.30	14.85	62.45	927.17	5018.46	CONC	2550	2590.8	0.10	45.0	9599.83	48%	1.82	0.41	84.97	82.42	84.92	82.37
Unopen Road allowance	MH	690	MH	691																76.59	30.83	52.94	4054.53	14.85	61.88	918.71	4973.24	CONC	2550	2590.8	0.10	58.5	9599.83	48%	1.82	0.54	84.87	82.32	84.81	82.26
Unopen Road allowance	MH	691	MH	691A		0.21													0.18	76.76	31.37	52.32	4016.21	14.85	61.16	908.02	4924.23	CONC	2550	2590.8	0.10	120.0	9599.83	49%	1.82	1.10	84.81	82.26	84.69	82.14
Unopen Road allowance	MH	691A	MH	691B		0.16													0.13	76.90	32.47	51.10	3929.38	14.85	59.73	886.79	4816.17	CONC	2550	2590.8	0.10	49.5	9599.83	50%	1.82	0.45	84.64	82.09	84.59	82.04
																					32.92																			
Mattamy	MH	99	MH	691B									20.39						37.50	37.50	22.51	65.18	2444.47		76.26		2444.47	CONC	1950	1981.2	0.12	80.0	5142.48	52%	1.67	0.80	84.71	82.76	84.61	82.66
																					23.31																			
Unopen Road allowance	MH	691B	MH	W-F-S		0.14								0.04					0.19	114.59	32.92	50.62	5800.74	14.85	59.16	878.32	6679.06	CONC	2700	SAME	0.10	45.0	15688.99	57%	1.94	0.48	84.61	81.91	84.56	81.86
																					20.04																			

Proposed storm sewers
Existing storm sewers

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS

52 Springbrook Drive
Ottawa (Stittsville), ON K2S 1B9
TEL: (613) 836- 3884
FAX: (613) 836- 0332
WEB: www.jfsa.com

March 26, 2021

David Schaeffer Engineering Limited
120 Iber Road, Unit 103
Stittsville, Ontario K2S 1E9

Attention: **Ms. Jennifer Ailey, P.Eng.**

Subject: **2275 Mer Bleue Road / Preliminary Stormwater Management Design**

our file: 1102-13

As requested by your office, we have evaluated, based on the available information as described below, the preliminary hydraulic gradeline results for the storm sewer servicing the 2275 Mer Bleue Road site.

The 2275 Mer Bleue Road site is located within the Avalon West subdivision, and is serviced by a storm sewer through the Avalon West subdivision to the existing Avalon West Stormwater Management (SWM) facility, which discharges to McKinnon's Creek. The 2275 Mer Bleue Road site has been accounted for in the sizing of the Avalon West storm sewers and pond, as designed by IBI Group. Note that an interim expansion of the existing SWM facility has been constructed in support of the Summerside South Phase 1 subdivision, in advance of improvements to downstream McKinnon's Creek, as per the June 2019 *Design Brief for Interim Expansion of the Avalon West Stormwater Management Pond for the Summerside South Phase 1 Subdivision* by DSEL/JFSA.

Preliminary hydraulic gradeline calculations for the proposed storm sewer within the 2275 Mer Bleue Road site were performed using spreadsheet calculations and are presented in Table 1. Pipe data, storm sewer layout and Rational Method flows in the storm sewer are as provided by DSEL. The Rational Method flows were calculated based on the 2-, 5- or 10-year level of service requirements, and the 100-year flows in the hydraulic gradeline calculations were estimated as 14% greater than the Rational Method flows, to account for the additional flows captured by catchbasin grates, lead pipes and / or inlet control devices under the higher surface water depths of the 100-year storm.

The 100-year boundary hydraulic gradeline elevations at the two storm sewer outlets from the site to the Avalon West storm sewer were set to match the highest simulated under the 100-year 3-hour Chicago and 100-year 24-hour SCS Type II design storms, from either the design by IBI Group or the modelling completed in support of the interim pond expansion - that is, from the March 13, 2018 *Avalon West Stage 6 Major System Stormwater Analysis* memo by IBI Group or the June 2019 *SWM Report for Summerside South Phase 1* by JFSA (for which detailed modelling of the Avalon West subdivision was incorporated into the overall model by IBI Group on Sept. 6, 2018),

As may be seen in Table 1, a freeboard of 0.3 m between the hydraulic gradeline and the estimated underside of footing elevations (estimated as 1.8 m below ground level) has been provided throughout the proposed development.

Yours truly,
J.F. Sabourin and Associates Inc.

Laura Pipkins, P.Eng.

cc: J.F. Sabourin, M.Eng, P.Eng.
Director of Water Resources Projects

Table 1: Storm Sewer Hydraulic Gradeline Calculations

Pipe Parameters											Flow Characteristics			Friction and Minor Losses						HGL Computations			USF Check	
Manhole Number		Invert Elevation		Diameter	Length	MH Cover Elev. u/s	MH Cover Elev. d/s	Width	Slope	n	Qcap	Flow [1]	V actual Q/a	per Darcy-Weisbach f	H_L	Friction Losses	Minor Loss Coefficient	Minor Losses		Surch. (u/s)	HGL (u/s)	HGL (d/s)	USF [2]	Freeboard To USF
(u/s)	(d/s)	(u/s)	(d/s)																					
		(m)	(m)	(mm)	(m)	(m)	(m)	(mm)	(%)		(L/s)	(L/s)	(m/s)		(m)	(m)		(m)	(m)	(m)	(m)	(m)		(m)
1	3	85.95	85.71	375	78.5	88.45	88.42	N/A	0.30	0.013	96	68	0.949	0.029	0.119	0.119	0.39	0.018	0.137	-0.142	86.178	85.881	86.65	0.472
2	3	85.66	85.56	525	28.0	88.41	88.41	N/A	0.35	0.013	254	203	1.307	0.026	0.063	0.063	0.47	0.041	0.103	-0.171	86.011	85.881	86.61	0.599
3	4	85.41	85.39	675	16.0	88.42	88.52	N/A	0.15	0.013	326	273	1.022	0.024	0.017	0.017	0.39	0.021	0.038	-0.203	85.881	85.821	86.62	0.739
4	6	85.33	85.27	675	37.0	88.52	88.37	N/A	0.15	0.013	326	290	1.029	0.024	0.044	0.044	0.02	0.001	0.045	-0.179	85.821	85.713	86.72	0.899
5	6	85.82	85.57	375	82.0	88.35	88.35	N/A	0.30	0.013	96	72	0.955	0.029	0.138	0.138	1.33	0.062	0.200	-0.133	86.057	85.713	86.55	0.493
6	7	85.19	85.16	750	22.0	88.37	88.54	N/A	0.15	0.013	431	356	1.093	0.023	0.023	0.023	1.33	0.081	0.103	-0.231	85.713	85.496	86.57	0.857
7	Ex. MH 6559	84.94	84.90	750	24.0	88.60	88.37	N/A	0.15	0.013	431	355	1.096	0.023	0.024	0.024	0.02	0.001	0.026	-0.190	85.496	85.47	86.80	1.304
9	10	85.83	85.50	375	92.5	88.50	88.45	N/A	0.35	0.013	104	89	1.057	0.029	0.238	0.238	1.33	0.076	0.313	-0.108	86.095	85.702	86.70	0.605
10	12	85.28	85.20	600	52.5	88.61	88.32	N/A	0.15	0.013	238	118	0.847	0.025	0.020	0.020	0.02	0.001	0.020	-0.177	85.702	85.682	86.81	1.108
11	12	85.71	85.43	375	94.0	88.34	88.30	N/A	0.30	0.013	96	78	0.975	0.029	0.188	0.188	1.33	0.064	0.252	-0.119	85.963	85.682	86.54	0.577
12	13	85.13	85.04	675	54.5	88.32	88.35	N/A	0.15	0.013	326	212	0.973	0.024	0.035	0.035	0.39	0.019	0.054	-0.118	85.682	85.628	86.52	0.838
13	14	84.98	84.96	675	13.5	88.35	88.42	N/A	0.15	0.013	326	221	0.978	0.024	0.009	0.009	0.39	0.019	0.028	-0.030	85.628	85.600	86.55	0.922
14	18	84.90	84.86	675	26.0	88.42	88.30	N/A	0.15	0.013	326	239	0.999	0.024	0.021	0.021	1.33	0.068	0.089	0.022	85.600	85.511	86.62	1.020
15	16	85.35	85.22	375	44.5	88.28	88.07	N/A	0.30	0.013	96	26	0.743	0.029	0.009	0.009	0.39	0.011	0.020	-0.142	85.583	85.563	86.48	0.897
16	17	85.14	85.11	450	15.5	88.07	88.26	N/A	0.20	0.013	128	33	0.682	0.027	0.002	0.002	0.39	0.009	0.011	-0.028	85.563	85.552	86.27	0.707
17	18	84.96	84.88	600	54.0	88.26	88.30	N/A	0.15	0.013	238	71	0.743	0.025	0.007	0.007	1.19	0.034	0.041	-0.008	85.552	85.511	86.46	0.908
18	Ex. MH 6608	84.80	84.77	675	22.5	88.20	88.04	N/A	0.15	0.013	326	302	1.037	0.024	0.029	0.029	0.035	0.002	0.031	0.032	85.511	85.48	86.40	0.889

Note: 100-year HGL at existing MH 6608 and MH 6559 as modelled in the June 2019 *SWM Report for Summerside South Phase 1*, for which detailed modelling of the Avalon West subdivision was incorporated into the overall model by IBI Group on Sept. 6, 2018, or as per the March 13, 2018 *Avalon West Stage 6 Major System Stormwater Analysis* memo by IBI Group, whichever is higher.

[1] Flow set equal to Rational Method flows (per DSEL) + 14% to account for additional flows captured during the 100-year storm.

[2] USF estimated as 1.8 m below the upstream manhole cover elevation.

Products – StormTech Orifice Plate

Our StormTech Orifice Plate uses a calibrated orifice to control the outflow at a specific rate at a specific head in the catch basin. This is our simplest and most economical Inlet Control Device (ICD), and can be sometimes used by municipalities as a starting point for storm water management until more information is gathered. As with all our products, it can be swapped out with another StormTech ICD once more is known about the system.

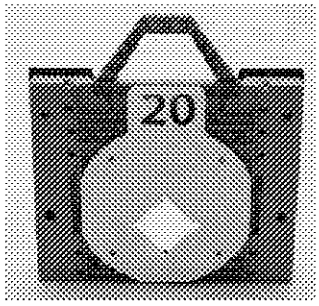
Orifice Plate units can have any shape or size of orifice customized to meet your needs. Standard designs include Round, Diamond, Keyhole and Diamond Keyhole shaped orifices. Keyholes help create a torsional flow pattern through the orifice that can help unblock some debris.

Orifice plate ICD's do not form water traps to prevent odours and are also prone to blockage by floatables like leaves, twigs, bottles and cans, especially during higher rainfall periods. Monitoring of these types of installs is recommended and sometimes leads to recommendations to upgrade to water trap devices, such as Odour Traps and Sumps, to prevent blockage and odours. But in locations where they work properly they are an economical alternative solution.

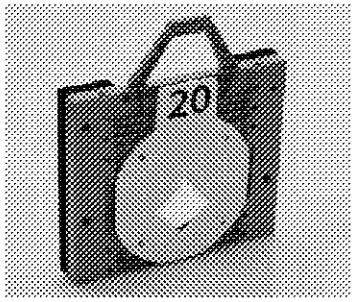
Primary Function(s):	Flow Control for Medium to High Flow Rates (15 to 100 l/s | 237 to 1585 GPM).
Other Functions(s):	None.
Outflow Pipe Diameter:	150 mm to 300 mm | 6 inch to 12 inch. Special orders can be made for larger sizes.
Catch Basin Types:	All – with or without sumps. Rectangular or Round Catch Basins (Round requires built-in adapter that can be provided). Standard Round is 600 mm, but larger sizes available (900 mm, 1200 mm, 1600 mm ...etc.). Fits through even small Catch Basin openings (300 mm x 450 mm).
Specifications:	**Orifice Plate:** HDPE Thermoplastic with UV resistant additives. **Handle Plate (common):** HDPE Thermoplastic. **Handle Plate (common):** HDPE Thermoplastic. **Mounting Plate (common):** HDPE Thermoplastic. **Hardware (common):** Stainless Steel Wedge Bolts with Nut and Washer (4). **Welds:** None. **Inner Ring Seal:** Rubber Bulb Seal EPDM. Held in place and reusable. No need to replace. **Wall Seal:** 3/8 or 5/8 inch Neoprene closed cell sponge gasket attached to Mounting Plate. **Identifier:** 50 mm high numeric's on top of unit. Peel and stick. Note: Not visible from street surface. **Special Tools:** None required. **Weight:** Removable Unit: 0.5 kg / 1 lb. Maximum Total Assembly: 2.3 kg / 5 lb.

Products – StormTech Orifice Plate (continued)

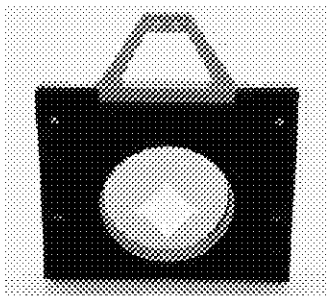
Orifice Plate – Square Adapter (with Diamond Orifice pictured)



Front

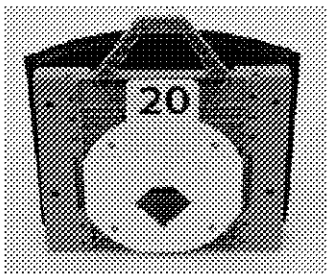


Left Angle

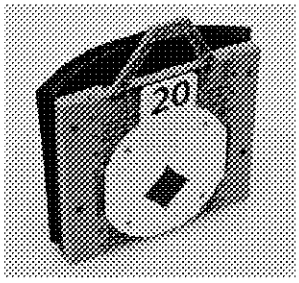


Back – View from Wall

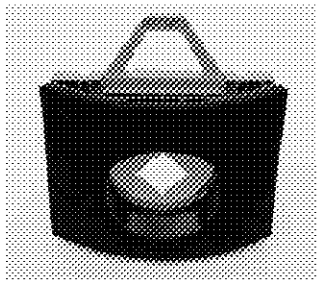
Orifice Plate – Round Adapter



Front



Left Angle



Back – View from Wall

Installation:

1. If necessary, cut protruding out-flowing pipe back flush to Catch Basin wall.
2. Use Mounting Plate as template to mark four hole pattern on Catch Basin wall.
3. Install four Stainless Steel Wedge Bolts (provided) perpendicular to Mounting Plate.
4. Install Mounting Plate and hand secure with four washers and nuts (provided).
5. Torque nuts to 40 N-·m or 30 lbf·ft. Do not over-tighten.
6. Snap unit into place by pushing Handle Plate into dove-tail slot of Mounting Plate.
7. Record Unit Identifier along with Catch Basin Location according to municipal requirements.
8. Note – Unit Identifier with this model is NOT easily seen from street level.

Table B-1: Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD) Capacities [1]

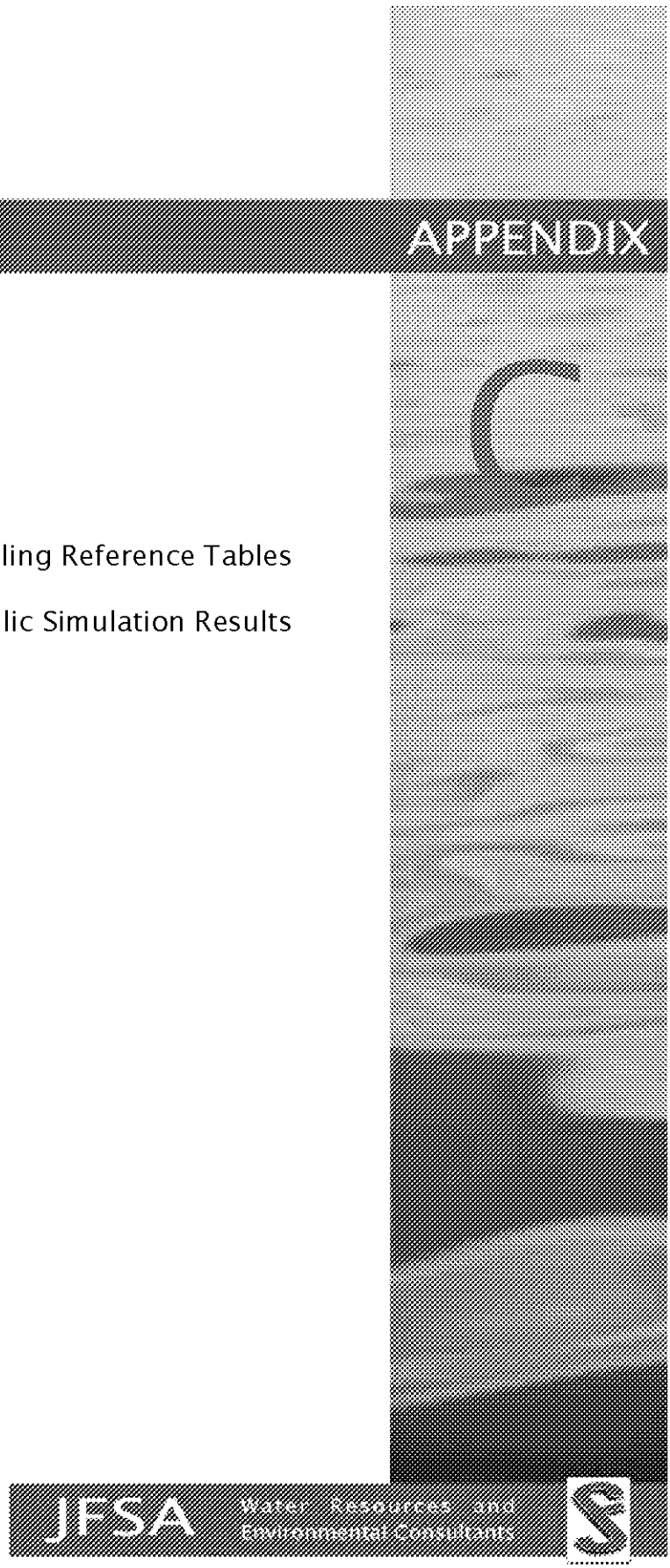
ICD Diameter (mm)	Capture (L/s)							
	CB (1.38 m lead pipe invert depth)				CBMH (1.74 m lead pipe invert depth)			
Water Depth: Head:	*0 cm 1.28 m*	*Average 1.4 m*	*30 cm 1.58 m*	*35 cm 1.63 m*	*0 cm 1.64 m*	*Average 1.76 m*	*30 cm 1.94 m*	*35 cm 1.99 m*
83	17.6	18.4	19.6	19.9	19.9	20.7	21.7	22.0
94	22.6	23.6	25.1	25.5	25.6	26.5	27.8	28.2
102	26.6	27.8	29.6	30.0	30.1	31.2	32.8	33.2
108	29.8	31.2	33.2	33.7	33.8	35.0	36.7	37.2
127	41.3	43.2	45.8	46.6	46.7	48.4	50.8	51.5
152	59.1	61.8	65.7	66.7	66.9	69.3	72.8	73.7
178	81.1	84.8	90.1	91.5	91.8	95.0	99.8	101.1

[1] For circular orifices plate type with diameters as specified by City of Ottawa standards.

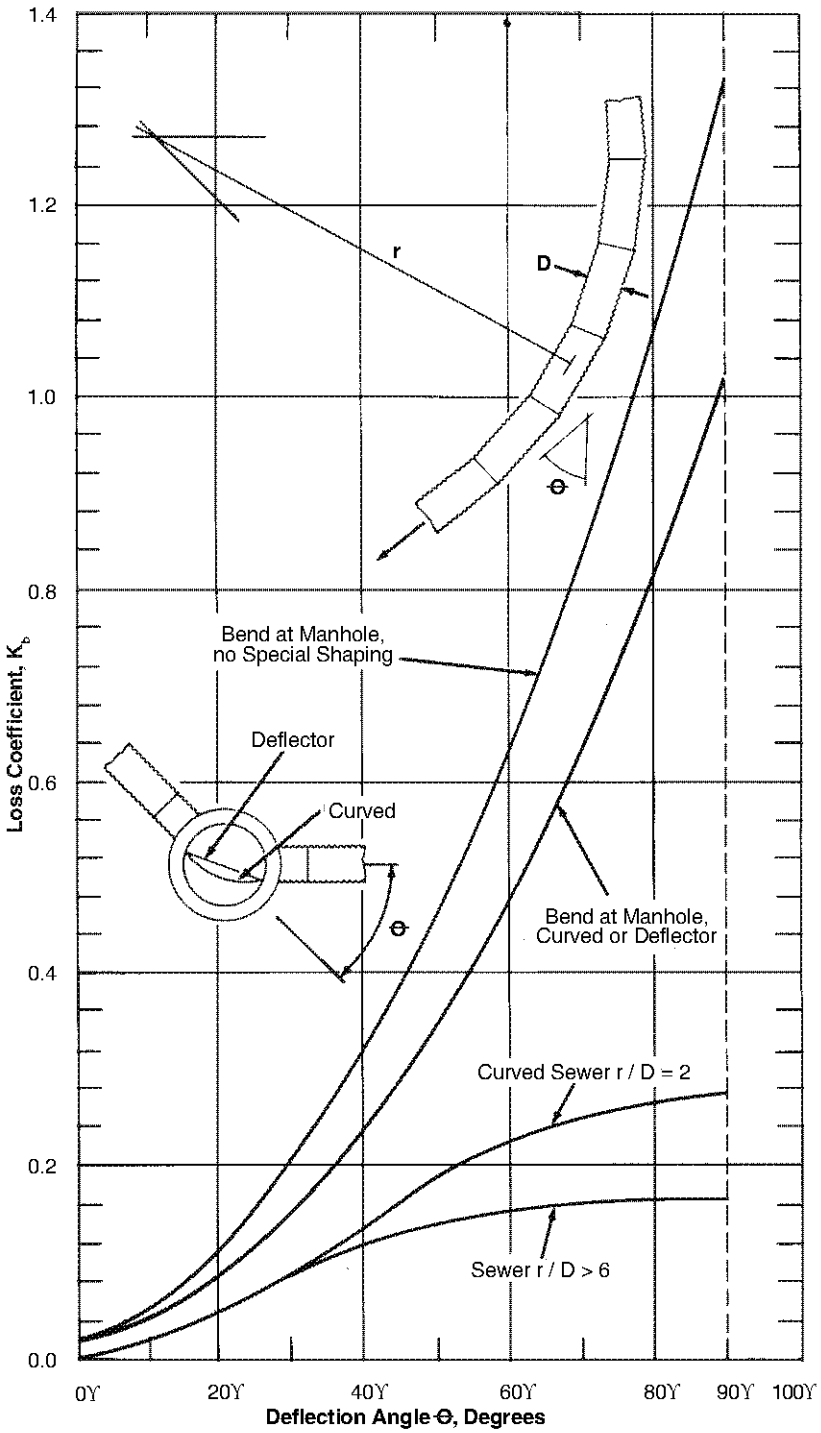
APPENDIX C

Modelling Reference Tables

Pipe Data and Hydraulic Simulation Results



MANHOLE LOSS COEFFICIENT NOMOGRAPH AND TABLE



Angle	Exit Loss
0	0.02
5	0.035
10	0.055
15	0.08
20	0.11
25	0.16
30	0.21
35	0.26
40	0.32
45	0.39
50	0.47
55	0.54
60	0.635
65	0.73
70	0.84
75	0.95
80	1.07
85	1.19
90	1.33

Figure 4.13 Sewer bend loss coefficient[16]

Table C1A: Pipe Data and Hydraulic Simulation Results - 100-Year Chicago 3 Hour Event

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To Peak (hh:mm)	Max HGL U/S (m)	Max HGL D/S (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.35	-0.22	01/01/2019 01:18 AM	85.94	85.91
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.11	0.45	-0.23	01/01/2019 01:11 AM	85.76	85.72
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.11	0.84	-0.08	01/01/2019 01:11 AM	86.09	85.76
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.49	1.13	-0.25	01/01/2019 01:12 AM	85.72	85.61
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.70	-0.13	01/01/2019 01:15 AM	86.26	85.99
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.39	1.04	-0.05	01/01/2019 01:15 AM	85.99	85.72
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.25	0.78	-0.08	01/01/2019 01:15 AM	86.02	85.99
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.19	0.80	-0.08	01/01/2019 01:14 AM	86.05	86.02
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.12	0.95	-0.06	01/01/2019 01:11 AM	85.81	85.58
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.04	0.46	-0.08	01/01/2019 01:14 AM	85.83	85.81
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.44	-0.19	01/01/2019 01:13 AM	85.87	85.83
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.39	1.18	-0.19	01/01/2019 01:11 AM	85.58	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.19	0.96	-0.07	01/01/2019 01:13 AM	85.75	85.58
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.18	0.95	-0.09	01/01/2019 01:12 AM	85.80	85.75
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 01:14 AM	86.10	86.05
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.38	-0.20	01/01/2019 01:17 AM	86.07	85.91
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.18	0.94	-0.11	01/01/2019 01:12 AM	85.91	85.80
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.17	0.79	-0.07	01/01/2019 01:14 AM	86.10	86.05

Table C1B: USF Freeboard Results - 100-Year Chicago 3 Hour Event

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.10	86.05	86.05	1.44
MH-1	MH-2	2-5	86.63	9.0	72.2	86.10	86.05	86.05	0.58
MH-1	MH-2	26-3	87.49	13.1	72.2	86.10	86.05	86.06	1.43
MH-1	MH-2	2-4	86.63	16.6	72.2	86.10	86.05	86.06	0.57
MH-1	MH-2	26-4	87.49	20.7	72.2	86.10	86.05	86.06	1.43
MH-1	MH-2	2-3	86.63	24.2	72.2	86.10	86.05	86.06	0.57
MH-1	MH-2	26-5	87.49	26.9	72.2	86.10	86.05	86.07	1.42
MH-1	MH-2	2-2	86.63	31.8	72.2	86.10	86.05	86.07	0.56
MH-1	MH-2	25-1	87.49	35.1	72.2	86.10	86.05	86.07	1.42
MH-1	MH-2	2-1	86.63	39.5	72.2	86.10	86.05	86.07	0.56
MH-1	MH-2	25-2	87.49	42.7	72.2	86.10	86.05	86.08	1.41
MH-1	MH-2	25-3	87.49	47.5	72.2	86.10	86.05	86.08	1.41
MH-1	MH-2	1-4	86.73	50.5	72.2	86.10	86.05	86.08	0.65
MH-1	MH-2	25-4	87.49	55.1	72.2	86.10	86.05	86.09	1.40
MH-1	MH-2	1-3	86.73	58.1	72.2	86.10	86.05	86.09	0.64
MH-1	MH-2	25-5	87.49	61.3	72.2	86.10	86.05	86.09	1.40
MH-1	MH-2	1-2	86.73	65.7	72.2	86.10	86.05	86.09	0.64
MH-1	MH-2	1-1	86.73	69.7	72.2	86.10	86.05	86.10	0.63
MH-10	MH-12	10-1	86.5	2.3	46.4	85.91	85.80	85.80	0.70
MH-10	MH-12	9-3	86.37	13.2	46.4	85.91	85.80	85.83	0.54
MH-10	MH-12	9-2	86.37	20.9	46.4	85.91	85.80	85.85	0.52
MH-10	MH-12	9-1	86.37	28.5	46.4	85.91	85.80	85.87	0.50
MH-10	MH-12	8-3	86.42	39.5	46.4	85.91	85.80	85.90	0.52
MH-10	MH-12	8-2	86.42	44.4	46.4	85.91	85.80	85.91	0.51
MH-11	MH-10	17-1	86.48	13.0	86.5	86.07	85.91	85.94	0.54
MH-11	MH-10	19-5	86.53	14.1	86.5	86.07	85.91	85.94	0.59
MH-11	MH-10	17-2	86.48	20.6	86.5	86.07	85.91	85.95	0.53
MH-11	MH-10	19-4	86.53	21.7	86.5	86.07	85.91	85.95	0.58
MH-11	MH-10	17-3	86.48	28.2	86.5	86.07	85.91	85.96	0.52
MH-11	MH-10	19-3	86.53	29.3	86.5	86.07	85.91	85.97	0.56
MH-11	MH-10	19-2	86.53	36.9	86.5	86.07	85.91	85.98	0.55
MH-11	MH-10	18-1	86.57	39.2	86.5	86.07	85.91	85.98	0.59
MH-11	MH-10	19-1	86.53	44.5	86.5	86.07	85.91	85.99	0.54
MH-11	MH-10	18-2	86.57	46.8	86.5	86.07	85.91	86.00	0.57
MH-11	MH-10	18-3	86.57	54.4	86.5	86.07	85.91	86.01	0.56
MH-11	MH-10	20-5	86.66	55.5	86.5	86.07	85.91	86.01	0.65
MH-11	MH-10	20-4	86.66	63.1	86.5	86.07	85.91	86.03	0.63
MH-11	MH-10	20-3	86.66	70.8	86.5	86.07	85.91	86.04	0.62
MH-11	MH-10	20-2	86.66	78.4	86.5	86.07	85.91	86.06	0.60
MH-11	MH-10	20-1	86.66	83.6	86.5	86.07	85.91	86.07	0.59
MH-12	MH-13	11-2	86.5	1.2	11.1	85.80	85.75	85.75	0.75
MH-12	MH-13	11-1	86.5	2.5	11.1	85.80	85.75	85.76	0.74
MH-12	MH-13	10-3	86.5	7.1	11.1	85.80	85.75	85.78	0.72
MH-12	MH-13	10-2	86.5	9.4	11.1	85.80	85.75	85.79	0.71
MH-13	MH-14	16-2	86.34	6.4	21.4	85.75	85.58	85.63	0.71
MH-13	MH-14	16-3	86.34	14.0	21.4	85.75	85.58	85.69	0.65
MH-13	MH-14	11-3	86.5	18.6	21.4	85.75	85.58	85.73	0.77
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.83	85.84	0.70
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.83	85.85	0.69
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.83	85.86	0.68
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.83	85.87	0.67
MH-16	MH-17	13-3	86.27	1.2	10.2	85.83	85.81	85.82	0.45
MH-17	MH-14	16-1	86.34	2.3	52.5	85.81	85.58	85.59	0.75
MH-17	MH-14	15-3	86.37	12.2	52.5	85.81	85.58	85.64	0.73
MH-17	MH-14	12-1	86.27	16.0	52.5	85.81	85.58	85.65	0.62
MH-17	MH-14	15-2	86.37	19.8	52.5	85.81	85.58	85.67	0.70
MH-17	MH-14	12-2	86.27	23.6	52.5	85.81	85.58	85.69	0.58
MH-17	MH-14	15-1	86.37	27.4	52.5	85.81	85.58	85.70	0.67
MH-17	MH-14	12-3	86.27	31.2	52.5	85.81	85.58	85.72	0.55
MH-17	MH-14	13-1	86.27	42.2	52.5	85.81	85.58	85.77	0.50
MH-17	MH-14	13-2	86.27	49.8	52.5	85.81	85.58	85.80	0.47
MH-2	MH-3	3-3	86.52	1.5	13.0	86.05	86.02	86.02	0.50
MH-2	MH-3	3-2	86.52	5.5	13.0	86.05	86.02	86.03	0.49
MH-2	MH-3	26-1	87.49	9.6	13.0	86.05	86.02	86.04	1.45
MH-2	MH-3	3-1	86.52	11.8	13.0	86.05	86.02	86.04	0.48
MH-3	MH-4	5-1	86.44	2.0	33.0	86.02	85.99	85.99	0.45
MH-3	MH-4	4-3	86.49	13.0	33.0	86.02	85.99	86.00	0.49
MH-3	MH-4	4-2	86.49	20.6	33.0	86.02	85.99	86.01	0.48
MH-3	MH-4	4-1	86.49	28.2	33.0	86.02	85.99	86.02	0.47
MH-4	MH-6	5-4	86.44	10.6	31.5	85.99	85.72	85.81	0.63
MH-4	MH-6	5-3	86.44	18.2	31.5	85.99	85.72	85.88	0.56
MH-4	MH-6	5-2	86.44	24.5	31.5	85.99	85.72	85.93	0.51
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.99	86.03	1.48
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.99	86.03	1.46
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.99	86.05	1.46
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.99	86.06	1.43
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.99	86.07	1.44
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.99	86.07	1.42
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.99	86.09	1.42

Table C1B: USF Freeboard Results - 100-Year Chicago 3 Hour Event

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.99	86.10	1.39
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.99	86.11	1.40
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.99	86.12	1.37
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.99	86.13	1.38
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.99	86.14	1.35
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.99	86.16	1.35
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.99	86.17	1.32
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.99	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.99	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.99	86.20	1.31
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.99	86.21	1.28
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.99	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.99	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.99	86.24	0.89
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.99	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.09	85.76	85.81	0.74
MH-7	MH-8	23-12	87.51	12.0	88.3	86.09	85.76	85.81	1.70
MH-7	MH-8	23-11	87.51	18.2	88.3	86.09	85.76	85.83	1.68
MH-7	MH-8	22-2	86.55	19.1	88.3	86.09	85.76	85.83	0.72
MH-7	MH-8	23-10	87.51	25.8	88.3	86.09	85.76	85.86	1.65
MH-7	MH-8	22-3	86.55	26.7	88.3	86.09	85.76	85.86	0.69
MH-7	MH-8	23-9	87.51	30.6	88.3	86.09	85.76	85.88	1.63
MH-7	MH-8	22-4	86.55	34.3	88.3	86.09	85.76	85.89	0.66
MH-7	MH-8	23-8	87.51	38.2	88.3	86.09	85.76	85.90	1.61
MH-7	MH-8	22-5	86.55	41.9	88.3	86.09	85.76	85.92	0.63
MH-7	MH-8	23-7	87.51	44.4	88.3	86.09	85.76	85.93	1.58
MH-7	MH-8	24-12	87.51	52.6	88.3	86.09	85.76	85.96	1.55
MH-7	MH-8	21-1	86.55	52.9	88.3	86.09	85.76	85.96	0.59
MH-7	MH-8	24-11	87.51	60.2	88.3	86.09	85.76	85.99	1.52
MH-7	MH-8	21-2	86.55	60.6	88.3	86.09	85.76	85.99	0.56
MH-7	MH-8	24-10	87.51	65.0	88.3	86.09	85.76	86.00	1.51
MH-7	MH-8	21-3	86.55	68.2	88.3	86.09	85.76	86.02	0.53
MH-7	MH-8	24-9	87.51	72.6	88.3	86.09	85.76	86.03	1.48
MH-7	MH-8	21-4	86.55	75.8	88.3	86.09	85.76	86.04	0.51
MH-7	MH-8	24-8	87.13	77.4	88.3	86.09	85.76	86.05	1.08
MH-7	MH-8	21-5	86.55	83.4	88.3	86.09	85.76	86.07	0.48
MH-7	MH-8	24-7	87.13	85.0	88.3	86.09	85.76	86.08	1.05
MH-8	MH-6	6-1	86.6	11.2	12.7	85.76	85.72	85.76	0.84
MH-9	MH-10	8-1	86.42	8.4	56.0	85.94	85.91	85.92	0.50
MH-9	MH-10	7-3	86.49	19.4	56.0	85.94	85.91	85.92	0.57
MH-9	MH-10	7-2	86.49	27.0	56.0	85.94	85.91	85.92	0.57
MH-9	MH-10	7-1	86.49	34.6	56.0	85.94	85.91	85.93	0.56
MH-9	MH-10	6-3	86.6	45.6	56.0	85.94	85.91	85.93	0.67
MH-9	MH-10	6-2	86.6	53.3	56.0	85.94	85.91	85.94	0.66
								Min	0.45
								Max	1.70
								Average	0.88

Table C2A: Pipe Data and Hydraulic Simulation Results - 100-Year SCS 24 Hour Event

U/S MH	D/S MH	U/S Invert Elev (m)	D/S Invert Elev (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n	Design Velocity (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To Peak (hh:mm)	Max U/S HGL (m)	Max D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.35	-0.24	01/01/2019 12:05 PM	85.92	85.89
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.09	0.39	-0.25	01/01/2019 12:00 PM	85.74	85.71
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.09	0.73	-0.12	01/01/2019 12:00 PM	86.05	85.74
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.47	1.08	-0.26	01/01/2019 12:01 PM	85.71	85.60
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.69	-0.13	01/01/2019 12:05 PM	86.26	85.98
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.38	1.00	-0.05	01/01/2019 12:03 PM	85.98	85.71
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.25	0.75	-0.11	01/01/2019 12:03 PM	86.00	85.98
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.18	0.76	-0.10	01/01/2019 12:03 PM	86.03	86.00
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.11	0.83	-0.09	01/01/2019 12:00 PM	85.78	85.57
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.04	0.46	-0.11	01/01/2019 12:05 PM	85.79	85.78
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.44	-0.19	01/01/2019 12:06 PM	85.87	85.79
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.35	1.07	-0.19	01/01/2019 12:00 PM	85.57	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.18	0.91	-0.09	01/01/2019 12:01 PM	85.73	85.57
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.17	0.89	-0.12	01/01/2019 12:01 PM	85.78	85.73
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 12:03 PM	86.09	86.03
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.37	-0.22	01/01/2019 12:06 PM	86.06	85.89
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.17	0.89	-0.13	01/01/2019 12:01 PM	85.89	85.78
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.16	0.74	-0.09	01/01/2019 12:02 PM	86.08	86.03

Table C2B: USF Freeboard Results - 100-Year SCS 24 Hour Event

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.09	86.03	86.03	1.46
MH-1	MH-2	2-5	86.63	9.0	72.2	86.09	86.03	86.03	0.60
MH-1	MH-2	26-3	87.49	13.1	72.2	86.09	86.03	86.04	1.45
MH-1	MH-2	2-4	86.63	16.6	72.2	86.09	86.03	86.04	0.59
MH-1	MH-2	26-4	87.49	20.7	72.2	86.09	86.03	86.04	1.45
MH-1	MH-2	2-3	86.63	24.2	72.2	86.09	86.03	86.05	0.58
MH-1	MH-2	26-5	87.49	26.9	72.2	86.09	86.03	86.05	1.44
MH-1	MH-2	2-2	86.63	31.8	72.2	86.09	86.03	86.05	0.58
MH-1	MH-2	25-1	87.49	35.1	72.2	86.09	86.03	86.06	1.43
MH-1	MH-2	2-1	86.63	39.5	72.2	86.09	86.03	86.06	0.57
MH-1	MH-2	25-2	87.49	42.7	72.2	86.09	86.03	86.06	1.43
MH-1	MH-2	25-3	87.49	47.5	72.2	86.09	86.03	86.07	1.42
MH-1	MH-2	1-4	86.73	50.5	72.2	86.09	86.03	86.07	0.66
MH-1	MH-2	25-4	87.49	55.1	72.2	86.09	86.03	86.07	1.42
MH-1	MH-2	1-3	86.73	58.1	72.2	86.09	86.03	86.08	0.65
MH-1	MH-2	25-5	87.49	61.3	72.2	86.09	86.03	86.08	1.41
MH-1	MH-2	1-2	86.73	65.7	72.2	86.09	86.03	86.08	0.65
MH-1	MH-2	1-1	86.73	69.7	72.2	86.09	86.03	86.09	0.64
MH-10	MH-12	10-1	86.5	2.3	46.4	85.89	85.78	85.78	0.72
MH-10	MH-12	9-3	86.37	13.2	46.4	85.89	85.78	85.81	0.56
MH-10	MH-12	9-2	86.37	20.9	46.4	85.89	85.78	85.83	0.54
MH-10	MH-12	9-1	86.37	28.5	46.4	85.89	85.78	85.85	0.52
MH-10	MH-12	8-3	86.42	39.5	46.4	85.89	85.78	85.88	0.54
MH-10	MH-12	8-2	86.42	44.4	46.4	85.89	85.78	85.89	0.53
MH-11	MH-10	17-1	86.48	13.0	86.5	86.06	85.89	85.92	0.56
MH-11	MH-10	19-5	86.53	14.1	86.5	86.06	85.89	85.92	0.61
MH-11	MH-10	17-2	86.48	20.6	86.5	86.06	85.89	85.93	0.55
MH-11	MH-10	19-4	86.53	21.7	86.5	86.06	85.89	85.93	0.60
MH-11	MH-10	17-3	86.48	28.2	86.5	86.06	85.89	85.95	0.53
MH-11	MH-10	19-3	86.53	29.3	86.5	86.06	85.89	85.95	0.58
MH-11	MH-10	19-2	86.53	36.9	86.5	86.06	85.89	85.96	0.57
MH-11	MH-10	18-1	86.57	39.2	86.5	86.06	85.89	85.97	0.60
MH-11	MH-10	19-1	86.53	44.5	86.5	86.06	85.89	85.98	0.55
MH-11	MH-10	18-2	86.57	46.8	86.5	86.06	85.89	85.98	0.59
MH-11	MH-10	18-3	86.57	54.4	86.5	86.06	85.89	86.00	0.57
MH-11	MH-10	20-5	86.66	55.5	86.5	86.06	85.89	86.00	0.66
MH-11	MH-10	20-4	86.66	63.1	86.5	86.06	85.89	86.02	0.64
MH-11	MH-10	20-3	86.66	70.8	86.5	86.06	85.89	86.03	0.63
MH-11	MH-10	20-2	86.66	78.4	86.5	86.06	85.89	86.05	0.61
MH-11	MH-10	20-1	86.66	83.6	86.5	86.06	85.89	86.06	0.60
MH-12	MH-13	11-2	86.5	1.2	11.1	85.78	85.73	85.73	0.77
MH-12	MH-13	11-1	86.5	2.5	11.1	85.78	85.73	85.74	0.76
MH-12	MH-13	10-3	86.5	7.1	11.1	85.78	85.73	85.76	0.74
MH-12	MH-13	10-2	86.5	9.4	11.1	85.78	85.73	85.77	0.73
MH-13	MH-14	16-2	86.34	6.4	21.4	85.73	85.57	85.62	0.72
MH-13	MH-14	16-3	86.34	14.0	21.4	85.73	85.57	85.67	0.67
MH-13	MH-14	11-3	86.5	18.6	21.4	85.73	85.57	85.71	0.79
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.79	85.81	0.73
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.79	85.83	0.71
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.79	85.85	0.69
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.79	85.87	0.67
MH-16	MH-17	13-3	86.27	1.2	10.2	85.79	85.78	85.78	0.49
MH-17	MH-14	16-1	86.34	2.3	52.5	85.78	85.57	85.58	0.76
MH-17	MH-14	15-3	86.37	12.2	52.5	85.78	85.57	85.62	0.75
MH-17	MH-14	12-1	86.27	16.0	52.5	85.78	85.57	85.64	0.63
MH-17	MH-14	15-2	86.37	19.8	52.5	85.78	85.57	85.65	0.72
MH-17	MH-14	12-2	86.27	23.6	52.5	85.78	85.57	85.67	0.60
MH-17	MH-14	15-1	86.37	27.4	52.5	85.78	85.57	85.68	0.69
MH-17	MH-14	12-3	86.27	31.2	52.5	85.78	85.57	85.70	0.57
MH-17	MH-14	13-1	86.27	42.2	52.5	85.78	85.57	85.74	0.53
MH-17	MH-14	13-2	86.27	49.8	52.5	85.78	85.57	85.77	0.50
MH-2	MH-3	3-3	86.52	1.5	13.0	86.03	86.00	86.00	0.52
MH-2	MH-3	3-2	86.52	5.5	13.0	86.03	86.00	86.01	0.51
MH-2	MH-3	26-1	87.49	9.6	13.0	86.03	86.00	86.02	1.47
MH-2	MH-3	3-1	86.52	11.8	13.0	86.03	86.00	86.02	0.50
MH-3	MH-4	5-1	86.44	2.0	33.0	86.00	85.98	85.98	0.46
MH-3	MH-4	4-3	86.49	13.0	33.0	86.00	85.98	85.99	0.50
MH-3	MH-4	4-2	86.49	20.6	33.0	86.00	85.98	85.99	0.50
MH-3	MH-4	4-1	86.49	28.2	33.0	86.00	85.98	86.00	0.49
MH-4	MH-6	5-4	86.44	10.6	31.5	85.98	85.71	85.80	0.64
MH-4	MH-6	5-3	86.44	18.2	31.5	85.98	85.71	85.87	0.57
MH-4	MH-6	5-2	86.44	24.5	31.5	85.98	85.71	85.92	0.52
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.98	86.02	1.49
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.98	86.03	1.46
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.98	86.04	1.47
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.98	86.05	1.44
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.98	86.06	1.45
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.98	86.07	1.42
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.98	86.08	1.43

Table C2B: USF Freeboard Results - 100-Year SCS 24 Hour Event

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Intersection HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.98	86.09	1.40
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.98	86.10	1.41
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.98	86.11	1.38
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.98	86.13	1.38
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.98	86.14	1.35
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.98	86.15	1.36
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.98	86.17	1.32
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.98	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.98	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.98	86.19	1.32
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.98	86.21	1.28
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.98	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.98	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.98	86.24	0.89
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.98	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.05	85.74	85.78	0.77
MH-7	MH-8	23-12	87.51	12.0	88.3	86.05	85.74	85.78	1.73
MH-7	MH-8	23-11	87.51	18.2	88.3	86.05	85.74	85.81	1.70
MH-7	MH-8	22-2	86.55	19.1	88.3	86.05	85.74	85.81	0.74
MH-7	MH-8	23-10	87.51	25.8	88.3	86.05	85.74	85.83	1.68
MH-7	MH-8	22-3	86.55	26.7	88.3	86.05	85.74	85.84	0.71
MH-7	MH-8	23-9	87.51	30.6	88.3	86.05	85.74	85.85	1.66
MH-7	MH-8	22-4	86.55	34.3	88.3	86.05	85.74	85.86	0.69
MH-7	MH-8	23-8	87.51	38.2	88.3	86.05	85.74	85.88	1.63
MH-7	MH-8	22-5	86.55	41.9	88.3	86.05	85.74	85.89	0.66
MH-7	MH-8	23-7	87.51	44.4	88.3	86.05	85.74	85.90	1.61
MH-7	MH-8	24-12	87.51	52.6	88.3	86.05	85.74	85.93	1.58
MH-7	MH-8	21-1	86.55	52.9	88.3	86.05	85.74	85.93	0.62
MH-7	MH-8	24-11	87.51	60.2	88.3	86.05	85.74	85.95	1.56
MH-7	MH-8	21-2	86.55	60.6	88.3	86.05	85.74	85.95	0.60
MH-7	MH-8	24-10	87.51	65.0	88.3	86.05	85.74	85.97	1.54
MH-7	MH-8	21-3	86.55	68.2	88.3	86.05	85.74	85.98	0.57
MH-7	MH-8	24-9	87.51	72.6	88.3	86.05	85.74	86.00	1.51
MH-7	MH-8	21-4	86.55	75.8	88.3	86.05	85.74	86.01	0.54
MH-7	MH-8	24-8	87.13	77.4	88.3	86.05	85.74	86.01	1.12
MH-7	MH-8	21-5	86.55	83.4	88.3	86.05	85.74	86.03	0.52
MH-7	MH-8	24-7	87.13	85.0	88.3	86.05	85.74	86.04	1.09
MH-8	MH-6	6-1	86.6	11.2	12.7	85.74	85.71	85.74	0.86
MH-9	MH-10	8-1	86.42	8.4	56.0	85.92	85.89	85.90	0.52
MH-9	MH-10	7-3	86.49	19.4	56.0	85.92	85.89	85.90	0.59
MH-9	MH-10	7-2	86.49	27.0	56.0	85.92	85.89	85.90	0.59
MH-9	MH-10	7-1	86.49	34.6	56.0	85.92	85.89	85.91	0.58
MH-9	MH-10	6-3	86.6	45.6	56.0	85.92	85.89	85.91	0.69
MH-9	MH-10	6-2	86.6	53.3	56.0	85.92	85.89	85.92	0.68
								Min	0.46
								Max	1.73
								Average	0.90

Table C3A: Pipe Data and Hydraulic Simulation Results - 1979 Event

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n (-)	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To Peak (h:mm)	Max U/S HGL (m)	Max D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.34	-0.25	01/01/2019 01:38 AM	85.91	85.88
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.08	0.35	-0.27	01/01/2019 01:31 AM	85.72	85.70
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.08	0.66	-0.14	01/01/2019 01:31 AM	86.03	85.72
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.45	1.03	-0.27	01/01/2019 01:32 AM	85.70	85.59
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.69	-0.13	01/01/2019 01:42 AM	86.26	85.96
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.36	0.97	-0.08	01/01/2019 01:33 AM	85.96	85.70
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.24	0.73	-0.13	01/01/2019 01:35 AM	85.98	85.96
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.18	0.73	-0.11	01/01/2019 01:35 AM	86.02	85.98
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.09	0.73	-0.13	01/01/2019 01:31 AM	85.74	85.57
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.04	0.44	-0.14	01/01/2019 01:35 AM	85.76	85.74
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.44	-0.19	01/01/2019 01:42 AM	85.87	85.76
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.32	0.96	-0.19	01/01/2019 01:31 AM	85.57	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.17	0.87	-0.09	01/01/2019 01:32 AM	85.72	85.57
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.16	0.86	-0.13	01/01/2019 01:32 AM	85.77	85.72
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 01:41 AM	86.09	86.02
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.37	-0.22	01/01/2019 01:43 AM	86.06	85.88
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.16	0.85	-0.14	01/01/2019 01:32 AM	85.88	85.77
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.15	0.71	-0.11	01/01/2019 01:33 AM	86.06	86.02

Table C3B: USF Freeboard Results - 1979 Event

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.09	86.02	86.03	1.46
MH-1	MH-2	2-5	86.63	9.0	72.2	86.09	86.02	86.03	0.60
MH-1	MH-2	26-3	87.49	13.1	72.2	86.09	86.02	86.03	1.46
MH-1	MH-2	2-4	86.63	16.6	72.2	86.09	86.02	86.03	0.60
MH-1	MH-2	26-4	87.49	20.7	72.2	86.09	86.02	86.04	1.45
MH-1	MH-2	2-3	86.63	24.2	72.2	86.09	86.02	86.04	0.59
MH-1	MH-2	26-5	87.49	26.9	72.2	86.09	86.02	86.04	1.45
MH-1	MH-2	2-2	86.63	31.8	72.2	86.09	86.02	86.05	0.58
MH-1	MH-2	25-1	87.49	35.1	72.2	86.09	86.02	86.05	1.44
MH-1	MH-2	2-1	86.63	39.5	72.2	86.09	86.02	86.06	0.57
MH-1	MH-2	25-2	87.49	42.7	72.2	86.09	86.02	86.06	1.43
MH-1	MH-2	25-3	87.49	47.5	72.2	86.09	86.02	86.06	1.43
MH-1	MH-2	1-4	86.73	50.5	72.2	86.09	86.02	86.07	0.66
MH-1	MH-2	25-4	87.49	55.1	72.2	86.09	86.02	86.07	1.42
MH-1	MH-2	1-3	86.73	58.1	72.2	86.09	86.02	86.07	0.66
MH-1	MH-2	25-5	87.49	61.3	72.2	86.09	86.02	86.08	1.41
MH-1	MH-2	1-2	86.73	65.7	72.2	86.09	86.02	86.08	0.65
MH-1	MH-2	1-1	86.73	69.7	72.2	86.09	86.02	86.09	0.64
MH-10	MH-12	10-1	86.5	2.3	46.4	85.88	85.77	85.77	0.73
MH-10	MH-12	9-3	86.37	13.2	46.4	85.88	85.77	85.80	0.57
MH-10	MH-12	9-2	86.37	20.9	46.4	85.88	85.77	85.82	0.55
MH-10	MH-12	9-1	86.37	28.5	46.4	85.88	85.77	85.84	0.53
MH-10	MH-12	8-3	86.42	39.5	46.4	85.88	85.77	85.87	0.55
MH-10	MH-12	8-2	86.42	44.4	46.4	85.88	85.77	85.88	0.54
MH-11	MH-10	17-1	86.48	13.0	86.5	86.06	85.88	85.91	0.57
MH-11	MH-10	19-5	86.53	14.1	86.5	86.06	85.88	85.91	0.62
MH-11	MH-10	17-2	86.48	20.6	86.5	86.06	85.88	85.92	0.56
MH-11	MH-10	19-4	86.53	21.7	86.5	86.06	85.88	85.93	0.60
MH-11	MH-10	17-3	86.48	28.2	86.5	86.06	85.88	85.94	0.54
MH-11	MH-10	19-3	86.53	29.3	86.5	86.06	85.88	85.94	0.59
MH-11	MH-10	19-2	86.53	36.9	86.5	86.06	85.88	85.96	0.57
MH-11	MH-10	18-1	86.57	39.2	86.5	86.06	85.88	85.96	0.61
MH-11	MH-10	19-1	86.53	44.5	86.5	86.06	85.88	85.97	0.56
MH-11	MH-10	18-2	86.57	46.8	86.5	86.06	85.88	85.98	0.59
MH-11	MH-10	18-3	86.57	54.4	86.5	86.06	85.88	86.00	0.57
MH-11	MH-10	20-5	86.66	55.5	86.5	86.06	85.88	86.00	0.66
MH-11	MH-10	20-4	86.66	63.1	86.5	86.06	85.88	86.01	0.65
MH-11	MH-10	20-3	86.66	70.8	86.5	86.06	85.88	86.03	0.63
MH-11	MH-10	20-2	86.66	78.4	86.5	86.06	85.88	86.05	0.61
MH-11	MH-10	20-1	86.66	83.6	86.5	86.06	85.88	86.06	0.60
MH-12	MH-13	11-2	86.5	1.2	11.1	85.77	85.72	85.72	0.78
MH-12	MH-13	11-1	86.5	2.5	11.1	85.77	85.72	85.73	0.77
MH-12	MH-13	10-3	86.5	7.1	11.1	85.77	85.72	85.75	0.75
MH-12	MH-13	10-2	86.5	9.4	11.1	85.77	85.72	85.76	0.74
MH-13	MH-14	16-2	86.34	6.4	21.4	85.72	85.57	85.62	0.72
MH-13	MH-14	16-3	86.34	14.0	21.4	85.72	85.57	85.67	0.67
MH-13	MH-14	11-3	86.5	18.6	21.4	85.72	85.57	85.70	0.80
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.76	85.79	0.75
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.76	85.81	0.73
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.76	85.84	0.70
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.76	85.86	0.68
MH-16	MH-17	13-3	86.27	1.2	10.2	85.76	85.74	85.75	0.52
MH-17	MH-14	16-1	86.34	2.3	52.5	85.74	85.57	85.58	0.76
MH-17	MH-14	15-3	86.37	12.2	52.5	85.74	85.57	85.61	0.76
MH-17	MH-14	12-1	86.27	16.0	52.5	85.74	85.57	85.63	0.64
MH-17	MH-14	15-2	86.37	19.8	52.5	85.74	85.57	85.64	0.73
MH-17	MH-14	12-2	86.27	23.6	52.5	85.74	85.57	85.65	0.62
MH-17	MH-14	15-1	86.37	27.4	52.5	85.74	85.57	85.66	0.71
MH-17	MH-14	12-3	86.27	31.2	52.5	85.74	85.57	85.67	0.60
MH-17	MH-14	13-1	86.27	42.2	52.5	85.74	85.57	85.71	0.56
MH-17	MH-14	13-2	86.27	49.8	52.5	85.74	85.57	85.74	0.53
MH-2	MH-3	3-3	86.52	1.5	13.0	86.02	85.98	85.99	0.53
MH-2	MH-3	3-2	86.52	5.5	13.0	86.02	85.98	86.00	0.52
MH-2	MH-3	26-1	87.49	9.6	13.0	86.02	85.98	86.01	1.48
MH-2	MH-3	3-1	86.52	11.8	13.0	86.02	85.98	86.01	0.51
MH-3	MH-4	5-1	86.44	2.0	33.0	85.98	85.96	85.96	0.48
MH-3	MH-4	4-3	86.49	13.0	33.0	85.98	85.96	85.97	0.52
MH-3	MH-4	4-2	86.49	20.6	33.0	85.98	85.96	85.97	0.52
MH-3	MH-4	4-1	86.49	28.2	33.0	85.98	85.96	85.98	0.51
MH-4	MH-6	5-4	86.44	10.6	31.5	85.96	85.70	85.79	0.65
MH-4	MH-6	5-3	86.44	18.2	31.5	85.96	85.70	85.85	0.59
MH-4	MH-6	5-2	86.44	24.5	31.5	85.96	85.70	85.90	0.54
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.96	86.00	1.51
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.96	86.01	1.48
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.96	86.02	1.49
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.96	86.04	1.45
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.96	86.05	1.46
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.96	86.05	1.44
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.96	86.07	1.44

Table C3B: USF Freeboard Results - 1979 Event

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.96	86.08	1.41
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.96	86.09	1.42
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.96	86.10	1.39
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.96	86.12	1.39
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.96	86.13	1.36
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.96	86.14	1.37
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.96	86.16	1.33
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.96	86.17	1.34
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.96	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.96	86.19	1.32
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.96	86.20	1.29
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.96	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.96	86.22	1.27
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.96	86.23	0.90
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.96	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.03	85.72	85.76	0.79
MH-7	MH-8	23-12	87.51	12.0	88.3	86.03	85.72	85.76	1.75
MH-7	MH-8	23-11	87.51	18.2	88.3	86.03	85.72	85.79	1.72
MH-7	MH-8	22-2	86.55	19.1	88.3	86.03	85.72	85.79	0.76
MH-7	MH-8	23-10	87.51	25.8	88.3	86.03	85.72	85.81	1.70
MH-7	MH-8	22-3	86.55	26.7	88.3	86.03	85.72	85.82	0.73
MH-7	MH-8	23-9	87.51	30.6	88.3	86.03	85.72	85.83	1.68
MH-7	MH-8	22-4	86.55	34.3	88.3	86.03	85.72	85.84	0.71
MH-7	MH-8	23-8	87.51	38.2	88.3	86.03	85.72	85.86	1.65
MH-7	MH-8	22-5	86.55	41.9	88.3	86.03	85.72	85.87	0.68
MH-7	MH-8	23-7	87.51	44.4	88.3	86.03	85.72	85.88	1.63
MH-7	MH-8	24-12	87.51	52.6	88.3	86.03	85.72	85.91	1.60
MH-7	MH-8	21-1	86.55	52.9	88.3	86.03	85.72	85.91	0.64
MH-7	MH-8	24-11	87.51	60.2	88.3	86.03	85.72	85.93	1.58
MH-7	MH-8	21-2	86.55	60.6	88.3	86.03	85.72	85.93	0.62
MH-7	MH-8	24-10	87.51	65.0	88.3	86.03	85.72	85.95	1.56
MH-7	MH-8	21-3	86.55	68.2	88.3	86.03	85.72	85.96	0.59
MH-7	MH-8	24-9	87.51	72.6	88.3	86.03	85.72	85.98	1.53
MH-7	MH-8	21-4	86.55	75.8	88.3	86.03	85.72	85.99	0.56
MH-7	MH-8	24-8	87.13	77.4	88.3	86.03	85.72	85.99	1.14
MH-7	MH-8	21-5	86.55	83.4	88.3	86.03	85.72	86.01	0.54
MH-7	MH-8	24-7	87.13	85.0	88.3	86.03	85.72	86.02	1.11
MH-8	MH-6	6-1	86.6	11.2	12.7	85.72	85.70	85.72	0.88
MH-9	MH-10	8-1	86.42	8.4	56.0	85.91	85.88	85.89	0.53
MH-9	MH-10	7-3	86.49	19.4	56.0	85.91	85.88	85.89	0.60
MH-9	MH-10	7-2	86.49	27.0	56.0	85.91	85.88	85.89	0.60
MH-9	MH-10	7-1	86.49	34.6	56.0	85.91	85.88	85.90	0.59
MH-9	MH-10	6-3	86.6	45.6	56.0	85.91	85.88	85.90	0.70
MH-9	MH-10	6-2	86.6	53.3	56.0	85.91	85.88	85.91	0.69
								Min	0.48
								Max	1.75
								Average	0.91

Table C4A: Pipe Data and Hydraulic Simulation Results - 1988 Event

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n (-)	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To Peak (hh:mm)	Max U/S HGL (m)	Max D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.35	-0.25	01/01/2019 02:07 AM	85.91	85.88
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.09	0.39	-0.25	01/01/2019 02:02 AM	85.74	85.70
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.09	0.72	-0.12	01/01/2019 02:02 AM	86.05	85.74
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.47	1.09	-0.27	01/01/2019 02:02 AM	85.70	85.60
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.68	-0.13	01/01/2019 02:04 AM	86.26	85.97
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.37	0.98	-0.06	01/01/2019 02:03 AM	85.97	85.70
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.24	0.73	-0.11	01/01/2019 02:05 AM	85.99	85.97
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.18	0.74	-0.11	01/01/2019 02:04 AM	86.02	85.99
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.11	0.82	-0.10	01/01/2019 02:02 AM	85.77	85.57
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.05	0.47	-0.11	01/01/2019 02:05 AM	85.79	85.77
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.44	-0.19	01/01/2019 02:05 AM	85.87	85.79
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.33	1.01	-0.19	01/01/2019 02:01 AM	85.57	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.17	0.87	-0.09	01/01/2019 02:02 AM	85.72	85.57
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.16	0.85	-0.13	01/01/2019 02:03 AM	85.77	85.72
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 02:04 AM	86.09	86.02
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.37	-0.22	01/01/2019 02:04 AM	86.06	85.88
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.16	0.85	-0.14	01/01/2019 02:03 AM	85.88	85.77
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.16	0.72	-0.09	01/01/2019 02:02 AM	86.07	86.02

Table C4B: USF Freeboard Results - 1988

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Intermish HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.09	86.02	86.03	1.46
MH-1	MH-2	2-5	86.63	9.0	72.2	86.09	86.02	86.03	0.60
MH-1	MH-2	26-3	87.49	13.1	72.2	86.09	86.02	86.03	1.46
MH-1	MH-2	2-4	86.63	16.6	72.2	86.09	86.02	86.03	0.60
MH-1	MH-2	26-4	87.49	20.7	72.2	86.09	86.02	86.04	1.45
MH-1	MH-2	2-3	86.63	24.2	72.2	86.09	86.02	86.04	0.59
MH-1	MH-2	26-5	87.49	26.9	72.2	86.09	86.02	86.04	1.45
MH-1	MH-2	2-2	86.63	31.8	72.2	86.09	86.02	86.05	0.58
MH-1	MH-2	25-1	87.49	35.1	72.2	86.09	86.02	86.05	1.44
MH-1	MH-2	2-1	86.63	39.5	72.2	86.09	86.02	86.06	0.57
MH-1	MH-2	25-2	87.49	42.7	72.2	86.09	86.02	86.06	1.43
MH-1	MH-2	25-3	87.49	47.5	72.2	86.09	86.02	86.06	1.43
MH-1	MH-2	1-4	86.73	50.5	72.2	86.09	86.02	86.07	0.66
MH-1	MH-2	25-4	87.49	55.1	72.2	86.09	86.02	86.07	1.42
MH-1	MH-2	1-3	86.73	58.1	72.2	86.09	86.02	86.07	0.66
MH-1	MH-2	25-5	87.49	61.3	72.2	86.09	86.02	86.08	1.41
MH-1	MH-2	1-2	86.73	65.7	72.2	86.09	86.02	86.08	0.65
MH-1	MH-2	1-1	86.73	69.7	72.2	86.09	86.02	86.09	0.64
MH-10	MH-12	10-1	86.5	2.3	46.4	85.88	85.77	85.77	0.73
MH-10	MH-12	9-3	86.37	13.2	46.4	85.88	85.77	85.80	0.57
MH-10	MH-12	9-2	86.37	20.9	46.4	85.88	85.77	85.82	0.55
MH-10	MH-12	9-1	86.37	28.5	46.4	85.88	85.77	85.84	0.53
MH-10	MH-12	8-3	86.42	39.5	46.4	85.88	85.77	85.87	0.55
MH-10	MH-12	8-2	86.42	44.4	46.4	85.88	85.77	85.88	0.54
MH-11	MH-10	17-1	86.48	13.0	86.5	86.06	85.88	85.91	0.57
MH-11	MH-10	19-5	86.53	14.1	86.5	86.06	85.88	85.91	0.62
MH-11	MH-10	17-2	86.48	20.6	86.5	86.06	85.88	85.92	0.56
MH-11	MH-10	19-4	86.53	21.7	86.5	86.06	85.88	85.93	0.60
MH-11	MH-10	17-3	86.48	28.2	86.5	86.06	85.88	85.94	0.54
MH-11	MH-10	19-3	86.53	29.3	86.5	86.06	85.88	85.94	0.59
MH-11	MH-10	19-2	86.53	36.9	86.5	86.06	85.88	85.96	0.57
MH-11	MH-10	18-1	86.57	39.2	86.5	86.06	85.88	85.96	0.61
MH-11	MH-10	19-1	86.53	44.5	86.5	86.06	85.88	85.97	0.56
MH-11	MH-10	18-2	86.57	46.8	86.5	86.06	85.88	85.98	0.59
MH-11	MH-10	18-3	86.57	54.4	86.5	86.06	85.88	86.00	0.57
MH-11	MH-10	20-5	86.66	55.5	86.5	86.06	85.88	86.00	0.66
MH-11	MH-10	20-4	86.66	63.1	86.5	86.06	85.88	86.01	0.65
MH-11	MH-10	20-3	86.66	70.8	86.5	86.06	85.88	86.03	0.63
MH-11	MH-10	20-2	86.66	78.4	86.5	86.06	85.88	86.05	0.61
MH-11	MH-10	20-1	86.66	83.6	86.5	86.06	85.88	86.06	0.60
MH-12	MH-13	11-2	86.5	1.2	11.1	85.77	85.72	85.72	0.78
MH-12	MH-13	11-1	86.5	2.5	11.1	85.77	85.72	85.73	0.77
MH-12	MH-13	10-3	86.5	7.1	11.1	85.77	85.72	85.75	0.75
MH-12	MH-13	10-2	86.5	9.4	11.1	85.77	85.72	85.76	0.74
MH-13	MH-14	16-2	86.34	6.4	21.4	85.72	85.57	85.62	0.72
MH-13	MH-14	16-3	86.34	14.0	21.4	85.72	85.57	85.67	0.67
MH-13	MH-14	11-3	86.5	18.6	21.4	85.72	85.57	85.70	0.80
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.79	85.81	0.73
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.79	85.83	0.71
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.79	85.85	0.69
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.79	85.87	0.67
MH-16	MH-17	13-3	86.27	1.2	10.2	85.79	85.77	85.78	0.49
MH-17	MH-14	16-1	86.34	2.3	52.5	85.77	85.57	85.58	0.76
MH-17	MH-14	15-3	86.37	12.2	52.5	85.77	85.57	85.62	0.75
MH-17	MH-14	12-1	86.27	16.0	52.5	85.77	85.57	85.63	0.64
MH-17	MH-14	15-2	86.37	19.8	52.5	85.77	85.57	85.65	0.72
MH-17	MH-14	12-2	86.27	23.6	52.5	85.77	85.57	85.66	0.61
MH-17	MH-14	15-1	86.37	27.4	52.5	85.77	85.57	85.68	0.69
MH-17	MH-14	12-3	86.27	31.2	52.5	85.77	85.57	85.69	0.58
MH-17	MH-14	13-1	86.27	42.2	52.5	85.77	85.57	85.73	0.54
MH-17	MH-14	13-2	86.27	49.8	52.5	85.77	85.57	85.76	0.51
MH-2	MH-3	3-3	86.52	1.5	13.0	86.02	85.99	85.99	0.53
MH-2	MH-3	3-2	86.52	5.5	13.0	86.02	85.99	86.00	0.52
MH-2	MH-3	26-1	87.49	9.6	13.0	86.02	85.99	86.01	1.48
MH-2	MH-3	3-1	86.52	11.8	13.0	86.02	85.99	86.01	0.51
MH-3	MH-4	5-1	86.44	2.0	33.0	85.99	85.97	85.97	0.47
MH-3	MH-4	4-3	86.49	13.0	33.0	85.99	85.97	85.98	0.51
MH-3	MH-4	4-2	86.49	20.6	33.0	85.99	85.97	85.98	0.51
MH-3	MH-4	4-1	86.49	28.2	33.0	85.99	85.97	85.99	0.50
MH-4	MH-6	5-4	86.44	10.6	31.5	85.97	85.70	85.79	0.65
MH-4	MH-6	5-3	86.44	18.2	31.5	85.97	85.70	85.86	0.58
MH-4	MH-6	5-2	86.44	24.5	31.5	85.97	85.70	85.91	0.53
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.97	86.01	1.50
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.97	86.02	1.47
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.97	86.03	1.48
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.97	86.04	1.45
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.97	86.06	1.45
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.97	86.06	1.43
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.97	86.07	1.44

Table C4B: USF Freeboard Results - 1988

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.97	86.09	1.40
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.97	86.10	1.41
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.97	86.11	1.38
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.97	86.12	1.39
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.97	86.14	1.35
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.97	86.15	1.36
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.97	86.16	1.33
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.97	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.97	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.97	86.19	1.32
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.97	86.20	1.29
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.97	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.97	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.97	86.23	0.90
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.97	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.05	85.74	85.78	0.77
MH-7	MH-8	23-12	87.51	12.0	88.3	86.05	85.74	85.78	1.73
MH-7	MH-8	23-11	87.51	18.2	88.3	86.05	85.74	85.81	1.70
MH-7	MH-8	22-2	86.55	19.1	88.3	86.05	85.74	85.81	0.74
MH-7	MH-8	23-10	87.51	25.8	88.3	86.05	85.74	85.83	1.68
MH-7	MH-8	22-3	86.55	26.7	88.3	86.05	85.74	85.84	0.71
MH-7	MH-8	23-9	87.51	30.6	88.3	86.05	85.74	85.85	1.66
MH-7	MH-8	22-4	86.55	34.3	88.3	86.05	85.74	85.86	0.69
MH-7	MH-8	23-8	87.51	38.2	88.3	86.05	85.74	85.88	1.63
MH-7	MH-8	22-5	86.55	41.9	88.3	86.05	85.74	85.89	0.66
MH-7	MH-8	23-7	87.51	44.4	88.3	86.05	85.74	85.90	1.61
MH-7	MH-8	24-12	87.51	52.6	88.3	86.05	85.74	85.93	1.58
MH-7	MH-8	21-1	86.55	52.9	88.3	86.05	85.74	85.93	0.62
MH-7	MH-8	24-11	87.51	60.2	88.3	86.05	85.74	85.95	1.56
MH-7	MH-8	21-2	86.55	60.6	88.3	86.05	85.74	85.95	0.60
MH-7	MH-8	24-10	87.51	65.0	88.3	86.05	85.74	85.97	1.54
MH-7	MH-8	21-3	86.55	68.2	88.3	86.05	85.74	85.98	0.57
MH-7	MH-8	24-9	87.51	72.6	88.3	86.05	85.74	86.00	1.51
MH-7	MH-8	21-4	86.55	75.8	88.3	86.05	85.74	86.01	0.54
MH-7	MH-8	24-8	87.13	77.4	88.3	86.05	85.74	86.01	1.12
MH-7	MH-8	21-5	86.55	83.4	88.3	86.05	85.74	86.03	0.52
MH-7	MH-8	24-7	87.13	85.0	88.3	86.05	85.74	86.04	1.09
MH-8	MH-6	6-1	86.6	11.2	12.7	85.74	85.70	85.74	0.86
MH-9	MH-10	8-1	86.42	8.4	56.0	85.91	85.88	85.89	0.53
MH-9	MH-10	7-3	86.49	19.4	56.0	85.91	85.88	85.89	0.60
MH-9	MH-10	7-2	86.49	27.0	56.0	85.91	85.88	85.89	0.60
MH-9	MH-10	7-1	86.49	34.6	56.0	85.91	85.88	85.90	0.59
MH-9	MH-10	6-3	86.6	45.6	56.0	85.91	85.88	85.90	0.70
MH-9	MH-10	6-2	86.6	53.3	56.0	85.91	85.88	85.91	0.69
								Min	0.47
								Max	1.73
								Average	0.91

Table C5A: Pipe Data and Hydraulic Simulation Results - 1996 Event

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n (-)	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To Peak (hh:mm)	Max U/S HGL (m)	Max D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.34	-0.25	01/01/2019 01:34 AM	85.91	85.87
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.08	0.34	-0.27	01/01/2019 01:29 AM	85.72	85.69
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.08	0.64	-0.15	01/01/2019 01:29 AM	86.02	85.72
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.43	1.00	-0.28	01/01/2019 01:30 AM	85.69	85.58
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.67	-0.14	01/01/2019 01:33 AM	86.25	85.95
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.35	0.94	-0.08	01/01/2019 01:31 AM	85.95	85.69
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.23	0.72	-0.13	01/01/2019 01:32 AM	85.97	85.95
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.17	0.72	-0.12	01/01/2019 01:32 AM	86.01	85.97
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.09	0.69	-0.14	01/01/2019 01:28 AM	85.73	85.57
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.04	0.45	-0.16	01/01/2019 01:33 AM	85.75	85.73
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.43	-0.19	01/01/2019 01:33 AM	85.87	85.75
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.30	0.92	-0.19	01/01/2019 01:30 AM	85.57	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.17	0.86	-0.11	01/01/2019 01:31 AM	85.71	85.57
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.16	0.84	-0.14	01/01/2019 01:31 AM	85.76	85.71
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.23	-0.25	01/01/2019 01:32 AM	86.09	86.01
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.36	-0.22	01/01/2019 01:32 AM	86.06	85.87
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.16	0.84	-0.15	01/01/2019 01:31 AM	85.87	85.76
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.15	0.70	-0.12	01/01/2019 01:30 AM	86.05	86.01

Table C5B: USF Freeboard Results - 1996 Event

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Intermish HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.09	86.01	86.02	1.47
MH-1	MH-2	2-5	86.63	9.0	72.2	86.09	86.01	86.02	0.61
MH-1	MH-2	26-3	87.49	13.1	72.2	86.09	86.01	86.02	1.47
MH-1	MH-2	2-4	86.63	16.6	72.2	86.09	86.01	86.03	0.60
MH-1	MH-2	26-4	87.49	20.7	72.2	86.09	86.01	86.03	1.46
MH-1	MH-2	2-3	86.63	24.2	72.2	86.09	86.01	86.03	0.60
MH-1	MH-2	26-5	87.49	26.9	72.2	86.09	86.01	86.04	1.45
MH-1	MH-2	2-2	86.63	31.8	72.2	86.09	86.01	86.04	0.59
MH-1	MH-2	25-1	87.49	35.1	72.2	86.09	86.01	86.05	1.44
MH-1	MH-2	2-1	86.63	39.5	72.2	86.09	86.01	86.05	0.58
MH-1	MH-2	25-2	87.49	42.7	72.2	86.09	86.01	86.05	1.44
MH-1	MH-2	25-3	87.49	47.5	72.2	86.09	86.01	86.06	1.43
MH-1	MH-2	1-4	86.73	50.5	72.2	86.09	86.01	86.06	0.67
MH-1	MH-2	25-4	87.49	55.1	72.2	86.09	86.01	86.07	1.42
MH-1	MH-2	1-3	86.73	58.1	72.2	86.09	86.01	86.07	0.66
MH-1	MH-2	25-5	87.49	61.3	72.2	86.09	86.01	86.08	1.41
MH-1	MH-2	1-2	86.73	65.7	72.2	86.09	86.01	86.08	0.65
MH-1	MH-2	1-1	86.73	69.7	72.2	86.09	86.01	86.09	0.64
MH-10	MH-12	10-1	86.5	2.3	46.4	85.87	85.76	85.76	0.74
MH-10	MH-12	9-3	86.37	13.2	46.4	85.87	85.76	85.79	0.58
MH-10	MH-12	9-2	86.37	20.9	46.4	85.87	85.76	85.81	0.56
MH-10	MH-12	9-1	86.37	28.5	46.4	85.87	85.76	85.83	0.54
MH-10	MH-12	8-3	86.42	39.5	46.4	85.87	85.76	85.86	0.56
MH-10	MH-12	8-2	86.42	44.4	46.4	85.87	85.76	85.87	0.55
MH-11	MH-10	17-1	86.48	13.0	86.5	86.06	85.87	85.90	0.58
MH-11	MH-10	19-5	86.53	14.1	86.5	86.06	85.87	85.90	0.63
MH-11	MH-10	17-2	86.48	20.6	86.5	86.06	85.87	85.92	0.56
MH-11	MH-10	19-4	86.53	21.7	86.5	86.06	85.87	85.92	0.61
MH-11	MH-10	17-3	86.48	28.2	86.5	86.06	85.87	85.93	0.55
MH-11	MH-10	19-3	86.53	29.3	86.5	86.06	85.87	85.94	0.59
MH-11	MH-10	19-2	86.53	36.9	86.5	86.06	85.87	85.95	0.58
MH-11	MH-10	18-1	86.57	39.2	86.5	86.06	85.87	85.96	0.61
MH-11	MH-10	19-1	86.53	44.5	86.5	86.06	85.87	85.97	0.56
MH-11	MH-10	18-2	86.57	46.8	86.5	86.06	85.87	85.97	0.60
MH-11	MH-10	18-3	86.57	54.4	86.5	86.06	85.87	85.99	0.58
MH-11	MH-10	20-5	86.66	55.5	86.5	86.06	85.87	85.99	0.67
MH-11	MH-10	20-4	86.66	63.1	86.5	86.06	85.87	86.01	0.65
MH-11	MH-10	20-3	86.66	70.8	86.5	86.06	85.87	86.03	0.63
MH-11	MH-10	20-2	86.66	78.4	86.5	86.06	85.87	86.04	0.62
MH-11	MH-10	20-1	86.66	83.6	86.5	86.06	85.87	86.06	0.60
MH-12	MH-13	11-2	86.5	1.2	11.1	85.76	85.71	85.71	0.79
MH-12	MH-13	11-1	86.5	2.5	11.1	85.76	85.71	85.72	0.78
MH-12	MH-13	10-3	86.5	7.1	11.1	85.76	85.71	85.74	0.76
MH-12	MH-13	10-2	86.5	9.4	11.1	85.76	85.71	85.75	0.75
MH-13	MH-14	16-2	86.34	6.4	21.4	85.71	85.57	85.61	0.73
MH-13	MH-14	16-3	86.34	14.0	21.4	85.71	85.57	85.66	0.68
MH-13	MH-14	11-3	86.5	18.6	21.4	85.71	85.57	85.69	0.81
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.75	85.78	0.76
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.75	85.81	0.73
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.75	85.84	0.70
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.75	85.86	0.68
MH-16	MH-17	13-3	86.27	1.2	10.2	85.75	85.73	85.74	0.53
MH-17	MH-14	16-1	86.34	2.3	52.5	85.73	85.57	85.58	0.76
MH-17	MH-14	15-3	86.37	12.2	52.5	85.73	85.57	85.61	0.76
MH-17	MH-14	12-1	86.27	16.0	52.5	85.73	85.57	85.62	0.65
MH-17	MH-14	15-2	86.37	19.8	52.5	85.73	85.57	85.63	0.74
MH-17	MH-14	12-2	86.27	23.6	52.5	85.73	85.57	85.65	0.62
MH-17	MH-14	15-1	86.37	27.4	52.5	85.73	85.57	85.66	0.71
MH-17	MH-14	12-3	86.27	31.2	52.5	85.73	85.57	85.67	0.60
MH-17	MH-14	13-1	86.27	42.2	52.5	85.73	85.57	85.70	0.57
MH-17	MH-14	13-2	86.27	49.8	52.5	85.73	85.57	85.73	0.54
MH-2	MH-3	3-3	86.52	1.5	13.0	86.01	85.97	85.98	0.54
MH-2	MH-3	3-2	86.52	5.5	13.0	86.01	85.97	85.99	0.53
MH-2	MH-3	26-1	87.49	9.6	13.0	86.01	85.97	86.00	1.49
MH-2	MH-3	3-1	86.52	11.8	13.0	86.01	85.97	86.00	0.52
MH-3	MH-4	5-1	86.44	2.0	33.0	85.97	85.95	85.95	0.49
MH-3	MH-4	4-3	86.49	13.0	33.0	85.97	85.95	85.96	0.53
MH-3	MH-4	4-2	86.49	20.6	33.0	85.97	85.95	85.96	0.53
MH-3	MH-4	4-1	86.49	28.2	33.0	85.97	85.95	85.97	0.52
MH-4	MH-6	5-4	86.44	10.6	31.5	85.95	85.69	85.78	0.66
MH-4	MH-6	5-3	86.44	18.2	31.5	85.95	85.69	85.84	0.60
MH-4	MH-6	5-2	86.44	24.5	31.5	85.95	85.69	85.89	0.55
MH-5	MH-4	23-1	87.51	10.8	84.0	86.25	85.95	85.99	1.52
MH-5	MH-4	26-10	87.49	13.1	84.0	86.25	85.95	86.00	1.49
MH-5	MH-4	23-2	87.51	17.0	84.0	86.25	85.95	86.01	1.50
MH-5	MH-4	26-9	87.49	20.7	84.0	86.25	85.95	86.03	1.46
MH-5	MH-4	23-3	87.51	24.6	84.0	86.25	85.95	86.04	1.47
MH-5	MH-4	26-8	87.49	25.5	84.0	86.25	85.95	86.04	1.45
MH-5	MH-4	23-4	87.51	29.4	84.0	86.25	85.95	86.06	1.45

Table C5B: USF Freeboard Results - 1996 Event

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.25	85.95	86.07	1.42
MH-5	MH-4	23-5	87.51	37.0	84.0	86.25	85.95	86.08	1.43
MH-5	MH-4	26-6	87.49	39.3	84.0	86.25	85.95	86.09	1.40
MH-5	MH-4	23-6	87.51	43.2	84.0	86.25	85.95	86.11	1.40
MH-5	MH-4	25-10	87.49	47.5	84.0	86.25	85.95	86.12	1.37
MH-5	MH-4	24-1	87.51	51.4	84.0	86.25	85.95	86.13	1.38
MH-5	MH-4	25-9	87.49	55.1	84.0	86.25	85.95	86.15	1.34
MH-5	MH-4	24-2	87.51	59.0	84.0	86.25	85.95	86.16	1.35
MH-5	MH-4	25-8	87.49	59.9	84.0	86.25	85.95	86.17	1.32
MH-5	MH-4	24-3	87.51	63.8	84.0	86.25	85.95	86.18	1.33
MH-5	MH-4	25-7	87.49	67.5	84.0	86.25	85.95	86.19	1.30
MH-5	MH-4	24-4	87.51	71.4	84.0	86.25	85.95	86.21	1.30
MH-5	MH-4	25-6	87.49	73.7	84.0	86.25	85.95	86.21	1.28
MH-5	MH-4	24-5	87.13	76.2	84.0	86.25	85.95	86.22	0.91
MH-5	MH-4	24-6	87.13	80.7	84.0	86.25	85.95	86.24	0.89
MH-7	MH-8	22-1	86.55	11.4	88.3	86.02	85.72	85.76	0.79
MH-7	MH-8	23-12	87.51	12.0	88.3	86.02	85.72	85.76	1.75
MH-7	MH-8	23-11	87.51	18.2	88.3	86.02	85.72	85.78	1.73
MH-7	MH-8	22-2	86.55	19.1	88.3	86.02	85.72	85.79	0.76
MH-7	MH-8	23-10	87.51	25.8	88.3	86.02	85.72	85.81	1.70
MH-7	MH-8	22-3	86.55	26.7	88.3	86.02	85.72	85.81	0.74
MH-7	MH-8	23-9	87.51	30.6	88.3	86.02	85.72	85.83	1.68
MH-7	MH-8	22-4	86.55	34.3	88.3	86.02	85.72	85.84	0.71
MH-7	MH-8	23-8	87.51	38.2	88.3	86.02	85.72	85.85	1.66
MH-7	MH-8	22-5	86.55	41.9	88.3	86.02	85.72	85.86	0.69
MH-7	MH-8	23-7	87.51	44.4	88.3	86.02	85.72	85.87	1.64
MH-7	MH-8	24-12	87.51	52.6	88.3	86.02	85.72	85.90	1.61
MH-7	MH-8	21-1	86.55	52.9	88.3	86.02	85.72	85.90	0.65
MH-7	MH-8	24-11	87.51	60.2	88.3	86.02	85.72	85.93	1.58
MH-7	MH-8	21-2	86.55	60.6	88.3	86.02	85.72	85.93	0.62
MH-7	MH-8	24-10	87.51	65.0	88.3	86.02	85.72	85.94	1.57
MH-7	MH-8	21-3	86.55	68.2	88.3	86.02	85.72	85.95	0.60
MH-7	MH-8	24-9	87.51	72.6	88.3	86.02	85.72	85.97	1.54
MH-7	MH-8	21-4	86.55	75.8	88.3	86.02	85.72	85.98	0.57
MH-7	MH-8	24-8	87.13	77.4	88.3	86.02	85.72	85.98	1.15
MH-7	MH-8	21-5	86.55	83.4	88.3	86.02	85.72	86.00	0.55
MH-7	MH-8	24-7	87.13	85.0	88.3	86.02	85.72	86.01	1.12
MH-8	MH-6	6-1	86.6	11.2	12.7	85.72	85.69	85.72	0.88
MH-9	MH-10	8-1	86.42	8.4	56.0	85.91	85.87	85.88	0.54
MH-9	MH-10	7-3	86.49	19.4	56.0	85.91	85.87	85.88	0.61
MH-9	MH-10	7-2	86.49	27.0	56.0	85.91	85.87	85.89	0.60
MH-9	MH-10	7-1	86.49	34.6	56.0	85.91	85.87	85.89	0.60
MH-9	MH-10	6-3	86.6	45.6	56.0	85.91	85.87	85.90	0.70
MH-9	MH-10	6-2	86.6	53.3	56.0	85.91	85.87	85.91	0.69
								Min	0.49
								Max	1.75
								Average	0.92

Table C6A: Pipe Data and Hydraulic Simulation Results - 100-Year Chicago 3 Hour Event + 20%

U/S MH	D/S MH	U/S Invert Level (m)	D/S Invert Level (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n (-)	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To Peak (hh:mm)	Max U/S HGL (m)	Max D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.36	-0.20	01/01/2019 01:19 AM	85.96	85.94
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.12	0.50	-0.21	01/01/2019 01:12 AM	85.78	85.74
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.12	0.93	-0.05	01/01/2019 01:12 AM	86.12	85.78
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.51	1.19	-0.23	01/01/2019 01:12 AM	85.74	85.62
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.71	-0.13	01/01/2019 01:16 AM	86.26	86.00
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.40	1.06	-0.03	01/01/2019 01:14 AM	86.00	85.74
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.26	0.78	-0.08	01/01/2019 01:17 AM	86.03	86.00
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.19	0.81	-0.07	01/01/2019 01:17 AM	86.06	86.03
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.13	0.99	-0.05	01/01/2019 01:16 AM	85.82	85.60
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.05	0.50	-0.06	01/01/2019 01:27 AM	85.84	85.82
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.45	-0.19	01/01/2019 01:26 AM	85.88	85.84
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.42	1.29	-0.16	01/01/2019 01:12 AM	85.60	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.20	1.05	-0.04	01/01/2019 01:14 AM	85.78	85.60
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.19	1.00	-0.07	01/01/2019 01:12 AM	85.83	85.78
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 01:13 AM	86.10	86.06
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.38	-0.20	01/01/2019 01:14 AM	86.07	85.94
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.19	1.00	-0.08	01/01/2019 01:12 AM	85.94	85.83
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.17	0.79	-0.07	01/01/2019 01:16 AM	86.10	86.06

Table C6B: USF Freeboard Results - 100-Year Chicago 3 Hour Event +20%

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.10	86.06	86.06	1.43
MH-1	MH-2	2-5	86.63	9.0	72.2	86.10	86.06	86.06	0.57
MH-1	MH-2	26-3	87.49	13.1	72.2	86.10	86.06	86.06	1.43
MH-1	MH-2	2-4	86.63	16.6	72.2	86.10	86.06	86.07	0.56
MH-1	MH-2	26-4	87.49	20.7	72.2	86.10	86.06	86.07	1.42
MH-1	MH-2	2-3	86.63	24.2	72.2	86.10	86.06	86.07	0.56
MH-1	MH-2	26-5	87.49	26.9	72.2	86.10	86.06	86.07	1.42
MH-1	MH-2	2-2	86.63	31.8	72.2	86.10	86.06	86.08	0.55
MH-1	MH-2	25-1	87.49	35.1	72.2	86.10	86.06	86.08	1.41
MH-1	MH-2	2-1	86.63	39.5	72.2	86.10	86.06	86.08	0.55
MH-1	MH-2	25-2	87.49	42.7	72.2	86.10	86.06	86.08	1.41
MH-1	MH-2	25-3	87.49	47.5	72.2	86.10	86.06	86.08	1.41
MH-1	MH-2	1-4	86.73	50.5	72.2	86.10	86.06	86.09	0.64
MH-1	MH-2	25-4	87.49	55.1	72.2	86.10	86.06	86.09	1.40
MH-1	MH-2	1-3	86.73	58.1	72.2	86.10	86.06	86.09	0.64
MH-1	MH-2	25-5	87.49	61.3	72.2	86.10	86.06	86.09	1.40
MH-1	MH-2	1-2	86.73	65.7	72.2	86.10	86.06	86.09	0.64
MH-1	MH-2	1-1	86.73	69.7	72.2	86.10	86.06	86.10	0.63
MH-10	MH-12	10-1	86.5	2.3	46.4	85.94	85.83	85.83	0.67
MH-10	MH-12	9-3	86.37	13.2	46.4	85.94	85.83	85.86	0.51
MH-10	MH-12	9-2	86.37	20.9	46.4	85.94	85.83	85.88	0.49
MH-10	MH-12	9-1	86.37	28.5	46.4	85.94	85.83	85.90	0.47
MH-10	MH-12	8-3	86.42	39.5	46.4	85.94	85.83	85.93	0.49
MH-10	MH-12	8-2	86.42	44.4	46.4	85.94	85.83	85.94	0.48
MH-11	MH-10	17-1	86.48	13.0	86.5	86.07	85.94	85.96	0.52
MH-11	MH-10	19-5	86.53	14.1	86.5	86.07	85.94	85.96	0.57
MH-11	MH-10	17-2	86.48	20.6	86.5	86.07	85.94	85.97	0.51
MH-11	MH-10	19-4	86.53	21.7	86.5	86.07	85.94	85.97	0.56
MH-11	MH-10	17-3	86.48	28.2	86.5	86.07	85.94	85.98	0.50
MH-11	MH-10	19-3	86.53	29.3	86.5	86.07	85.94	85.99	0.54
MH-11	MH-10	19-2	86.53	36.9	86.5	86.07	85.94	86.00	0.53
MH-11	MH-10	18-1	86.57	39.2	86.5	86.07	85.94	86.00	0.57
MH-11	MH-10	19-1	86.53	44.5	86.5	86.07	85.94	86.01	0.52
MH-11	MH-10	18-2	86.57	46.8	86.5	86.07	85.94	86.01	0.56
MH-11	MH-10	18-3	86.57	54.4	86.5	86.07	85.94	86.02	0.55
MH-11	MH-10	20-5	86.66	55.5	86.5	86.07	85.94	86.03	0.63
MH-11	MH-10	20-4	86.66	63.1	86.5	86.07	85.94	86.04	0.62
MH-11	MH-10	20-3	86.66	70.8	86.5	86.07	85.94	86.05	0.61
MH-11	MH-10	20-2	86.66	78.4	86.5	86.07	85.94	86.06	0.60
MH-11	MH-10	20-1	86.66	83.6	86.5	86.07	85.94	86.07	0.59
MH-12	MH-13	11-2	86.5	1.2	11.1	85.83	85.78	85.78	0.72
MH-12	MH-13	11-1	86.5	2.5	11.1	85.83	85.78	85.79	0.71
MH-12	MH-13	10-3	86.5	7.1	11.1	85.83	85.78	85.81	0.69
MH-12	MH-13	10-2	86.5	9.4	11.1	85.83	85.78	85.82	0.68
MH-13	MH-14	16-2	86.34	6.4	21.4	85.78	85.60	85.66	0.68
MH-13	MH-14	16-3	86.34	14.0	21.4	85.78	85.60	85.72	0.62
MH-13	MH-14	11-3	86.5	18.6	21.4	85.78	85.60	85.75	0.75
MH-15	MH-16	14-4	86.54	8.9	33.6	85.88	85.84	85.85	0.69
MH-15	MH-16	14-3	86.54	16.5	33.6	85.88	85.84	85.86	0.68
MH-15	MH-16	14-2	86.54	24.2	33.6	85.88	85.84	85.87	0.67
MH-15	MH-16	14-1	86.54	31.8	33.6	85.88	85.84	85.88	0.66
MH-16	MH-17	13-3	86.27	1.2	10.2	85.84	85.82	85.83	0.44
MH-17	MH-14	16-1	86.34	2.3	52.5	85.82	85.60	85.61	0.73
MH-17	MH-14	15-3	86.37	12.2	52.5	85.82	85.60	85.66	0.71
MH-17	MH-14	12-1	86.27	16.0	52.5	85.82	85.60	85.67	0.60
MH-17	MH-14	15-2	86.37	19.8	52.5	85.82	85.60	85.69	0.68
MH-17	MH-14	12-2	86.27	23.6	52.5	85.82	85.60	85.70	0.57
MH-17	MH-14	15-1	86.37	27.4	52.5	85.82	85.60	85.72	0.65
MH-17	MH-14	12-3	86.27	31.2	52.5	85.82	85.60	85.73	0.54
MH-17	MH-14	13-1	86.27	42.2	52.5	85.82	85.60	85.78	0.49
MH-17	MH-14	13-2	86.27	49.8	52.5	85.82	85.60	85.81	0.46
MH-2	MH-3	3-3	86.52	1.5	13.0	86.06	86.03	86.03	0.49
MH-2	MH-3	3-2	86.52	5.5	13.0	86.06	86.03	86.04	0.48
MH-2	MH-3	26-1	87.49	9.6	13.0	86.06	86.03	86.05	1.44
MH-2	MH-3	3-1	86.52	11.8	13.0	86.06	86.03	86.05	0.47
MH-3	MH-4	5-1	86.44	2.0	33.0	86.03	86.00	86.00	0.44
MH-3	MH-4	4-3	86.49	13.0	33.0	86.03	86.00	86.01	0.48
MH-3	MH-4	4-2	86.49	20.6	33.0	86.03	86.00	86.02	0.47
MH-3	MH-4	4-1	86.49	28.2	33.0	86.03	86.00	86.03	0.46
MH-4	MH-6	5-4	86.44	10.6	31.5	86.00	85.74	85.83	0.61
MH-4	MH-6	5-3	86.44	18.2	31.5	86.00	85.74	85.89	0.55
MH-4	MH-6	5-2	86.44	24.5	31.5	86.00	85.74	85.94	0.50
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	86.00	86.04	1.47
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	86.00	86.04	1.45
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	86.00	86.05	1.46
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	86.00	86.07	1.42
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	86.00	86.08	1.43
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	86.00	86.08	1.41
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	86.00	86.09	1.42

Table C6B: USF Freeboard Results - 100-Year Chicago 3 Hour Event +20%

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe length (m)	US MH HGL (m)	DS MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	86.00	86.10	1.39
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	86.00	86.12	1.39
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	86.00	86.12	1.37
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	86.00	86.14	1.37
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	86.00	86.15	1.34
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	86.00	86.16	1.35
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	86.00	86.17	1.32
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	86.00	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	86.00	86.19	1.30
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	86.00	86.20	1.31
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	86.00	86.21	1.28
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	86.00	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	86.00	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	86.00	86.24	0.89
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	86.00	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.12	85.78	85.83	0.72
MH-7	MH-8	23-12	87.51	12.0	88.3	86.12	85.78	85.83	1.68
MH-7	MH-8	23-11	87.51	18.2	88.3	86.12	85.78	85.85	1.66
MH-7	MH-8	22-2	86.55	19.1	88.3	86.12	85.78	85.86	0.69
MH-7	MH-8	23-10	87.51	25.8	88.3	86.12	85.78	85.88	1.63
MH-7	MH-8	22-3	86.55	26.7	88.3	86.12	85.78	85.88	0.67
MH-7	MH-8	23-9	87.51	30.6	88.3	86.12	85.78	85.90	1.61
MH-7	MH-8	22-4	86.55	34.3	88.3	86.12	85.78	85.91	0.64
MH-7	MH-8	23-8	87.51	38.2	88.3	86.12	85.78	85.93	1.58
MH-7	MH-8	22-5	86.55	41.9	88.3	86.12	85.78	85.94	0.61
MH-7	MH-8	23-7	87.51	44.4	88.3	86.12	85.78	85.95	1.56
MH-7	MH-8	24-12	87.51	52.6	88.3	86.12	85.78	85.98	1.53
MH-7	MH-8	21-1	86.55	52.9	88.3	86.12	85.78	85.98	0.57
MH-7	MH-8	24-11	87.51	60.2	88.3	86.12	85.78	86.01	1.50
MH-7	MH-8	21-2	86.55	60.6	88.3	86.12	85.78	86.01	0.54
MH-7	MH-8	24-10	87.51	65.0	88.3	86.12	85.78	86.03	1.48
MH-7	MH-8	21-3	86.55	68.2	88.3	86.12	85.78	86.04	0.51
MH-7	MH-8	24-9	87.51	72.6	88.3	86.12	85.78	86.06	1.45
MH-7	MH-8	21-4	86.55	75.8	88.3	86.12	85.78	86.07	0.48
MH-7	MH-8	24-8	87.13	77.4	88.3	86.12	85.78	86.08	1.05
MH-7	MH-8	21-5	86.55	83.4	88.3	86.12	85.78	86.10	0.45
MH-7	MH-8	24-7	87.13	85.0	88.3	86.12	85.78	86.11	1.02
MH-8	MH-6	6-1	86.6	11.2	12.7	85.78	85.74	85.78	0.82
MH-9	MH-10	8-1	86.42	8.4	56.0	85.96	85.94	85.94	0.48
MH-9	MH-10	7-3	86.49	19.4	56.0	85.96	85.94	85.95	0.54
MH-9	MH-10	7-2	86.49	27.0	56.0	85.96	85.94	85.95	0.54
MH-9	MH-10	7-1	86.49	34.6	56.0	85.96	85.94	85.95	0.54
MH-9	MH-10	6-3	86.6	45.6	56.0	85.96	85.94	85.95	0.65
MH-9	MH-10	6-2	86.6	53.3	56.0	85.96	85.94	85.96	0.64
								Min	0.44
								Max	1.68
								Average	0.87

APPENDIX D

Tables and Calculation Sheets

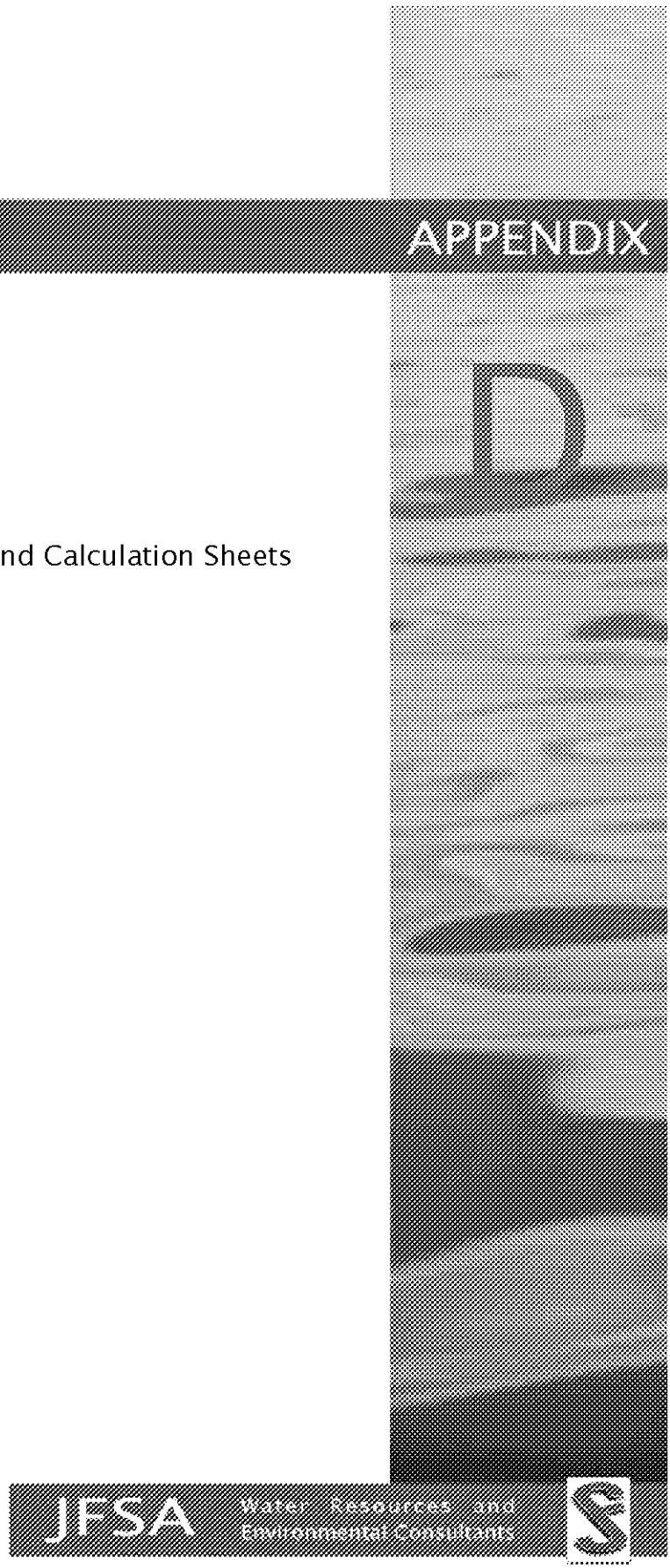


Table D-1: Rational Method CB Flow Calculations

CB	AREA (Ha)	2 YEAR C	2 YEAR Indiv 2.78 AC	2 YEAR Accum 2.78 AC	Time of Conc. (min)	FLOW Intensity 2 Year (mm/hr)	FLOW Peak Flow Q (l/s)	Theoretical minimum ICD Size (mm)
1	0.026	0.52	0.04	0.04				
	0.041	0.58	0.07	0.10				
	0.087	0.33	0.08	0.18	10	76.805	14.1	**83**
2	0.089	0.71	0.18	0.18	10	76.805	13.5	**83**
3	0.089	0.71	0.18	0.18	10	76.805	13.5	**83**
4	0.099	0.63	0.17	0.17				
	0.020	0.52	0.03	0.20	10	76.805	15.5	**83**
5	0.100	0.68	0.19	0.19				
	0.055	0.66	0.10	0.29	10	76.805	22.3	**94**
6	0.067	0.71	0.13	0.13	10	76.805	10.2	**83**
7	0.055	0.68	0.10	0.10				
	0.055	0.63	0.10	0.20	10	76.805	15.4	**83**
8	0.052	0.69	0.10	0.10	10	76.805	7.7	**83**
9	0.069	0.59	0.11	0.11				
	0.066	0.58	0.11	0.22				
	0.027	0.58	0.04	0.26				
	0.026	0.49	0.04	0.30				
	0.026	0.49	0.04	0.33	10	76.805	25.5	**102**
10	0.052	0.72	0.10	0.10				
	0.071	0.71	0.14	0.24	10	76.805	18.8	**83**
11	0.027	0.51	0.04	0.04				
	0.076	0.53	0.11	0.15				
	0.082	0.58	0.13	0.28				
	0.051	0.61	0.09	0.37				
	0.024	0.49	0.03	0.40	10	76.805	30.8	**108**
12	0.066	0.72	0.13	0.13				
	0.049	0.73	0.10	0.23	10	76.805	17.8	**83**
13	0.033	0.56	0.05	0.05				
	0.040	0.57	0.06	0.11				
	0.039	0.58	0.06	0.18	10	76.805	13.6	**83**
14	0.049	0.75	0.10	0.10				
	0.047	0.42	0.05	0.16	10	76.805	12.0	**83**
15	0.021	0.50	0.03	0.03				
	0.014	0.54	0.02	0.05	10	76.805	3.9	**83**
16	0.065	0.59	0.11	0.11				
	0.053	0.70	0.10	0.21	10	76.805	16.0	**83**
17	0.113	0.75	0.24	0.24				
	0.030	0.49	0.04	0.28	10	76.805	21.2	**94**
18	0.073	0.72	0.15	0.15				
	0.047	0.58	0.08	0.22				
	0.021	0.50	0.03	0.25				
	0.026	0.59	0.04	0.29	10	76.805	22.5	**94**
19	0.087	0.67	0.16	0.16				
	0.104	0.70	0.20	0.36	10	76.805	28.0	**102**
20	0.070	0.70	0.14	0.14				
	0.070	0.73	0.14	0.28	10	76.805	21.4	**94**
21	0.097	0.73	0.20	0.20	10	76.805	15.1	**83**
22	0.100	0.74	0.21	0.21	10	76.805	15.8	**83**
23	0.086	0.73	0.17	0.17	10	76.805	13.4	**83**
24	0.099	0.74	0.20	0.20	10	76.805	15.6	**83**
25	0.081	0.71	0.16	0.16	10	76.805	12.3	**83**
26	0.097	0.71	0.19	0.19	10	76.805	14.7	**83**
27	0.006	0.48	0.01	0.01				
	0.024	0.61	0.04	0.05				
	0.038	0.51	0.05	0.10				
	0.035	0.54	0.05	0.16	10	76.805	11.9	**83**
28	0.059	0.40	0.07	0.07				
	0.032	0.35	0.03	0.10				
	0.028	0.57	0.04	0.14	10	76.805	10.9	**83**
29	0.021	0.61	0.04	0.04				
	0.010	0.55	0.02	0.05	10	76.805	3.9	**83**

Table D-2: PCSWMM Subcatchment Parameters

Name	Area (ha)	Width (m)	Slope (%)	Imperv (%)	N-Imperv	N-Perv	Dstore Imperv (mm)	Dstore Perv (mm)	Subarea Routing	Percent Routed (%)	Max Infil Rate (mm/hr)	Min Infil Rate (mm/hr)	Decay Constant (/hr)	Drying Time (days)
A001NE	0.073	43	0.5	74	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A001R1	0.047	39	1.5	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A001R2	0.021	18	1.5	43	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A001R3	0.026	22	1.5	56	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A003NE	0.065	21	0.5	55	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A003NW	0.113	64	0.5	78	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A003R1	0.059	51	1.5	28	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A003R2	0.032	33	1.5	22	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A003R3	0.028	23	2.0	53	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A003SE	0.053	30	0.5	71	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A003SW	0.030	33	0.5	41	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A004NE	0.049	29	0.5	78	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A004NW	0.021	25	0.5	43	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A004R2	0.021	17	1.0	59	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A004R3	0.010	8	1.0	50	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A004SE	0.047	19	0.5	31	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A004SW	0.014	19	1.0	48	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005N1	0.087	58	0.5	67	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005NE	0.097	53	0.5	76	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005NW	0.070	58	0.5	72	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005S1	0.104	43	1.0	71	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005SE	0.100	53	0.5	77	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005SW	0.070	43	1.0	75	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A007NE	0.099	53	0.5	77	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A007NW	0.097	44	2.0	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A007SE	0.086	53	0.5	75	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A007SW	0.081	44	2.0	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A009NE	0.066	33	0.5	74	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A009NW	0.027	33	0.5	44	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A009R1	0.076	62	1.5	47	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A009R2	0.082	68	1.5	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A009R3	0.051	46	1.5	59	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A009SE	0.049	27	0.5	75	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A009SW	0.024	27	0.5	42	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A010NE	0.052	28	0.5	74	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A010NW	0.026	28	0.5	41	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A010R1	0.069	60	1.5	55	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R2	0.066	56	2.0	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R3	0.027	28	2.0	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R4	0.033	27	1.0	51	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R5	0.040	33	1.5	53	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R6	0.039	32	1.0	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010SE	0.071	28	0.5	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A010SW	0.026	28	0.5	41	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A011NE	0.089	59	0.5	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A011SW	0.089	59	0.5	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A013NE	0.052	26	0.5	70	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A014NE	0.026	31	1.0	46	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A014R3	0.041	34	1.0	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A014R4	0.087	77	1.0	19	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A015NE	0.099	74	0.5	61	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A015NW	0.100	74	0.5	68	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A015SE	0.020	25	1.0	46	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A015SW	0.055	25	1.0	65	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A017NE	0.055	38	0.5	69	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A017NW	0.055	34	0.5	62	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A017R1	0.038	31	1.5	44	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A017R2	0.024	20	1.5	59	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A017R5	0.006	9	1.0	40	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A017SW	0.067	46	0.5	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A100	0.680	45	1.0	86	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
AR1	0.035	31	1.0	49	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
Total	4.042			66										

D-3A- ICD Head Flow Rating Curves

	Release Rate (L/s) by ICD Diameter (mm)						
Head (m)	83	94	102	108	127	152	178
0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.050	3.3	4.3	5.0	5.6	7.8	11.1	15.3
0.100	4.7	6.0	7.1	8.0	11.0	15.8	21.6
0.150	5.8	7.4	8.7	9.7	13.5	19.3	26.5
0.200	6.6	8.5	10.0	11.3	15.6	22.3	30.6
0.250	7.4	9.5	11.2	12.6	17.4	24.9	34.2
0.300	8.1	10.4	12.3	13.8	19.1	27.3	37.4
0.350	8.8	11.3	13.3	14.9	20.6	29.5	40.4
0.400	9.4	12.1	14.2	15.9	22.0	31.5	43.2
0.450	10.0	12.8	15.1	16.9	23.3	33.4	45.8
0.500	10.5	13.5	15.9	17.8	24.6	35.2	48.3
0.550	11.0	14.1	16.6	18.7	25.8	37.0	50.7
0.600	11.5	14.8	17.4	19.5	26.9	38.6	52.9
0.650	12.0	15.4	18.1	20.3	28.0	40.2	55.1
0.700	12.4	15.9	18.8	21.0	29.1	41.7	57.2
0.750	12.9	16.5	19.4	21.8	30.1	43.2	59.2
0.800	13.3	17.0	20.1	22.5	31.1	44.6	61.1
0.850	13.7	17.6	20.7	23.2	32.1	45.9	63.0
0.900	14.1	18.1	21.3	23.9	33.0	47.3	64.8
0.950	14.5	18.6	21.9	24.5	33.9	48.6	66.6
1.000	14.9	19.1	22.4	25.2	34.8	49.8	68.3
1.050	15.2	19.5	23.0	25.8	35.6	51.1	70.0
1.100	15.6	20.0	23.5	26.4	36.5	52.3	71.7
1.150	15.9	20.4	24.1	27.0	37.3	53.4	73.3
1.200	16.3	20.9	24.6	27.6	38.1	54.6	74.9
1.250	16.6	21.3	25.1	28.1	38.9	55.7	76.4
1.300	16.9	21.7	25.6	28.7	39.7	56.8	77.9
1.350	17.3	22.1	26.1	29.2	40.4	57.9	79.4
1.400	17.6	22.6	26.6	29.8	41.2	59.0	80.9
1.450	17.9	22.9	27.0	30.3	41.9	60.0	82.3
1.500	18.2	23.3	27.5	30.8	42.6	61.0	83.7
1.550	18.5	23.7	27.9	31.3	43.3	62.0	85.1
1.600	18.8	24.1	28.4	31.8	44.0	63.0	86.4

(1) Head take from the centre of the Orifice

Coefficient of Discharge = 0.62

Table D-4A: Capacity of Lead Pipes

	Release Rate (L/s) by Pipe Diameter (mm)						
Head (m)	100	150	200	250	300	375	450
0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.050	6.4	14.4	25.5	39.9	57.4	89.7	129.2
0.100	9.0	20.3	36.1	56.4	81.2	126.9	182.7
0.150	11.0	24.9	44.2	69.1	99.4	155.4	223.7
0.200	12.8	28.7	51.0	79.7	114.8	179.4	258.3
0.250	14.3	32.1	57.1	89.1	128.4	200.6	288.8
0.300	15.6	35.2	62.5	97.7	140.6	219.7	316.4
0.350	16.9	38.0	67.5	105.5	151.9	237.3	341.8
0.400	18.0	40.6	72.2	112.8	162.4	253.7	365.3
0.450	19.1	43.1	76.5	119.6	172.2	269.1	387.5
0.500	20.2	45.4	80.7	126.1	181.5	283.7	408.5
0.550	21.2	47.6	84.6	132.2	190.4	297.5	428.4
0.600	22.1	49.7	88.4	138.1	198.9	310.7	447.5
0.650	23.0	51.7	92.0	143.7	207.0	323.4	465.7
0.700	23.9	53.7	95.5	149.2	214.8	335.6	483.3
0.750	24.7	55.6	98.8	154.4	222.3	347.4	500.3
0.800	25.5	57.4	102.1	159.5	229.6	358.8	516.7
0.850	26.3	59.2	105.2	164.4	236.7	369.8	532.6
0.900	27.1	60.9	108.3	169.1	243.6	380.6	548.0
0.950	27.8	62.6	111.2	173.8	250.2	391.0	563.0
1.000	28.5	64.2	114.1	178.3	256.7	401.2	577.7
1.050	29.2	65.8	116.9	182.7	263.1	411.1	591.9
1.100	29.9	67.3	119.7	187.0	269.3	420.7	605.9
1.150	30.6	68.8	122.4	191.2	275.3	430.2	619.5
1.200	31.2	70.3	125.0	195.3	281.2	439.4	632.8
1.250	31.9	71.8	127.6	199.3	287.0	448.5	645.9
1.300	32.5	73.2	130.1	203.3	292.7	457.4	658.6
1.350	33.1	74.6	132.6	207.2	298.3	466.1	671.2
1.400	33.8	75.9	135.0	211.0	303.8	474.7	683.5
1.450	34.4	77.3	137.4	214.7	309.2	483.1	695.6
1.500	34.9	78.6	139.8	218.4	314.4	491.3	707.5
1.550	35.5	79.9	142.1	222.0	319.6	499.4	719.2
1.600	36.1	81.2	144.3	225.5	324.8	507.4	730.7

Short tube orifice coefficient = 0.82

Short tube release rate = $C\pi(Dia/1000)^2/4\times(2\times9.81\times H)^{0.5}\times1000$

Table D-4B: PCSWMM Curves for Catchbasins [1]

CB: Fish: Sag	
Depth (m)	Q captured (m³/s)
0.00	0.000
0.05	0.010
0.06	0.019
0.065	0.020
0.07	0.023
0.08	0.027
0.09	0.042
0.10	0.060
0.104	0.065
0.11	0.075
0.12	0.082
0.13	0.098
0.14	0.100
0.15	0.100
0.16	0.100

Table D-4C: PCSWMM Curves for Catchbasins [1]

Curb Inlet: Sag 2% Cross Slope	
Depth (m)	Q captured (m³/s)
0.00	0.000
0.018	0.002
0.03	0.010
0.04	0.018
0.05	0.030
0.06	0.050
0.07	0.080
0.08	0.100
0.09	0.100
0.11	0.100

Table D-4D: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 0.5% long: OPSD 600.01	
Depth (m)	Q captured (m³/s)
0.00	0.000
0.05	0.004
0.06	0.005
0.065	0.009
0.07	0.012
0.08	0.015
0.09	0.025
0.10	0.036
0.104	0.039
0.11	0.045
0.14	0.050
0.15	0.050

Table D-4E: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 1% long: OPSD 600.01	
Depth (m)	Q captured (m³/s)
0.00	0.000
0.05	0.006
0.06	0.007
0.065	0.012
0.07	0.014
0.08	0.022
0.09	0.035
0.10	0.046
0.104	0.050
0.11	0.050

Table D-4F: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 2% long: OPSD 600.01	
Depth (m)	Q captured (m³/s)
0.00	0.000
0.05	0.008
0.06	0.010
0.065	0.014
0.07	0.018
0.08	0.027
0.09	0.040
0.10	0.050
0.104	0.050
0.11	0.050

Table D-4G: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 4% long: OPSD 600.01	
Depth (m)	Q captured (m³/s)
0.00	0.000
0.05	0.010
0.06	0.012
0.065	0.018
0.07	0.023
0.08	0.034
0.09	0.044
0.10	0.050
0.104	0.050
0.11	0.050

Table D-4H: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 5% long: OPSD 600.01	
Depth (m)	Q captured (m³/s)
0.00	0.000
0.05	0.011
0.06	0.013
0.065	0.019
0.07	0.023
0.08	0.035
0.09	0.044
0.10	0.050
0.104	0.050
0.11	0.050

[1] For catchbasins on sags / low points, as provided by the City of Ottawa

[2] For catchbasins on a constant slope, as provided by the City of Ottawa

Table D-5: ICD Type and Inlet Capture Results for the 2-Year Chicago Storm

Catch Basin ID	Applied ICD (mm)	Rational (25-Yr) Peak Flow (m³/s)	Minimum Theoretical ICD Size (Rational) (mm)	Total Simulated Approach Flow (m³/s)	Total Simulated Capture (m³/s)	Max Ponding Depth (cm)	Flow Spread (m)	% of Total Travel Lane [1]
CB_1	152	0.014	83	0.008	0.008	2	0.65	8%
CB_2	83	0.013	83	0.014	0.014	5	1.63	19%
CB_3	83	0.013	83	0.014	0.014	5	1.63	19%
CICB_4	83	0.016	83	0.019	0.019	4	1.31	15%
CICB_5	94	0.022	94	0.019	0.019	4	1.31	15%
CB_6	127	0.010	83	0.014	0.014	5	1.63	19%
CB_7	127	0.015	83	0.014	0.014	5	1.63	19%
CB_8	102	0.008	83	0.003	0.003	2	0.65	8%
CB_9	102	0.026	102	0.036	0.035	6	1.96	23%
CB_10	94	0.019	83	0.015	0.015	6	1.96	23%
CB_11	108	0.031	108	0.038	0.037	5	1.63	19%
CB_12	83	0.018	83	0.014	0.014	5	1.63	19%
CB_13	152	0.014	83	0.012	0.012	-	-	-
CB_14	83	0.012	83	0.007	0.007	4	1.31	15%
CB_15	83	0.004	83	0.007	0.007	4	1.31	15%
CB_16	83	0.016	83	0.026	0.026	8	2.62	31%
CB_17	94	0.021	94	0.026	0.026	8	2.62	31%
CB_18	94	0.023	94	0.013	0.013	3	0.98	12%
CICB_19	102	0.028	102	0.032	0.032	5	1.63	19%
CICB_20	94	0.021	94	0.031	0.031	5	1.63	19%
CB_21	83	0.015	83	0.016	0.016	6	1.96	23%
CB_22	83	0.016	83	0.016	0.016	6	1.96	23%
CB_23	83	0.013	83	0.015	0.015	6	1.96	23%
CB_24	83	0.016	83	0.015	0.015	6	1.96	23%
CB_25	127	0.012	83	0.014	0.014	5	1.63	19%
CB_26	127	0.015	83	0.014	0.014	5	1.63	19%
CB_27	152	0.012	83	0.009	0.009	2	0.65	8%
CB_28	83	0.011	83	0.007	0.007	-	-	-
CB_29	83	0.004	83	0.004	0.004	-	-	-

Table D-6: Ponding at Major Low Points for the 100-Year Chicago Storm & 100-Year Chicago Storm +20%

Catch Basin ID	Major Node	Total Depth		Water Surface Elevation	
		100 Year 3 Hr Chi (cm)	100 Year 3 Hr Chi+20% (cm)	100 Year 3 Hr Chi (m)	100 Year 3 Hr Chi+20% (m)
CB_1	J5	5.0	6.0	87.94	87.96
CB_2	J3	22.0	23.0	88.42	88.44
CB_3	J3	22.0	23.0	88.42	88.44
CICB_4	J14	22.0	25.0	88.25	88.28
CICB_5	J14	22.0	25.0	88.25	88.28
CB_6	J20	9.0	12.0	88.16	88.19
CB_7	J20	9.0	12.0	88.16	88.19
CB_8	J25	5.0	8.0	88.27	88.29
CB_9	J31	22.0	24.0	88.35	88.38
CB_10	J31	22.0	24.0	88.35	88.38
CB_11	J37	19.0	20.0	88.43	88.45
CB_12	J37	19.0	20.0	88.43	88.45
CB_13	-	-	-	-	-
CB_14	J48	13.0	22.0	88.44	88.53
CB_15	J48	13.0	22.0	88.44	88.53
CB_16	J56	25.0	30.0	88.49	88.54
CB_17	J56	25.0	30.0	88.49	88.54
CB_18	J4	12.0	16.0	88.50	88.55
CICB_19	J69	26.0	30.0	88.44	88.48
CICB_20	J69	26.0	30.0	88.44	88.48
CB_21	J76	21.0	26.0	88.47	88.53
CB_22	J76	21.0	26.0	88.47	88.53
CB_23	J83	16.0	21.0	88.45	88.50
CB_24	J83	16.0	21.0	88.45	88.50
CB_25	J92	9.0	10.0	87.82	87.83
CB_26	J92	9.0	10.0	87.82	87.83
CB_27	J5	5.0	6.0	87.94	87.96
CB_28	-	-	-	-	-
CB_29	-	-	-	-	-
MAX		26.0	30.0		

Table D-7: Major System Flow Depths 100-Year Peak Flow

Link Name	Transect	Max Velocity (m/s)	Max Depth (m)	Depth x Velocity (m²/s)
C1	16.5mROW-No-Sidewalk	0.21	0.10	0.02
C101	18mROWwSidewalk	0.58	0.04	0.02
C12	14mROW-No-Sidewalk	0.08	0.14	0.01
C15	14mROW-No-Sidewalk	0.07	0.14	0.01
C16	18mROWwSidewalk	0.14	0.05	0.01
C18	18mROWwSidewalk	0.08	0.05	0.00
C2	16.5mROW-No-Sidewalk	0.06	0.19	0.01
C20	18mROWwSidewalk	0.14	0.05	0.01
C23	18mROWwSidewalk	0.64	0.04	0.03
C26	18mROWwSidewalk	0.46	0.05	0.02
C27	18mROWwSidewalk	0.13	0.08	0.01
C30	18mROWwSidewalk	0.09	0.17	0.02
C32	18mROWwSidewalk	0.07	0.17	0.01
C33	18mROWwSidewalk	0.18	0.08	0.01
C35	18mROWwSidewalk	0.14	0.11	0.02
C38	18mROWwSidewalk	0.04	0.10	0.00
C4	16.5mROW-No-Sidewalk	0.00	0.11	0.00
C40	18mROWwSidewalk	0.00	0.01	0.00
C46	18mROWwSidewalk	0.05	0.09	0.00
C48	16.5mROW-No-Sidewalk	0.12	0.08	0.01
C51	16.5mROW-No-Sidewalk	0.74	0.05	0.04
C53	16.5mROW-No-Sidewalk	0.07	0.15	0.01
C56	16.5mROW-No-Sidewalk	0.17	0.19	0.03
C60_1	16.5mROW-No-Sidewalk	0.00	0.06	0.00
C60_2	16.5mROW-No-Sidewalk	0.44	0.13	0.06
C62	16.5mROW-No-Sidewalk	0.00	0.00	0.00
C64	14mROW-No-Sidewalk	0.00	0.06	0.00
C66	14mROW-No-Sidewalk	0.12	0.19	0.02
C69	14mROW-No-Sidewalk	0.09	0.19	0.02
C7	16.5mROW-No-Sidewalk	0.00	0.00	0.00
C71	16.5mROW-No-Sidewalk	0.00	0.05	0.00
C74	16.5mROW-No-Sidewalk	0.00	0.10	0.00
C76	16.5mROW-No-Sidewalk	0.07	0.19	0.01
C77	16.5mROW-No-Sidewalk	0.09	0.10	0.01
C79	18mROWwSidewalk	0.00	0.05	0.00
C81	18mROWwSidewalk	0.07	0.13	0.01
C83	18mROWwSidewalk	0.00	0.08	0.00
C85	18mROWwSidewalk	0.00	0.00	0.00
C86	18mROWwSidewalk	0.00	0.00	0.00
C88	18mROWwSidewalk	0.00	0.01	0.00
C9	14mROW-No-Sidewalk	0.00	0.03	0.00
C90	18mROWwSidewalk	0.06	0.05	0.00
C91	18mROWwSidewalk	0.11	0.06	0.01
C99_1	18mROWwSidewalk	0.41	0.04	0.02
C99_2	18mROWwSidewalk	0.44	0.05	0.02
Maj-004_1	18mROWwSidewalk	0.00	0.02	0.00
Max		**0.74**	**0.19**	**0.06**

Table D-8: Major System Flow Depths 100-Year+20% Peak Flow

Link Name	Transect	Max Velocity (m/s)	Max Depth (m)	Depth x Velocity (m^2/s)
C1	16.5mROW-No-Sidewalk	0.21	0.12	0.03
C101	18mROWwSidewalk	0.73	0.05	0.04
C12	14mROW-No-Sidewalk	0.09	0.16	0.01
C15	14mROW-No-Sidewalk	0.09	0.17	0.02
C16	18mROWwSidewalk	0.20	0.07	0.01
C18	18mROWwSidewalk	0.12	0.08	0.01
C2	16.5mROW-No-Sidewalk	0.07	0.21	0.01
C20	18mROWwSidewalk	0.15	0.08	0.01
C23	18mROWwSidewalk	0.84	0.06	0.05
C26	18mROWwSidewalk	0.65	0.07	0.05
C27	18mROWwSidewalk	0.20	0.11	0.02
C30	18mROWwSidewalk	0.10	0.20	0.02
C32	18mROWwSidewalk	0.08	0.20	0.02
C33	18mROWwSidewalk	0.26	0.10	0.03
C35	18mROWwSidewalk	0.17	0.13	0.02
C38	18mROWwSidewalk	0.05	0.11	0.01
C4	16.5mROW-No-Sidewalk	0.00	0.12	0.00
C40	18mROWwSidewalk	0.40	0.03	0.01
C46	18mROWwSidewalk	0.08	0.17	0.01
C48	16.5mROW-No-Sidewalk	0.25	0.16	0.04
C51	16.5mROW-No-Sidewalk	0.93	0.09	0.08
C53	16.5mROW-No-Sidewalk	0.18	0.19	0.03
C56	16.5mROW-No-Sidewalk	0.18	0.24	0.04
C60_1	16.5mROW-No-Sidewalk	0.00	0.08	0.00
C60_2	16.5mROW-No-Sidewalk	0.47	0.17	0.08
C62	16.5mROW-No-Sidewalk	0.00	0.01	0.00
C64	14mROW-No-Sidewalk	0.03	0.09	0.00
C66	14mROW-No-Sidewalk	0.13	0.23	0.03
C69	14mROW-No-Sidewalk	0.10	0.23	0.02
C7	16.5mROW-No-Sidewalk	0.00	0.00	0.00
C71	16.5mROW-No-Sidewalk	0.03	0.08	0.00
C74	16.5mROW-No-Sidewalk	0.04	0.14	0.01
C76	16.5mROW-No-Sidewalk	0.07	0.24	0.02
C77	16.5mROW-No-Sidewalk	0.31	0.16	0.05
C79	18mROWwSidewalk	0.11	0.10	0.01
C81	18mROWwSidewalk	0.07	0.19	0.01
C83	18mROWwSidewalk	0.02	0.11	0.00
C85	18mROWwSidewalk	0.23	0.01	0.00
C86	18mROWwSidewalk	0.38	0.01	0.00
C88	18mROWwSidewalk	0.24	0.02	0.00
C9	14mROW-No-Sidewalk	0.00	0.04	0.00
C90	18mROWwSidewalk	0.07	0.07	0.01
C91	18mROWwSidewalk	0.11	0.07	0.01
C99_1	18mROWwSidewalk	0.55	0.07	0.04
C99_2	18mROWwSidewalk	0.54	0.06	0.03
Maj-004_1	18mROWwSidewalk	0.20	0.08	0.02
Max		**0.93**	**0.24**	**0.08**

Stormwater Management Report for Cassette Subdivision 2275 Mer-Bleue Road

City of Ottawa

May 2022

Updated June 2022

Prepared for: David Schaeffer Engineering Ltd.

Prepared by: JFSA Water Resources and Environmental Consultants

JFSA Ref. No. 2321-22

J. F. Sabourin and Associates Inc.
www.jfsa.com

000226

JFSA Water Resources and Environmental Consultants

J.F. Sabourin and Associates Inc.
52 Springbrook Drive, Ottawa, ON K2S 1B9
tel.: 613.836.3884, fax: 613.836.0332, www.jfsa.com

Stormwater Management Report for Cassette Subdivision 2275 Mer-Bleue Road

in the City of Ottawa

May 2022
Updated June 2022

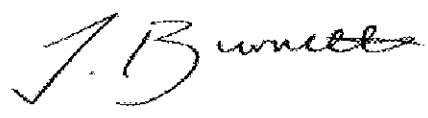
Prepared for:

David Schaeffer Engineering Ltd.

June 2022 report updated by

Paulo Pickart, P.Eng.

Reviewed by :



Jonathon Burnett, B.Eng., P.Eng.

JFSA Ref. No.: 2321-22

Stormwater Management Report
for Cassette Subdivision
2275 Mer-Bleue Road
in the City of Ottawa

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

MODELLING FILES

Background: Rationale for Report Update

This report is an update of the May 2022 "Stormwater Management Report for Cassette Subdivision 2275 Mer-Bleue Road". The update provides additional clarification to the text of the report and modelling updates based on comments provided by the City of Ottawa Reviewers received in June 2022. Review comments mostly pertain to the representation of the CB grates in the model, the addition of closed CBs for several rear yard locations and general further clarification regarding the modelling results and SWM report text.

Stormwater Management Report for Cassette Subdivision 2275 Mer-Bleue Road

in the City of Ottawa
May 2022

1 INTRODUCTION AND OBJECTIVES

J.F. Sabourin and Associates Inc. (JFSA) were retained by David Schaeffer Engineering Ltd. (DSEL) to prepare a Stormwater Management (SWM) Plan for the Cassette Subdivision, located off 2275 Mer-Bleue Road, Orleans, within the City of Ottawa. As shown by the image provided on the cover page, the future development is located west of Mer-Bleue Road, south of Brian Coburn Boulevard and west of Minto's Avalon Encore - Stage 6 development. The proposed development will outlet to the Avalon West (neighbourhood 5) SWM facility, before ultimately discharging to McKinnon's Creek.

The development will have a total drainage area of 4.04 ha, consisting of 3.36 ha of residential units and a 0.68 ha mix-use block. Figure 1 provides an overview of the location of these respective blocks within the subdivision. The subject site is tributary to the existing Avalon West (N5) SWM Facility, south of Avalon Encore Stage 5, which will provide both the quantity and quality control for the subject site before discharging to McKinnon's Creek to the south. To ensure that the proposed development does not adversely affect the existing downstream developments and associated SWM pond operations, peak flows from the subject site have been limited to 220 L/s/ha as per the Draft Plan of Subdivision, FSR and Avalon Encore Stage 6 Design Brief.

The purpose of this report is to evaluate the major and minor system flows of the proposed Cassette residential development with respect to City of Ottawa stormwater management guidelines and to check the adequacy of the proposed pipe sizes to convey the assigned unitary release rate of 220 L/s/ha and ensure the safe conveyance of the 100-year storm flows from within the development. The following background documents were reviewed in preparing this report:

- *Stormwater Management Planning and Design Manual,* Ministry of the Environment, March 2003.
- *Erosion and Sediment Control Guidelines for Urban Construction,* Conservation Halton et al., December 2006.
- *City of Ottawa Sewer Design Guidelines,* City of Ottawa, October 2012.
- *Technical Bulletin ISDTB-2014-01, Revisions to Ottawa Design Guidelines – Sewer,* City of Ottawa, February 2014.
- *City of Ottawa Technical Bulletin PIEDTB-2016-01*, City of Ottawa, September 2016.
- *City of Ottawa Technical Bulletin ISTB-2018-04*, City of Ottawa, June 2018.

- *Avalon Encore Stage 6, Stormwater Management and Site Servicing Design, Brief Atrel Engineering, March 2018.*
- *Design Brief for Interim Expansion of the Avalon West Stormwater Management Pond for the Summerside South Phase 1 Subdivision DSEL & JFSA, June 2019.*
- *Functional Servicing Report For 2275 Mer Bleue Road – Caivan Communities, JFSA, June 2021.*
- *Design Report And Stormwater Management Brief - Caivan Cassette Subdivision (2275 Mer Bleue Road) Urbantech, December 2021.*
- *2275 Mer Bleue Road / Preliminary Stormwater Management Design, JFSA March 2021*

As per the approach formalized in the September 2016 *City of Ottawa Technical Bulletin PIEDTB-2016-01*, the proposed subdivision has been designed with a 2-year minor system level of service, while ensuring the specified unitary release rate (220L/s/ha) is not exceeded. Where possible with grading and minor system capture limitations, road ponding areas up to 35 cm deep were used to contain the 100-year major system flows.

The PCSWMM computer program has been used to model the major and minor systems, to ensure that all stormwater management requirements are satisfied. The general SWM design criteria and guidelines that are to be met are described in Section 2.

Legend

Site Plan

Land Use

Mixed Use

Residential

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.

DSEL
david schaeffer engineering ltd

Mer Bleue Subdivision

Figure 1: Site Overview

PROJECT	2321
DRAWN	MP
DATE	MAY 2022

C:\Users\...\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER - Documents\PROJ\2321 221202204 Sub...\Design\GIS\20220429 Report Figures

2 DESIGN CRITERIA AND GUIDELINES

The design criteria and guidelines used for the stormwater management of the subject subdivision are those that were developed in the background documents, as well as those provided in the October 2012 *City of Ottawa Sewer Design Guidelines* and subsequent technical memorandums, and generally accepted stormwater management design guidelines.

The detailed design of the proposed Cassette development has a total drainage area of 4.04 ha with an average imperviousness of 66%. A detailed analysis of the proposed dual drainage system was required to confirm that the following general design criteria and guidelines for the minor and major systems would be met.

2.1 Minor System

a) Storm sewers are to be designed to provide a minimum 2-year level of service, while not exceeding the specified unitary release rate (220L/s/ha).

b) The 100-year hydraulic grade line (HGL) within the development's minor systems must be maintained at least 0.3 m below the underside of footing elevation where gravity house connections are installed.

c) For less frequent storms (i.e. larger than 1:2 year or 1:5 year on collector / 1:10 year on arterial roads), the minor system shall, if required, be limited with the use of inlet control devices to prevent excessive hydraulic surcharges and to maximize the use of surface storage on the road where desired.

d) Catch basins on the road are to be equipped with City standard type S19 (fish) grates or City standard type S22 side inlets, and grates for catch basins in rear yards, parks and open spaces with pedestrian traffic are to be City standard type S19, S30 and S31.

e) Both Single and double catch basins are to be equipped with 200 mm minimum lead pipes.

f) Rearyard catch basins are to be equipped with 250 mm minimum lead pipes. Catch basins installed on the street, where rearyard catch basins connect to the main storm sewer through the catch basin, are to be equipped with 250 mm minimum lead pipes for both single and double catchbasins.

g) Under full flow conditions, the allowable velocity in storm sewers is to be no less than 0.80 m/s and no greater than 3.0 m/s. Where velocities over 3.0 m/s are proposed, provisions shall be made to protect against displacement of sewers by sudden jarring or movement. Velocities greater than 6 m/s are not permitted.

2.2 Major System

a) The major system shall be designed with enough road surface storage to allow the excess runoff of a 100-year storm to be retained within road ponding areas where desired.

b) Inlet control devices should be sized such that they do not create surface ponding on the road during the 2-year design storm; it should be noted that surface ponding over grates is present during rainfall under any design, as an appropriate depth of water is required for runoff to enter the grate, although for these smaller events the ICDs have been appropriately sized to ensure that they are not acting as a restriction to the flow entering the minor system.

c) Roof leaders shall be installed to direct the runoff to splash pads and onto grassed areas.

d) For the 100-year storm, the maximum total depth of water (static + dynamic) on all roads shall not exceed 35 cm at the gutter.

e) During the 100-year + 20% stress test, the maximum extent of surface water on streets, rearyards, public spaces and parking areas shall not touch the building envelope.

f) When catch basins are installed in rear yards, safe overland flow routes are to be provided to allow the release of excess flows from such areas.

g) The product of the maximum flow depths on streets and maximum flow velocity must be less than 0.60 m^2/s on all roads.

h) For the majority of the developments, the excess major system flows up to the 100-year return period are to be retained on-site in development blocks such as parks, schools, and commercial, unless specified otherwise.

i) There must be at least 15 cm of vertical clearance between the spill elevation on the street and the ground elevation at the nearest building envelope that is in the proximity of the flow route or ponding area.

j) There must be at least 30 cm of vertical clearance between the rear yard spill elevation and the ground elevation at the adjacent building envelope.

3 ASSUMPTIONS AND SOURCE OF DATA USED IN THIS STUDY

Sources of information and assumptions made in this study are listed below:

- Stormwater management model: *PCSWMM (SWMM5 Engine 5.1.015)*
- Minor system design: *1:2 year, plus 1:5-year inflows on collector roads and 1:10 year on arterial roads. See the Rational Method Calculations in Appendix A.*
- Major system design: *1:100 year*
- Max. 100-yr water depth on roads: *35 cm above the gutter*
- Extent of the major system: *Shall not touch the building envelope during the 100-year + 20% stress test*
- PCSWMM model parameters: *Fo = 76.2 mm/hr, Fc = 13.2 mm/hr, DCAY = 4.14/hr, D.Stor.Imp. = 1.57 mm, D.Stor.Per. = 4.67 mm (as per 2012 City of Ottawa Sewer Design Guidelines)*
  Detailed Area Imperviousness: maximum allowable zoning. Lumped Area Imperviousness: based on runoff coefficient (C) where C = 0.7 x imperviousness ratio+ 0.2.
- Design storms: *2-, 5-, 10-, and 100-year 3-hour Chicago and the 100-year 24-hour SCS Type II storms as per 2012 City of Ottawa Sewer Design Guidelines; peak averaged over 10 minutes.*
- Historical Events: *July 1st, 1979; August 4th, 1988; and August 8th, 1996, events as per 2012 City of Ottawa Sewer Design Guidelines.*
- Stress Test: *20% increase in the 100-year 3-hour Chicago storm.*
- Street catch basin covers: *City Standard Type S19 (fish) or City Standard Type S22 (side inlet). Approach flow-capture curves as per PCSWMM Curves provided by the City of Ottawa.*
- Rear yard catch basin covers: *City Standard Type S19, S30 and S31*
- Curb and gutter: *City Standard SC1.3 (mountable) and SC1.1 (barrier). In the absence of flow capture curves for these curbs and gutters, OPSD 600.010 curb and gutters are assumed.*
- Manning's' roughness coeff.: *0.013 for concrete and PVC pipes (free flow).*
- Minor system losses: *Refer to Appendix C for maintenance hole loss coefficients.*
- Underside of footing elevations: *As provided by DSEL.*
- Freeboard in HGL analysis: *0.3 m between the underside of footing elevation and 100-year hydraulic gradeline.*
- Inlet Control Devices: *Refer to Appendix B for Plas-Tech ICD details.*
- Depth of backyard swales: *As per DSEL's Grading Plan*
- Street and pipe dimensions: *As per DSEL's Plan and Profiles*
- Right-of-way characteristics: *As per DSEL's Details of Roads*
- Downstream HGL: 100-year HGL at existing MH 6608 and MH 6559 as modelled in the June 2019 SWM Report for Summerside South Phase 1, for which detailed modelling of the Avalon West subdivision was incorporated into the overall model by IBI Group on Sept. 6, 2018, or as per March 13, 2018,

Avalon West Stage 6 Major System Stormwater Analysis memo by IBI Group, whichever is higher. For this analysis:
MH-6559 - 100 Year HGL = 85.47m,
MH-6608 – 100 Year = 85.48m.

4 PROPOSED MINOR AND MAJOR SYSTEM DRAINAGE

The proposed minor and major system drainage routes are shown in plan view in Figures 2 and 3. As per City standards, the minor system has been designed to accommodate a minimum of the 2-year post-development flows from within the site and local roads, plus 5-year inflows on collector roads and 10-year inflows on arterial roads. A Rational Method design was conducted by DSEL (refer to Appendix A) to estimate minor system flows based on the City of Ottawa IDF relationship and selected runoff coefficients.

The minor system release rates from the 0.68 ha mix-use block were assumed to be limited to 220 L/s/ha (149.6 L/s) capture to the minor system with onsite storage provided up to the 100-year event. These model simulations indicate that approximately 56 m^3 of onsite storage will be required to contain the 100-year event onsite. Note that this storage volume has been approximately calculated and has simply been provided in this report to give an approximate order of magnitude with regards to the required storage volume. The exact volume required for the site and how that volume will be achieved should be assessed in more detail through a Site Plan Application.

Where possible with grading limitations, road ponding areas up to 35 cm deep were used to contain the 100-year major system flows in the development. Note that rear yard catch basins are connected to catch basins on the road where possible, to allow rear yard runoff access to the storage in road ponding areas at regular intervals while also preventing runoff from these rear yards from leaving the site. In a design of this type where lots are serviced by gravity house connections, inlet control devices (ICDs) can be used to limit minor system capture at each catch basin to the appropriate level of service. Minimum ICD sizes have been determined based on the rational method calculations, see Appendix D Table D1 and D5, with ICD sizes increased only if the detailed modelling determines it to be applicable (e.g. ponding depths exceeding 0.35m or to minimize major system runoff during extreme events).

Within the development, circular orifice plate type Inlet Control Devices (ICDs) of City standard diameters of 83 mm, 94 mm, 102 mm, 108 mm, 127 mm, 152 mm and 178 mm will be used to limit minor system capture to a minimum of the 2-year flow (refer to Appendix B for Plas-Tech ICD details), allowing for sub-surface storage of 0.5 m^3 in single catch basins, 1.0 m^3 in double catch basins, and 1.9 m^3 in catch basin manholes. Note that this subsurface catch basin storage has not been included in the modelling to be conservative.

To best represent the connection between the minor and major systems, each grate and ICD/lead pipe of the catch basins has been explicitly represented in the model. Each CB in the model has been represented as a node, with the hydraulic operations of each CB grate represented by

PCSWMM catchbasin approach flow-capture curves provided by the City of Ottawa depending on the implementation of the conventional CB or Curb Inlet CB (see Appendix D, Tables D-4B to D-4H). ICDs have been represented as vertical orifices with the respective ICD size, where no ICD is required the proposed lead pipe has been represented in the model as a short tube orifice (C_o=0.82) with the corresponding pipe diameter applied. When CBs also have flow contributions from rear yards, flows from the rear yards are placed directly to the CB node, while flows from the road are placed on the road which ensures that these flows first have to pass through the CB grate before entering the CB. This configuration allows the model to independently determine if at any given instant during a simulation whether the grate or ICD/lead pipe is controlling flow.

The street segments within the proposed development have been designed using a 'saw tooth' or 'sagged' road profile. The runoff from within these segments will be conveyed to catch basins located at the lowest point within the street segment. Flows more than the catch basin capture rate will be temporarily stored within the 'sagged' street segments and released slowly to the storm sewers, up to the 100-year design storm. When the storage on a specific street segment is surpassed due to blockage or an event greater than the 100-year storm, the excess water will flow towards the next downstream street sag, and eventually to the pond. It should be noted that the major system would outlet during the 100-year + 20% stress test without flooding any of the properties within the subdivision.

If the drainage system's capacity to capture surface flows is exceeded, Figure 5 presents the maximum extent of static surface ponding and volume on the streets based on grading. Additionally, surface storage volumes that may exist in the rear yards have not been considered in this model. This has been completed to ensure that the peak flows and ponding volumes calculated in the model are conservative.

The PCSWMM modelling, discussed in Sections 4.1 and 4.2, has demonstrated that the proposed drainage system for the subdivision will have sufficient capacity to control the excess flow during a 100-year storm and safely capture and convey the 2-year (plus 5-year on collector roads and 10-year on arterial roads) flow to the pond, without exceeding the specified unitary release rate. Note that all values presented in this SWM report are based on the reported maximum value (1-minute intervals) and not the maximum simulated value (0.5-second intervals).

4.1 Major System Analysis

The PCSWMM model was developed based on the information provided in Figures 2 and 3. Eight (8) simulations were conducted, one for each of the following rainfall events:

i) the 2-year, 3-hour Chicago storm;
ii) the 5-year, 3-hour Chicago storm;
iii) the 10-year, 3-hour Chicago storm;
iv) the 100-year, 3-hour Chicago storm;
v) the 100-year, 24-hour SCS Type II storm
vi) the July 1st, 1979 historical event;
vii) the August 4th, 1988 historical event;
viii) the August 8th, 1996 historical event; and
ix) the 100-year, 3-hour Chicago storm + 20%.

Note that the purpose of simulating the 100-year, 3-hour Chicago storm with a 20% increase is to stress test the drainage system for potential flooding, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. The depression storage and infiltration parameters in both the PCSWMM and SWMHYMO models are as per the October 2012 *City of Ottawa Sewer Design Guidelines*. The percent imperviousness of the detailed drainage areas has been established based on the maximum allowable impervious area for each of the respective zoning requirements The percent imperviousness of undetailed (lumped/external) drainage areas were calculated based on the runoff coefficient (C), where C = 0.7 x imperviousness ratio + 0.2. Figure 6 provides an overview of the subcatchments and the assumed impervious area, and Table D-2 provides a full summary of all subcatchment parameters modelled in PCSWMM.

As mentioned above, rational method calculations have been completed to determine the peak flows to each of the CBs within the development based on the required level of service (2/5/10-Year), see Table D5 in Appendix D for the full comparison between the rational method flows and those simulated in PCSWMM, and the respective ICD applied. Note that it is seen that the applied ICD size is either equal to or larger than that determined to convey the rational method flow. It is important to note that the rational method calculations assume 100% capture at each CB, which is true for CBs at low points but not always the case for CBs on a slope. Even in light of the expected differences due to assumptions and approach from this analysis it was found that the average difference between the rational method and simulated flows was only 0.5 L/s, with the main difference coming from the CBs with larger drainage areas where the Time of Concentration (T_c) may be greater than 10 minutes, as assumed in the rational method calculations.

Where required inflows are limited by circular orifice plate type Inlet Control Devices (ICDs) of City standard diameters 83 mm, 94 mm, 102 mm, 108 mm, 127 mm, 152 mm and 178 mm. Refer to Figure 2 for the proposed ICD sizes throughout the development. Note that 200 mm diameter lead pipes were assumed and are required between single catch basins and the storm sewers, and 250 mm diameter lead pipes were assumed and are required between rear yard catch basins or single catch basin manholes and the storm sewers.

Within the proposed subdivision, the dynamic flow depth on the road (at the gutter) will be minimal during the 100-year Chicago storm, as the 100-year flows are mostly retained within the road ponding areas and do not accumulate as in a typical subdivision design. Furthermore, it was determined that for the 100-year storm at all major system segments, the product of the depth of water (m) at the gutter multiplied by the velocity of flow (m/s) will not exceed the maximum allowable 0.6 m^2/s (refer to Table D-7 of Appendix D, where the calculated maximum was determined to be 0.06 m^2/s).

Details of the 100-year street maximum water depth and water surface elevations are provided in Table D-6 of Appendix D. Based on DSEL's grading the major system has approximately 197.5 m^3 of storage at these localized low points throughout the development. Depths calculated by the PCSWMM model demonstrate that a total 100-year depth of water (static and dynamic) on the street at these ponding areas will not exceed the maximum depth of 35 cm and that the maximum ponding depth throughout the subdivision for this event is 26 cm.

Table D-6 of Appendix D also presents the street storage stress test results based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. As shown in Table D-6, the maximum depth of water (static + dynamic overflow) at any ponding area under these conditions is calculated as 30 cm. The maximum extent of surface water during the 100-year + 20% stress test will not touch the building envelopes, refer to DSEL drawings for the build envelope elevations.

Within the development, there are 3 major system outflow locations from the development, one west along Broadcast Avenue to Mer-Bleue Road, one to the south via Sculpin Street and one east to the neighbouring Avalon Encore development via an open walkway block. Table 1A below outlines the peak flows and total runoff volumes from the development to these neighbouring properties for both the 100-Year 3hour Chicago and 24-hour SCS storms.

Table 1A: Major System Flow from the Cassette Development

Event	Location	Peak Major System Flow Offsite (m^3/s)	Total Major System Flow Volume Offsite (m^3)	Site Total Runoff Volume (m^3)	% of total Runoff Spilling from Development
100 Year CHI 3Hr	To Avalon Encore (East)	0.016	9.8		0.4%
	To Mer-Bleue Road (West)	0.008	5.7	2239	0.3%
	To Sculpin Street (South)	0.031	38.3		1.7%
	Total	0.055	53.8	2239	2.4%
100 Year SCS 24 Hr	To Avalon Encore (East)	0.013	7.7		0.3%
	To Mer-Bleue Road (West	0.005	5.5	3007	0.2%
	To Sculpin Street (South)	0.024	26.0		0.9%
	Total	0.042	39.2	3007	1.3%

From Table 1A above it is seen that for the 100-Year event 1.3%-2.4% of the total runoff from the development will spill to neighbouring developments, this equates to a total runoff volume of 53.8 m^3 and 39.2 m^3 for the 100-year Chicago and SCS storms respectively, which is mostly a product from local drainage that can not be contained within the development due to grading constraints (e.g. connecting the proposed development roads with existing neighbouring roads). Note that based on DSELs detailed grading plan there is 37$m^3$of static storage available in the rear yards that have not been included in the modelling (as per City guidelines), as such it is reasonable to conclude the major system runoff volumes presented above are a conservative approximation during these extreme events.

Table 1B below presents a summary of the major system ponding depth and the ponding duration for both the 100-year 3 Hour Chicago storm and 100-Year 24Hr SCS storm. Note that the ponding duration has been calculated as the duration of time throughout the simulation (3 or 24 hours) in which the ponding depth at the CB grate is greater than 1 cm. Based on this analysis it was found that for the 100-Year 3 Hour Chicago event, the maximum ponding depth is 26 cm and the maximum ponding duration is 2 hours and 44 minutes. For the 100 Year 24-hour SCS event, the maximum ponding depth is 24 cm and the maximum ponding duration is 4 hours and 54 minutes. Note that for both events the ponding duration is less than the rainfall duration (3 Hours and 24 Hours), as such it is expected that there will be no nuisance ponding throughout this development after the rainfall event has finished for events up to and including the 100-year.

Table 1B: Major System Maximum Ponding Depth and Duration[1]

Node	100yrChicago3hr		100YrSCS24	
	Max Ponding Depth (m)	Ponding Duration (hh:mm)	Max Ponding Depth (m)	Ponding Duration (hh:mm)
J10	6	00:31	5	00:22
J104	4	00:50	3	00:44
J14	22	02:41	21	03:34
J16	7	00:30	6	00:20
J17	3	00:15	2	00:04
J2	16	00:41	13	00:31
J20	9	01:17	8	01:04
J22	3	00:38	2	00:33
J25	5	00:59	4	00:59
J27	4	00:23	3	00:14
J29	13	00:41	11	00:35
J3	22	01:20	19	01:04
J31	22	01:12	20	01:03
J33	12	00:40	10	00:32
J35	4	00:20	4	00:16
J37	19	01:10	18	01:02
J39	1	00:04	1	00:00
J4	12	01:39	11	01:35
J45	5	00:18	0	00:00
J48	13	00:55	8	00:58
J5	5	00:53	4	00:50
J50	4	00:18	2	00:11
J52	5	00:21	4	00:14
J56	25	01:50	24	02:00
J59	13	01:29	12	01:30
J6	0	00:00	0	00:00
J62	0	00:00	0	00:00
J64	0	00:00	0	00:00
J66	13	00:40	11	00:29
J69	26	02:44	24	04:54
J71	11	00:40	9	00:28
J73	0	00:00	0	00:00
J76	21	01:28	18	01:30
J77	16	00:41	13	00:36
J8	0	00:00	0	00:00
J80	0	00:00	0	00:00
J82	11	00:35	9	00:30
J83	16	01:23	13	01:19
J86	0	00:00	0	00:00
J87	0	00:00	0	00:00
J89	0	00:00	0	00:00
J91	3	00:11	2	00:10
J92	9	01:19	8	01:03
Maj-002	0	00:00	0	00:00
Average	**9**	**00:43**	**7**	**00:42**
Maximum	**26**	**02:44**	**24**	**04:54**

[1] Ponding duration calculated as duration throughout the simulation where the ponding depth is greater than 1cm

4.2 Minor System and Hydraulic Gradeline Analysis

The minor system analysis was completed using the PCSWMM program based on the peak flows captured during the rainfall events. Note that the storm sewer design is as provided by DSEL, and a Manning's roughness coefficient of 0.013 was used for concrete and PVC storm sewer pipes. Refer to Appendix C for maintenance hole loss coefficients used in the PCSWMM model.

The proposed development has two independent storm sewer networks that both ultimately discharge to the Avalon West SWM pond. As established above the maximum allowable release rate for these lands has been set at 220 L/s/ha. Based on the detailed design completed by DSEL the site will have a total drainage area of 4.04 ha, with 2.28 draining to the east (MH 6559) storm sewer network and 1.76 ha drainage to the south (MH-6608) storm sewer network, refer to Figure 2 for the extents of each of the storm sewer networks. Table 2A below outlines the maximum allowable release rates for each of these storm sewer networks.

Table 2A: Maximum allowable release rates for Cassette Development

Location	Drainage Area (ha)	Maximum Unitary Release Rate (L/s/ha)	Maximum Allowable Release Rate (L/s)
MH-6559 (East)	2.28	220	502
MH-6608 (South)	1.76	220	387
Total	4.04	220	889

Note: The total flows calculated as per PCSWMM model peak reported inflow values (1-minute interval)

The minor system performance for this site was analyzed under a fixed downstream elevation of 85.48m for MH-6608 (south outlet) and 85.47m for MH 6559 (east outlet). The HGL values outlined above are as per the maximum 100-year HGL at existing MH 6608 and MH 6559 as modelled in either the June 2019 SWM Report for Summerside South Phase 1 or as per March 13, 2018, Avalon West Stage 6 Major System Stormwater Analysis memo by IBI Group, reference document provided in Appendix C. Table 2B presents the peak minor system outflows obtained based on the rational method and the detailed model simulations.

Table 2B: Comparison of Minor System Flows (3-Hour Chicago Storm) from the Development

Location	DSEL Rational Method Flow (m^3/s)	2-Year PCSWMM Flow (m^3/s)	5-Year PCSWMM Flow (m^3/s)	100-Year PCSWMM Flow (m^3/s)
MH-6559 (East)	0.339	0.307	0.407	0.491
MH-6608 (South)	0.190	0.196	0.268	0.384

Note: The total flows calculated as per PCSWMM model peak reported inflow values (1-minute interval)

Table 2B shows that the total 2-year flows simulated by the PCSWMM models for the south storm sewer network (MH-6608) are very similar to the rational method calculations (difference of +6 L/s). For the east storm (MH-6559) sewer network the simulated 2-year flows are slightly less (-32 L/s) than that calculated by DSEL's rational method calculations, but these rational calculations are less than that simulated by the PCSWMM model for the 5-year event. This

discrepancy can be explained by the fact that the rational method calculations are based on a mix of 2 & 5-year capture rates (mixed-use block). While the detailed model simulates runoff for these subcatchments based on a single rainfall event (e.g. 2-Year event), as such it is expected that the rational method calculations fall somewhere between the 2- and 5-year flow determined from the detailed SWM modelling.

The PCSWMM simulations have determined that for the selected 2-, 5- and 100-year 3-Hour Chicago storms, the total minor system flows from the Cassette east (MH-6559) storm sewer network would be 0.307 m^3/s, 0.407 m^3/s and 0.491 m^3/s, respectively, and the total minor system flows from the Cassette south (MH-6608) storm sewer network would be 0.196 m^3/s, 0.268 m^3/s and 0.384 m^3/s, respectively. It is important to note that the 100-year flows (both SCS and CHI) for both east and west storm sewers are less than that specified in Table 2A. As such, the proposed development is releasing at a rate lower than the 220 L/s/ha specified and will not have any adverse impacts on the downstream developments or SWM pond operations.

Additionally, the 5-Year flow calculations from the subject storm sewer networks per Atrel's March 2017, Neighbourhood 5 - Avalon Encore - Western Trunk study assumed a peak flow of 408L/s to MH-6559 (East) and 456L/s to MH-6608 (South), see Appendix B for the rational method calculation sheet from the study referenced above. As per Table 2B above the detailed simulated 5-year flows to these respective storm sewer locations have been determined to be 407L/s (-1L/s) and 268 L/s (-188 L/s), as such the proposed development will not adversely affect the existing storm sewer network. Although the 100-year flow will surcharge some parts of the minor system, a freeboard of 0.3 m between the 100-year hydraulic grade line and the underside of footings has been provided throughout the proposed development due to the various levels of service provided.

Tables C-1A and C-6B of Appendix C summarize the pipe data and hydraulic simulation results for the 100-year 3-hour Chicago storm, 100-year 24-hour SCS Type II storm, and the three historical events. Note that a minimum freeboard of 0.3 m between the hydraulic grade line and the underside of footings has been provided throughout the proposed developments for the 100-year storms and for all historical events. Additionally, note that the majority of the flowing full pipe velocities are no less than 0.80 m/s and no greater than 3.0 m/s. If velocities are over 3.0 m/s, provisions shall be made to protect against displacement of sewers by sudden jarring or movement. Velocities greater than 6 m/s are not permitted.

Table C-6B of Appendix C presents the climate change stress test results for the hydraulic grade line analysis based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*. Under these conditions, no locations within the proposed developments have a USF freeboard less than 0 m, with a minimum freeboard of 44cm from the USF at Unit 5-1.

Table 3 presents the composite hydraulic grade line results for the 100-year 3-hour Chicago and 100-year 24-hour SCS Type II design storms. The maximum HGL at each Maintenance Hole is interpolated between each connection and compared to the USF of each unit within that storm sewer connection. Based on Table 3 below the minimum freeboard for the 100-year event is 45cm at Unit 5-1, with an average freeboard across the development of 88cm.

Table 3: Composite Hydraulic Grade Line Results for 100-Year Design Storms
(Fixed Downstream Boundary)

US MH	DS MH	Junc	Loss (m)	Dist from DS MH (m)	Pipe Length (m)	US HGL (m)	DS HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.10	86.05	86.05	1.44
MH-1	MH-2	2-5	86.63	9.0	72.2	86.10	86.05	86.05	0.58
MH-1	MH-2	26-3	87.49	13.1	72.2	86.10	86.05	86.06	1.43
MH-1	MH-2	2-4	86.63	16.6	72.2	86.10	86.05	86.06	0.57
MH-1	MH-2	26-4	87.49	20.7	72.2	86.10	86.05	86.06	1.43
MH-1	MH-2	2-3	86.63	24.2	72.2	86.10	86.05	86.06	0.57
MH-1	MH-2	26-5	87.49	26.9	72.2	86.10	86.05	86.07	1.42
MH-1	MH-2	2-2	86.63	31.8	72.2	86.10	86.05	86.07	0.56
MH-1	MH-2	25-1	87.49	35.1	72.2	86.10	86.05	86.07	1.42
MH-1	MH-2	2-1	86.63	39.5	72.2	86.10	86.05	86.07	0.56
MH-1	MH-2	25-2	87.49	42.7	72.2	86.10	86.05	86.08	1.41
MH-1	MH-2	25-3	87.49	47.5	72.2	86.10	86.05	86.08	1.41
MH-1	MH-2	1-4	86.73	50.5	72.2	86.10	86.05	86.08	0.65
MH-1	MH-2	25-4	87.49	55.1	72.2	86.10	86.05	86.09	1.40
MH-1	MH-2	1-3	86.73	58.1	72.2	86.10	86.05	86.09	0.64
MH-1	MH-2	25-5	87.49	61.3	72.2	86.10	86.05	86.09	1.40
MH-1	MH-2	1-2	86.73	65.7	72.2	86.10	86.05	86.09	0.64
MH-1	MH-2	1-1	86.73	69.7	72.2	86.10	86.05	86.10	0.63
MH-10	MH-12	10-1	86.5	2.3	46.4	85.91	85.80	85.80	0.70
MH-10	MH-12	9-3	86.37	13.2	46.4	85.91	85.80	85.83	0.54
MH-10	MH-12	9-2	86.37	20.9	46.4	85.91	85.80	85.85	0.52
MH-10	MH-12	9-1	86.37	28.5	46.4	85.91	85.80	85.87	0.50
MH-10	MH-12	8-3	86.42	39.5	46.4	85.91	85.80	85.90	0.52
MH-10	MH-12	8-2	86.42	44.4	46.4	85.91	85.80	85.91	0.51
MH-11	MH-10	17-1	86.48	13.0	86.5	86.07	85.91	85.94	0.54
MH-11	MH-10	19-5	86.53	14.1	86.5	86.07	85.91	85.94	0.59
MH-11	MH-10	17-2	86.48	20.6	86.5	86.07	85.91	85.95	0.53
MH-11	MH-10	19-4	86.53	21.7	86.5	86.07	85.91	85.95	0.58
MH-11	MH-10	17-3	86.48	28.2	86.5	86.07	85.91	85.96	0.52
MH-11	MH-10	19-3	86.53	29.3	86.5	86.07	85.91	85.97	0.56
MH-11	MH-10	19-2	86.53	36.9	86.5	86.07	85.91	85.98	0.55
MH-11	MH-10	18-1	86.57	39.2	86.5	86.07	85.91	85.98	0.59
MH-11	MH-10	19-1	86.53	44.5	86.5	86.07	85.91	85.99	0.54
MH-11	MH-10	18-2	86.57	46.8	86.5	86.07	85.91	86.00	0.57
MH-11	MH-10	18-3	86.57	54.4	86.5	86.07	85.91	86.01	0.56
MH-11	MH-10	20-5	86.66	55.5	86.5	86.07	85.91	86.01	0.65
MH-11	MH-10	20-4	86.66	63.1	86.5	86.07	85.91	86.03	0.63
MH-11	MH-10	20-3	86.66	70.8	86.5	86.07	85.91	86.04	0.62
MH-11	MH-10	20-2	86.66	78.4	86.5	86.07	85.91	86.06	0.60
MH-11	MH-10	20-1	86.66	83.6	86.5	86.07	85.91	86.07	0.59
MH-12	MH-13	11-2	86.5	1.2	11.1	85.80	85.75	85.75	0.75
MH-12	MH-13	11-1	86.5	2.5	11.1	85.80	85.75	85.76	0.74
MH-12	MH-13	10-3	86.5	7.1	11.1	85.80	85.75	85.78	0.72
MH-12	MH-13	10-2	86.5	9.4	11.1	85.80	85.75	85.79	0.71
MH-13	MH-14	16-2	86.34	6.4	21.4	85.75	85.58	85.63	0.71
MH-13	MH-14	16-3	86.34	14.0	21.4	85.75	85.58	85.69	0.65
MH-13	MH-14	11-3	86.5	18.6	21.4	85.75	85.58	85.73	0.77
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.83	85.84	0.70
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.83	85.85	0.69
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.83	85.86	0.68
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.83	85.87	0.67
MH-16	MH-17	13-3	86.27	1.2	10.2	85.83	85.81	85.82	0.45
MH-17	MH-14	16-1	86.34	2.3	52.5	85.81	85.58	85.59	0.75
MH-17	MH-14	15-3	86.37	12.2	52.5	85.81	85.58	85.64	0.73
MH-17	MH-14	12-1	86.27	16.0	52.5	85.81	85.58	85.65	0.62
MH-17	MH-14	15-2	86.37	19.8	52.5	85.81	85.58	85.67	0.70
MH-17	MH-14	12-2	86.27	23.6	52.5	85.81	85.58	85.69	0.58
MH-17	MH-14	15-1	86.37	27.4	52.5	85.81	85.58	85.70	0.67
MH-17	MH-14	12-3	86.27	31.2	52.5	85.81	85.58	85.72	0.55
MH-17	MH-14	13-1	86.27	42.2	52.5	85.81	85.58	85.77	0.50
MH-17	MH-14	13-2	86.27	49.8	52.5	85.81	85.58	85.80	0.47
MH-2	MH-3	3-3	86.52	1.5	13.0	86.05	86.02	86.02	0.50
MH-2	MH-3	3-2	86.52	5.5	13.0	86.05	86.02	86.03	0.49
MH-2	MH-3	26-1	87.49	9.6	13.0	86.05	86.02	86.04	1.45
MH-2	MH-3	3-1	86.52	11.8	13.0	86.05	86.02	86.04	0.48
MH-3	MH-4	5-1	86.44	2.0	33.0	86.02	85.99	85.99	0.45
MH-3	MH-4	4-3	86.49	13.0	33.0	86.02	85.99	86.00	0.49
MH-3	MH-4	4-2	86.49	20.6	33.0	86.02	85.99	86.01	0.48
MH-3	MH-4	4-1	86.49	28.2	33.0	86.02	85.99	86.02	0.47
MH-4	MH-6	5-4	86.44	10.6	31.5	85.99	85.72	85.81	0.63
MH-4	MH-6	5-3	86.44	18.2	31.5	85.99	85.72	85.88	0.56
MH-4	MH-6	5-2	86.44	24.5	31.5	85.99	85.72	85.93	0.51
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.99	86.03	1.48
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.99	86.03	1.46
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.99	86.05	1.46
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.99	86.06	1.43
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.99	86.07	1.44

Table 3: Composite Hydraulic Grade Line Results for 100-Year Design Storms (Fixed Downstream Boundary)

US MH	DS MH	Lot #	USF (m)	Dist from DS MH (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.99	86.07	1.42
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.99	86.09	1.42
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.99	86.10	1.39
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.99	86.11	1.40
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.99	86.12	1.37
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.99	86.13	1.38
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.99	86.14	1.35
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.99	86.16	1.35
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.99	86.17	1.32
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.99	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.99	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.99	86.20	1.31
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.99	86.21	1.28
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.99	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.99	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.99	86.24	0.89
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.99	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.09	85.76	85.81	0.74
MH-7	MH-8	23-12	87.51	12.0	88.3	86.09	85.76	85.81	1.70
MH-7	MH-8	23-11	87.51	18.2	88.3	86.09	85.76	85.83	1.68
MH-7	MH-8	22-2	86.55	19.1	88.3	86.09	85.76	85.83	0.72
MH-7	MH-8	23-10	87.51	25.8	88.3	86.09	85.76	85.86	1.65
MH-7	MH-8	22-3	86.55	26.7	88.3	86.09	85.76	85.86	0.69
MH-7	MH-8	23-9	87.51	30.6	88.3	86.09	85.76	85.88	1.63
MH-7	MH-8	22-4	86.55	34.3	88.3	86.09	85.76	85.89	0.66
MH-7	MH-8	23-8	87.51	38.2	88.3	86.09	85.76	85.90	1.61
MH-7	MH-8	22-5	86.55	41.9	88.3	86.09	85.76	85.92	0.63
MH-7	MH-8	23-7	87.51	44.4	88.3	86.09	85.76	85.93	1.58
MH-7	MH-8	24-12	87.51	52.6	88.3	86.09	85.76	85.96	1.55
MH-7	MH-8	21-1	86.55	52.9	88.3	86.09	85.76	85.96	0.59
MH-7	MH-8	24-11	87.51	60.2	88.3	86.09	85.76	85.99	1.52
MH-7	MH-8	21-2	86.55	60.6	88.3	86.09	85.76	85.99	0.56
MH-7	MH-8	24-10	87.51	65.0	88.3	86.09	85.76	86.00	1.51
MH-7	MH-8	21-3	86.55	68.2	88.3	86.09	85.76	86.02	0.53
MH-7	MH-8	24-9	87.51	72.6	88.3	86.09	85.76	86.03	1.48
MH-7	MH-8	21-4	86.55	75.8	88.3	86.09	85.76	86.04	0.51
MH-7	MH-8	24-8	87.13	77.4	88.3	86.09	85.76	86.05	1.08
MH-7	MH-8	21-5	86.55	83.4	88.3	86.09	85.76	86.07	0.48
MH-7	MH-8	24-7	87.13	85.0	88.3	86.09	85.76	86.08	1.05
MH-8	MH-6	6-1	86.6	11.2	12.7	85.76	85.72	85.76	0.84
MH-9	MH-10	8-1	86.42	8.4	56.0	85.94	85.91	85.92	0.50
MH-9	MH-10	7-3	86.49	19.4	56.0	85.94	85.91	85.92	0.57
MH-9	MH-10	7-2	86.49	27.0	56.0	85.94	85.91	85.92	0.57
MH-9	MH-10	7-1	86.49	34.6	56.0	85.94	85.91	85.93	0.56
MH-9	MH-10	6-3	86.6	45.6	56.0	85.94	85.91	85.93	0.67
MH-9	MH-10	6-2	86.6	53.3	56.0	85.94	85.91	85.94	0.66
								Min	0.45
								Max	1.70
								Average	0.88

5 EROSION AND SEDIMENT CONTROL DURING AND AFTER CONSTRUCTION

Silt and erosion control strategies shall be implemented during construction activities to minimize the transfer of silt off-site. The following measures should be implemented:

i) Silt control fences shall be installed as required to prevent the movement of silt off-site during rainfall events.

ii) Construction of a mud mat shall be installed at the site entrance to promote self-cleaning of truck tires when leaving the site.

iii) All catch basins shall be equipped with a crushed stone filter to prevent the capture of silt in the storm sewer system.

iv) Regular cleaning of the adjacent roads shall be undertaken during the construction activities.

v) Regular inspection and maintenance of the silt control measures shall be undertaken until the site has been stabilized.

vi) The erosion and sediment control devices shall be removed after the site has been stabilized.

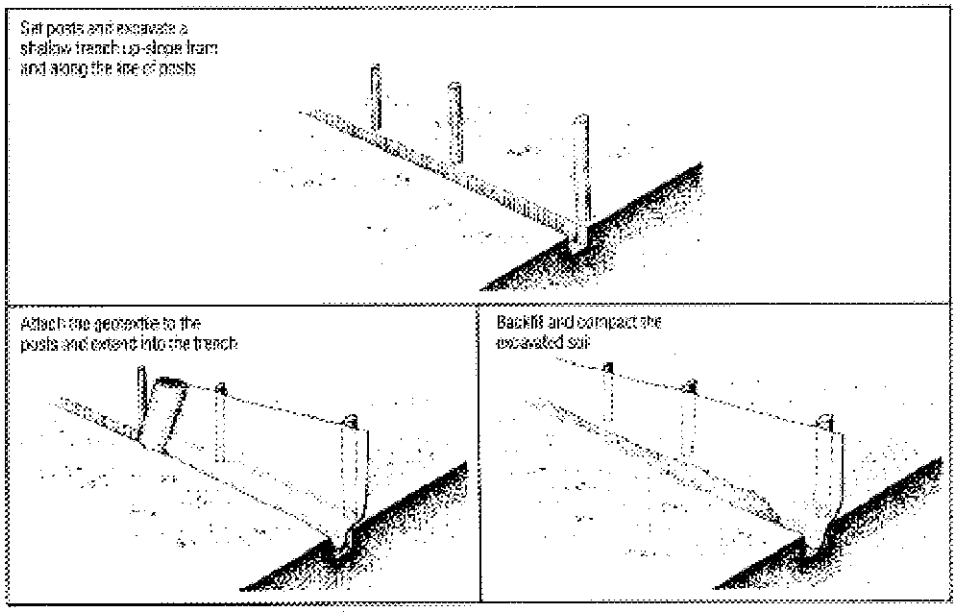


Figure 7: Typical installation of silt fences

6 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The Cassette Subdivision is located off 2275 Mer-Bleue Road, Orleans, within the City of Ottawa. The development has a drainage area of 4.04 ha, which will be treated by the existing Avalon West (N5) SWM Facility, south of Avalon Encore Stage 5, which will provide both the quantity and quality control for the subject site before discharging to McKinnon's Creek to the south.

Per the City of Ottawa design guidelines, the minor system has been designed to accommodate a minimum of the 2-year post-development flows from within the site and from external areas (plus 5-year flows on collector and 10-year flows on arterial roads). The PCSWMM model has determined that the minor system will surcharge in most parts of the system. However, with the use of Inlet Control Devices, a minimum freeboard of 0.3 m is provided between the 100-year hydraulic grade line and the underside of footings throughout the subdivision.

The PCSWMM simulations have determined that for the selected 2-, 5- and 100-year 3-Hour Chicago storms, the total minor system flows from the Cassette development will not exceed the specified 220L/s/ha limit which was set based on previous studies.

Within the subdivision, the peak water depths do not exceed the maximum allowable 35 cm depth at the gutter for the simulated 100-year storm. Furthermore, it was determined that for the 100-year event, the product of the velocity and depth of flow does not exceed the maximum allowable 0.60 m^2/s. Also as required, the maximum extent of surface water during the 100-year + 20% stress test will not touch the building envelopes.

Table C1A- C6B of Appendix C summarizes the hydraulic grade line analysis for the various storm. Note that the full pipe velocities are generally no less than 0.80 m/s and no greater than 3.0 m/s for the proposed pipes.

Stress test results for the major and minor drainage systems based on a 20% increase in the 100-year storm, as per the October 2012 *City of Ottawa Sewer Design Guidelines*, are summarized in Section 4.

Recommendations for silt and erosion control strategies to be implemented during construction are presented in Section 6.

In conclusion, the proposed design satisfies all selected design guidelines and requirements.

Legend

- Site Plan
- Site Area

Minor Outfalls
- MH

Conduits
- Minor System

Minor Junctions
- MH

ICDs
- 83mm Circular Orifice
- 94mm Circular Orifice
- 102mm Circular Orifice
- 108mm Circular Orifice
- 127mm Circular Orifice
- 152mm Circular Orifice
- 178mm Circular Orifice

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.

David Schaeffer Engineering Ltd (DSEL)

Mer Bleue Subdivision

Figure 2: Minor System

PROJECT	2321
DRAWN	JB
DATE	June 2022

C:\OneDrive\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER - Documents\PROJ\2321 ... Report Figures

Legend

- Site Plan
- Site Area
- Major System Conduit
- Major System Junction
- Outfall

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.
Water Resources and Environmental Consultants
52 Springbrook Drive
Ottawa, ON, K2S 1S6
(613) 836-2184
www.jfsa.com

DSEL
david schaeffer engineering ltd

Mer Bleue Subdivision

Figure 3: Major System

PROJECT	2321
DRAWN	MP
DATE	MAY 2022

C:\Users\Mel\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER - Documents\PROJ\2321 221202204 Sub mission\Design\GIS\20220429 Report Figures

Legend

- Site Plan
- Subcatchments
  - <NAME>
  - <AREA>
  - <% IMP>

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.
Water Resources and Environmental Consultants
52 Springbrook Drive
Ottawa, ON, K2S 1S6
(613) 836-2184
www.jfsa.com

DSEL
david schaeffer engineering ltd

Mer Bleue Subdivision

Figure 4: Subcatchments

PROJECT	2321
DRAWN	JB
DATE	June 2022

C:\Users\JFSA OTTAWA SERVER Documents\PROJ\2321 221202206 Submission\GIS\20220622 Report Figures

Legend

- Site Plan
- Site Area
- Surface Storage Volume
- Major System

SCALE: 1:1500

0 25 50 m

J.F. Sabourin and Associates Inc.
Water Resources and Environmental Consultants
52 Springbrook Drive
Ottawa, ON, K2S 1S6
(613) 836 2184
www.jfsa.com

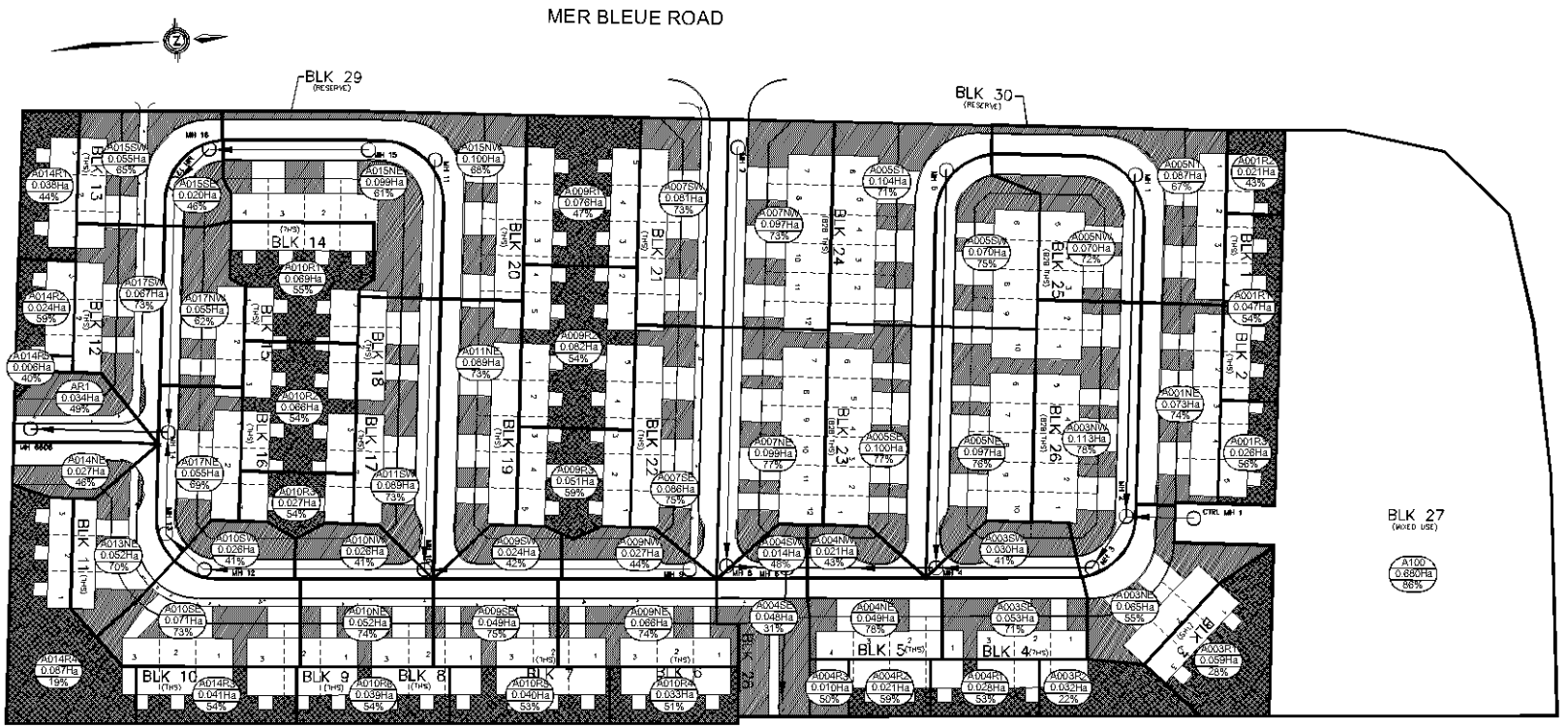
DSEL
david schaeffer engineering ltd

Mer Bleue Subdivision

Figure 5: Extent of Surface Storage

PROJECT	2321
DRAWN	MP
DATE	MAY 2022

C:\Users\J.F. Sabourin and Associates Inc\JFSA OTTAWA SERVER - Documents\PROJ\2321 22\202204 Submit\Design\GIS\20220429 Report Figures



LEGEND

TRIBUTARY BUBBLE ID → A540NE
TOTAL TRIBUTARY AREA IN HECTARES → 0.033Ha
IMPERVIOUSNESS PERCENTAGE → 62%
TOTAL PERVIOUS AREA IN HECTARES → 0.013Ha
FRONT YARD/ROAD PERVIOUS HATCH →
REAR YARD PERVIOUS HATCH →

DSEL
120 Iber Road, Unit 103
Stittsville, Ontario, K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

CAIVAN (MER BLEUE) INC. - CASSETTE SUBDIVISON (2275 MER BLEUE ROAD)

CITY OF OTTAWA

IMPERVIOUSNESS HATCH FIGURE

SCALE:	1:1000	PROJECT No.:	20-1214
DATE:	MAY 2022	FIGURE:	6

000253

APPENDIX

A

Rational Method Design Sheets (as per DSEL)

JFSA Water Resources and Environmental Consultants

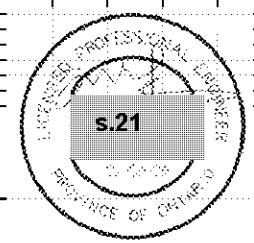
STORM SEWER CALCULATION SHEET (RATIONAL METHOD)

Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency= 10 years

	LOCATION		AREA (Ha) 2 YEAR				AREA (Ha) 5 YEAR				AREA (Ha) 10 YEAR				AREA (Ha) 100 YEAR				FLOW						SEWER DATA							
			AREA		Indiv.	Accum.	AREA		ndiv.	Accum.	AREA		Indiv.	Accum.	AREA		ndiv.	Accum.	Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO
Location	From Node	To Node	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	(Ha)	R	2.78 AC	2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW(min	Q/Q full
ave Broadcast Avenue																																
	7	8	0.36	0.73	0.74	0.74			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	57	450	450	CONC	0.20	88.5	127.5033	0.8017	1.8399	0.444
To voie Ryan Reynolds Way, Pipe 8 - 6						0.74				0.00				0.00				0.00	11.84														
BLOCK 27																																
	100	2			0.00	0.00	0.68	0.80	1.51	1.51			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	158	525	525	CONC	0.25	14.5	215.0311	0.9933	0.2433	0.733
To voie Ryan Reynolds Way, Pipe 2 - 3						0.00				1.51				0.00				0.00	10.24														
BLOCK 28																																
Contribution From voie Ryan Reynolds Way, Pipe 4 - 6						2.22				1.51				0.00				0.00	12.74														
Contribution From voie Ryan Reynolds Way, Pipe 8 - 6						0.74				0.00				0.00				0.00	12.09														
	6	6559			0.00	2.96			0.00	1.51			0.00	0.00			0.00	0.00	12.74	67.67	91.64	0.00	156.85	339	750	750	CONC	0.15	29.0	431.1703	0.9760	0.4952	0.786
voie Ryan Reynolds Way																																
	5	4	0.53	0.71	1.04	1.04			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	80	450	450	CONC	0.20	84.0	127.5033	0.8017	1.7463	0.628
			0.17	0.66	0.30	0.30			0.00	0.00			0.00	0.00			0.00	0.00															
	9	10	0.21	0.57	0.33	0.64			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	49	450	450	CONC	0.25	56.0	142.5531	0.8963	1.0413	0.343
Contribution From ave Broadcast Avenue, Pipe 7 - 8						0.74				0.00				0.00				0.00	11.84														
	8	6			0.00	0.74			0.00	0.00			0.00	0.00			0.00	0.00	11.84	70.40	95.38	0.00	163.32	52	600	600	CONC	0.15	12.5	237.8056	0.8411	0.2477	0.218
To BLOCK 28, Pipe 6 - 6559						0.74				0.00				0.00				0.00	12.09														
	15	16	0.27	0.65	0.50	0.50			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	38	375	375	PVC	0.30	33.5	96.0323	0.8695	0.6421	0.396
	16	17			0.00	0.50			0.00	0.00			0.00	0.00			0.00	0.00	10.64	74.42	100.92	0.00	172.89	37	375	375	PVC	0.30	10.0	96.0323	0.8695	0.1917	0.384
	17	14	0.18	0.67	0.33	0.82			0.00	0.00			0.00	0.00			0.00	0.00	10.83	73.75	99.99	0.00	171.28	61	450	450	CONC	0.20	52.5	127.5033	0.8017	1.0914	0.477
To SCULPIN STREET, Pipe 14 - 6608						0.82				0.00				0.00				0.00	11.93														
			0.07	0.72	0.15	0.15			0.00	0.00			0.00	0.00			0.00	0.00															
	1	2	0.09	0.56	0.15	0.29			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	22	375	375	PVC	0.30	72.0	96.0323	0.8695	1.3801	0.234
Contribution From BLOCK 27, Pipe 100 - 2						0.00				1.51				0.00				0.00	10.24														
	2	3			0.00	0.29			0.00	1.51			0.00	0.00			0.00	0.00	11.38	71.88	97.43	0.00	166.86	168	600	600	CONC	0.15	13.0	237.8056	0.8411	0.2576	0.708
			0.12	0.43	0.14	0.43			0.00	1.51			0.00	0.00			0.00	0.00															
	3	4	0.26	0.67	0.49	0.92			0.00	1.51			0.00	0.00			0.00	0.00	11.64	71.04	96.27	0.00	164.86	211	675	675	CONC	0.15	33.0	325.5584	0.9098	0.6045	0.648
			0.03	0.59	0.05	2.01			0.00	1.51			0.00	0.00			0.00	0.00															
	4	6	0.13	0.57	0.21	2.22			0.00	1.51			0.00	0.00			0.00	0.00	12.24	69.15	93.67	0.00	160.37	295	675	675	CONC	0.20	31.5	375.9224	1.0505	0.4998	0.785
To BLOCK 28, Pipe 6 - 6559						2.22				1.51				0.00				0.00	12.74														
	11	10	0.18	0.71	0.35	0.35			0.00	0.00			0.00	0.00			0.00	0.00	10.00	76.81	104.19	0.00	178.56	27	375	375	PVC	0.30	86.5	96.0323	0.8695	1.6581	0.281
			0.11	0.57	0.18	1.16			0.00	0.00			0.00	0.00			0.00	0.00															
			0.16	0.58	0.26	1.43			0.00	0.00			0.00	0.00			0.00	0.00															
	10	12	0.18	0.65	0.32	1.74			0.00	0.00			0.00	0.00			0.00	0.00	11.66	70.98	96.18	0.00	164.70	124	525	525	CONC	0.20	46.5	192.3297	0.8885	0.8723	0.643
	12	13			0.00	1.74			0.00	0.00			0.00	0.00			0.00	0.00	12.53	68.29	92.49	0.00	158.32	119	525	525	CONC	0.20	11.0	192.3297	0.8885	0.2063	0.618
	13	14	0.05	0.69	0.10	1.84			0.00	0.00			0.00	0.00			0.00	0.00	12.74	67.68	91.66	0.00	156.89	125	525	525	CONC	0.20	21.5	192.3297	0.8885	0.4033	0.648
To SCULPIN STREET, Pipe 14 - 6608						1.84				0.00				0.00				0.00	13.14														
SCULPIN STREET																																
Contribution From voie Ryan Reynolds Way, Pipe 13 - 14						1.84				0.00				0.00				0.00	13.14														
Contribution From voie Ryan Reynolds Way, Pipe 17 - 14						0.82				0.00				0.00				0.00	11.93														
			0.03	0.54	0.04	2.71			0.00	0.00			0.00	0.00			0.00	0.00															
	14	6608	0.13	0.41	0.15	2.85			0.00	0.00			0.00	0.00			0.00	0.00	13.14	66.54	90.09	0.00	154.18	190	675	675	CONC	0.15	29.0	325.5584	0.9098	0.5313	0.583

Definitions:
Q = 2.78 AIR, where
Q = Peak Flow in Litres per second (L/s)
A = Areas in hectares (ha)
I = Rainfall Intensity (mm/h)
R = Runoff Coefficient

Notes:
1) Ottawa Rainfall-Intensity Curve
2) Min. Velocity = 0.80 m/s



Designed: A.K.	PROJECT: CASSETTE SUBDIVISION (2275 MER BLEUE ROAD)		
Checked: W.L.	LOCATION: City of Ottawa		
Dwg. Reference: Storm Drainage Plan Dwg. 19	File Ref: 20-1214	Date: Jun 2022	Sheet No. SHEET 1 OF 1

1214_STM_DesSheet2.xlsx

APPENDIX

B

Background Documentation

STORM SEWER COMPUTATION FORM — **Table 1**

DESIGNED BY: PLM
CHECKED BY: AGS

PROJECT: **Neighbourhood 5 - Avalon Encore - Western Trunk**
CLIENT: Minto Communities Inc.
PROJECT #: 170401
BY: ATREL ENGINEERING LTD
DATE: March, 2017

STORM FREQUENCY: 5 & 10 YEAR
RATIONAL METHOD Q= 2.78 AIR
PVC/CONC N= 0.013
CSP N= 0.024
CORR N= 0.021

STREET NAMES	LOCATION FROM (Up)		TO (Down)		0.20	0.30	0.50	0.55	0.59	0.60	0.65	0.66	0.66	0.70	0.70	0.75	0.76	0.80	RATIONAL METHOD INDIV. 2.78AR	RATIONAL METHOD ACCUM. 2.78AR	5 YEAR TIME CONC. (MIN)	5 YEAR RAINF. INTENS. (MM/HR)	5 YEAR FLOW (L/S)	Rational Method 10 year ACCUM 2.78AR (L/S)	Rational Method 10 year RAINF. INTENS. (MM/HR)	Rational Method 10 year FLOW (L/S)	ACTUAL PIPE FLOW (L/S)	PIPE TYPE	PIPE DIA. (NOM) (mm)	PIPE DIA. (ACT)	SEWER DATA SLOPE (%)	SEWER DATA LENGTH (M)	SEWER DATA CAP. (L/S)	SEWER DATA Remaining Capacity (%)	SEWER DATA VEL. (M/S)	SEWER DATA TIME OF FLOW (MIN)	UpStream Obv. (M)	UpStream Inv. (M)	DwnStream Obv. (M)	DwnStream Inv. (M)
Jerome Jodoin	MH	237	MH	607										2.00	4.20				23.03	23.03	23.59	63.25	1456.95	8.29	73.99	613.37	2070.33	CONC	900	1828.8			2792.13	45%	1.49	1.30	95.51	93.81	95.49	93.69
Jerome Jodoin	MH	607	MH	630															0.68	23.72	24.97	60.94	1445.25	8.29	71.26	590.91	2036.15	CONC	900	1828.8			2792.13	46%	1.49	1.19	95.49	93.69	95.39	93.59
																					26.10																			
Aquarium Avenue	MH	6501	MH	6502								0.38							0.38	0.38	10.00	104.19	39.54		122.14		39.54	PVC	300	366.4		84.05	53%	0.80	1.43	86.02	85.65	85.94	85.47
Aquarium Avenue	MH	6502	MH	6503								0.34							0.72	1.10	11.43	97.19	70.25		118.90		70.25	CONC	300	457.2		133.02	47%	0.81	1.46	86.84	86.39	86.70	86.25
Aquarium Avenue	MH	6503	MH	6504															0.72	1.82	12.91	90.87	65.75		106.57		65.75	CONC	300	533.4		179.46	63%	0.90	0.29	85.70	85.18	85.66	85.18
Aquarium Avenue	MH	6504	MH	6510								0.96							1.68	3.50	13.15	90.05	151.71		106.48		151.71	CONC	600	609.6		248.09	39%	0.95	1.33	85.68	85.09	85.58	84.99
																					14.49																			
Stickleback Way	MH	6507	MH	6508															0.52	0.52	10.00	104.19	54.60		122.14		54.60	CONC	300	457.2		133.02	59%	0.81	0.73	86.80	86.35	86.73	86.28
Stickleback Way	MH	6508	MH	6509															0.52	1.04	10.73	100.48	52.66		117.78		52.66	CONC	300	457.2		133.02	60%	0.81	0.23	86.70	86.25	86.68	86.23
Stickleback Way	MH	6509	MH	6510								0.55							1.07	2.11	10.96	99.40	106.63		116.49		106.63	CONC	600	609.6		233.61	54%	0.80	1.56	86.66	85.08	86.58	84.98
																					12.52																			
Aquarium Avenue	MH	6510	MH	6511															2.76	2.76	14.49	85.26	235.01		99.85		235.01	CONC	525	838.2		473.55	50%	0.96	1.22	85.58	84.76	85.52	84.70
Aquarium Avenue	MH	6511	MH	6512								0.78							5.53	8.29	15.71	81.33	287.37		96.24		287.37	CONC	600	914.4		597.22	52%	0.91	0.92	85.52	84.62	85.47	84.57
																					16.63																			
Aquarium Avenue	MH	6512	MH	6513								1.50							1.50	9.79	10.00	104.19	156.41		122.14		156.41	CONC	600	609.6		233.61	33%	0.80	2.06	85.60	85.00	85.47	84.87
																					12.06																			
Shiner Lane	MH	6513	MH	630								1.33							6.37	16.16	16.83	78.65	500.92		92.08		500.92	CONC	1200	1219.2		1286.19	61%	1.10	1.11	85.47	84.27	85.40	84.20
																					17.74																			
Jerome Jodoin	MH	630	MH	631															0.58	30.67	26.40	59.20	1815.59	8.29	69.23	573.91	2389.50	CONC	1200	1981.2		4694.42	49%	1.62	0.76	85.40	83.45	85.33	83.38
Jerome Jodoin	MH	631	MH	631A															0.88	31.26	26.86	59.09	1846.46	8.29	67.93	563.14	2378.59	CONC	1200	1981.2		4694.42	49%	1.62	0.83	86.39	83.33	85.25	83.20
Jerome Jodoin	MH	631A	MH	669															0.43	31.68	27.88	58.93	1803.56	8.29	66.57	551.86	2355.44	CONC	1200	1981.2		4694.42	50%	1.62	1.16	86.25	83.30	85.14	83.19
																					28.83																			
Aquarium Avenue	MH	6550	MH	6551								0.86							0.86	0.86	10.00	104.19	89.94		122.14		89.94	CONC	300	533.4		179.46	50%	0.80	1.55	86.96	85.46	86.86	85.34
Aquarium Avenue	MH	6551	MH	6560								1.33							2.19	3.05	11.55	96.69	211.93		113.29		211.93	CONC	600	762.0		357.27	42%	0.81	1.79	85.86	85.11	85.77	85.02
																					13.34																			
Commercial	MH	6559	MH	6560															4.89	4.89	15.00	83.56	408.84		97.85		408.84	CONC	900	990.6		799.33	48%	0.96	0.86	85.83	84.84	85.77	84.80
																					15.86																			
Aquarium Avenue	MH	6560	MH	6570								0.87							7.75	12.64	15.86	81.48	631.75		95.41		631.75	CONC	1200	1066.8		900.87	30%	1.01	0.63	85.77	84.72	85.72	84.67
																					16.49																			
Stickleback Way	MH	6564	MH	6565								0.54							0.54	0.54	10.00	104.19	56.48		122.14		56.48	PVC	300	366.4		84.05	33%	0.80	1.53	86.00	85.55	85.94	85.47
Stickleback Way	MH	6565	MH	6566															0.54	1.08	11.51	95.86	52.51		119.51		52.51	CONC	300	457.2		133.02	61%	0.81	0.25	85.94	85.39	85.82	85.27
Stickleback Way	MH	6566	MH	6570								0.49							1.03	2.11	11.75	95.77	98.64		112.22		98.64	CONC	600	533.4		179.46	45%	0.80	1.33	85.62	85.00	85.72	85.20
																					13.08																			
Aquarium Avenue	MH	6570	MH	6571								1.05							9.83	11.94	16.49	79.04	776.86		92.54		776.86	CONC	1200	1219.2		1286.19	40%	1.10	1.07	85.72	84.52	85.65	84.45
Aquarium Avenue	MH	6571	MH	6572															9.83	21.77	17.56	76.10	747.96		89.09		747.96	CONC	1200	1371.6		1760.81	58%	1.19	0.19	85.65	84.30	85.64	84.29
Aquarium Avenue	MH	6572	MH	6573								1.01							10.84	32.61	17.75	75.61	819.66		88.51		819.66	CONC	1200	1371.6		1760.81	53%	1.19	1.68	85.51	84.26	85.49	84.14
Aquarium Avenue	MH	6573	MH	6574															10.84	43.45	19.43	71.60	774.43		83.79		774.43	CONC	1200	1371.6		1760.81	56%	1.19	0.30	85.36	84.11	85.36	84.10
Aquarium Avenue	MH	6574	MH	6575								0.69							11.73	55.18	19.62	71.09	833.70		83.19		833.70	CONC	1200	1371.6		1760.81	53%	1.19	0.48	85.42	84.07	85.39	84.04
Aquarium Avenue	MH	6575	MH	6580															11.73	66.91	20.10	70.03	821.27		81.96		821.27	CONC	1200	1371.6		1760.81	53%	1.19	0.39	85.39	84.04	85.36	84.01
																					20.49																			
Damselfish Walk	MH	6578	MH	6579								1.96							1.96	1.96	10.00	104.19	204.49		122.14		204.49	CONC	300	533.4		339.63	40%	0.92	2.18	85.89	85.02	85.51	84.84
Damselfish Walk	MH	6579	MH	6580								0.53							2.49	4.45	12.18	93.95	233.76		110.08		233.76	CONC	600	762.0		449.81	48%	0.99	1.72	85.51	84.76	85.39	84.61
																					13.89																			
Aquarium Avenue	MH	6580	MH	6581								0.93							15.16	19.61	20.49	69.19	1048.20		90.67		1048.20	CONC	1200	1524.0		2278.61	56%	1.30	0.93	85.36	83.99	85.28	83.92
Aquarium Avenue	MH	6581	MH	6615															15.16	34.77	21.42	67.29	1018.42		78.75		1018.42	CONC	1200	1524.0		2392.02	58%	1.28	0.26	85.28	83.76	85.23	83.63
																					21.67																			
Deceaur Drive	MH	6605	MH	6610								0.99							0.99	0.99	10.00	104.19	101.67		122.14		101.67	CONC	300	533.4		200.65	49%	0.90	1.32	85.82	85.10	85.49	84.96
																					11.32																			
Scalpin Street	MH	6608	MH	6609														0.00	5.46	5.46	15.00	83.56	456.46		97.85		456.45	CONC	600	990.6		799.33	38%	0.96	2.01	85.68	84.71	85.58	84.59
Scalpin Street	MH	6609	MH	6610															0.10	5.56	17.01	77.59	431.40		90.83		431.40	CONC	600	1066.8		900.87	52%	1.01	0.30	85.58	84.51	85.54	84.49
																					17.30																			
Deceaur Drive	MH	6610	MH	6611								0.53							7.06	12.62	17.30	76.78	542.16		89.86		542.16	CONC	600	1066.8		900.87	40%	1.01	0.95	85.48	84.43	85.43	84.38
Deceaur Drive	MH	6611	MH	6612								1.20							8.26	20.88	18.16	74.59	615.98		87.29		615.98	CONC	1200	1219.2		1286.19	52%	1.10	1.91	85.43	84.23	85.34	84.14
Deceaur Drive	MH	6612	MH	6615								0.86							9.12	30.00	19.46	71.46	661.31		83.62		551.31	CONC	1200	1219.2		1286.19	49%	1.10	1.84	85.34	84.14	85.23	84.03
																					21.11																			
Deceaur Drive	MH	6615	MH	668								1.10							35.36	65.36	21.67	66.80	1694.08		78.15		1694.08	CONC	900	1676.4		3731.42	55%	1.69	0.61	86.23	83.58	86.13	83.48
																					22.28																			
Jerome Jodoin	MH	668	MH	669								0.83							57.87	123.23	28.83	55.39	3205.55	8.29	64.76	536.86	3742.41	CONC	1200	2286.0		6875.59	38%	1.68	0.92	86.13	82.88	85.95	82.90
Jerome Jodoin	MH	669	MH	683								1.32							69.20	192.43	29.85	54.36	3217.28	8.29	63.54	526.74	3744.00	CONC	1200	2286.0		6875.59	46%	1.68	0.77	85.95	82.80	84.97	82.72
																					30.42																			
Mer Bleue	MH	Stub 2	MH	542															6.67	6.67	25.56	60.01	400.22	6.66	70.19	466.21	866.43	CONC	900	1066.8		2073.95	59%	2.32	0.50	84.50	83.46	84.13	83.09
																					26.07																			
Gardenpost	MH	542	MH	543															6.67	13.34	26.07	59.35	395.15	6.66	69.39	454.31	849.45	CONC	900	1219.2		1575.26	46%	1.36	0.14	84.22	83.02	84.20	83.00
Gardenpost	MH	543	MH	544								0.60							7.27	20.61	26.21	59.03	429.29	6.66	69.04	462.87	891.95	CONC	900	1219.2		1575.26	44%	1.35	0.81	84.14	82.94	84.04	82.84
Gardenpost	MH	544	MH	550								1.18							8.45	29.06	27.03	57.86	466.99	6.66	67.86	453.62	922.61	CONC	900	1219.2		1575.26	41%	1.35	1.06	84.04	82.84	83.91	82.71
Gardenpost	MH	550	MH	565								0.98							9.41	38.47	28.07	56.39	530.49	6.66	66.94	452.34	982.83	CONC	900	1524.0		2366.14	58%	1.67	0.92	84.21	82.71	84.09	82.59
																					28.89																			
Gardenpost	MH	6625	MH	6627								0.37							0.37	0.37	10.00	104.19	38.62		122.14		38.62	CONC	300	457.2		133.02	71%	0.81	0.71	85.36	84.90	85.29	84.83
																					10.71																			
Site Plan	MH	6626	MH	6627															1.80	1.80	15.00	83.56	150.53		97.85		150.53	CONC	600	533.4		245.74	39%	1.10	0.15	85.16	84.64	85.13	84.61
																					16.16																			
Gardenpost	MH	6627	MH	6628															2.17	3.97	15.15	83.07	180.36		97.28		180.36	CONC	600	609.6		248.09	27%	0.95	0.39	85.13	84.53	85.10	84.50
Gardenpost	MH	6628	MH	6629															2.17	6.14	15.53	81.67	177.75		96.87		177.75	CONC	600	609.6		248.09	28%	0.95	0.31	85.07	84.47	85.05	84.45
Gardenpost	MH	6629	MH	6635								0.28							2.37	8.51	15.74	81.28	192.65		96.13		192.65	CONC	600	609.6		248.09	22%	0.95	0.79	85.02	84.42	84.98	84.38
																					16.53																			
Park	MH	6634	MH	6635								0.74							0.74	0.74	15.00	83.56	62.02		97.85		62.02	PVC	300	366.4		84.05	26%	0.80	0.23	84.99	84.82	84.96	84.59
																					16.29																			
Gardenpost	MH	6635	MH	6636								1.42							4.53	5.27	16.83	78.91	357.79		92.39		357.79	CONC	600	914.4		597.22	40%	0.91	2.11	84.96	84.06	84.84	83.94
Gardenpost	MH	6636	MH	6640								0.53							5.06	10.33	18.94	73.38	371.27		85.89		371.27	CONC	600	914.4		597.22	38%	0.91	1.44	84.84	83.94	84.76	83.86
																					20.08																			
Guppy Grove	MH	6639	MH	6640															0.76	0.76	10.00	104.19	79.66		122.14		79.66	CONC	300	457.2		133.02	40%	0.81	1.30	84.44	83.99	84.31	83.86
																					11.20																			
Guppy Grove	MH	6640	MH	665								0.93							6.76	7.69	20.08	70.08	473.42		82.00		473.42	CONC	900	1066.8		900.87	47%	1.01	1.22	84.31	83.26	84.24	83.19
																					21.20																			
Gardenpost	MH	666	MH	683								0.35							16.51	24.20	28.89	55.32	913.81	6.66	64.67	424.02	1337.83	CONC	900	1676.4		3682.64	64%	1.67	0.72	84.24	82.59	84.13	82.48
																					29.62																			
Jerome Jodoin	MH	683	MH	690															0.88	25.09	30.42	53.42	2001.50	14.85	62.46	927.17	5018.45	CONC	1200	2590.8		9599.83	48%	1.82	0.41	84.97	82.43	84.92	82.37
Unopen Road allowance	MH	690	MH	691																25.09	30.83	52.94	1864.53	14.85	61.86	918.21	4973.23	CONC	1200	2590.8		9599.83	48%	1.82	0.52	84.92	82.32	84.91	82.26
Unopen Road allowance	MH	691	MH	691A								0.18							25.27	50.36	31.67	52.32	4018.41	14.85	61.16	908.02	4944.43	CONC	1200	2590.8		9599.83	49%	1.82	1.10	84.91	82.26	84.69	82.14
Unopen Road allowance	MH	691A	MH	691B								0.13							76.90	102.26	32.47	51.10	3929.38	14.85	59.75	886.79	4816.17	CONC	1200	2590.8		9599.83	50%	1.82	0.46	84.64	82.09	84.59	82.04
																					32.92																			
Mattamy	MH	99	MH	691B															37.50	37.50	22.51	65.18	2444.47		76.26		2444.47	CONC	1050	1981.2		5142.48	52%	1.67	0.80	84.71	82.75	84.61	82.65
																					23.31																			
Unopen Road allowance	MH	691B	MH	W.F.S															0.19	114.59	32.92	50.82	5800.74	14.85	59.16	878.32	6679.06	CONC		SAME		15688.99	57%	1.94	0.43	84.61	81.91	84.56	81.86
																					20.04																			

Proposed storm sewers
Existing storm sewers

J.F. Sabourin and Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS

52 Springbrook Drive
Ottawa (Stittsville), ON K2S 1B9
TEL: (613) 836- 3884
FAX: (613) 836- 0332
WEB: www.jfsa.com

March 26, 2021

David Schaeffer Engineering Limited
120 Iber Road, Unit 103
Stittsville, Ontario K2S 1E9

Attention: **Ms. Jennifer Ailey, P.Eng.**

Subject: **2275 Mer Bleue Road / Preliminary Stormwater Management Design**

our file: 1102-13

As requested by your office, we have evaluated, based on the available information as described below, the preliminary hydraulic gradeline results for the storm sewer servicing the 2275 Mer Bleue Road site.

The 2275 Mer Bleue Road site is located within the Avalon West subdivision, and is serviced by a storm sewer through the Avalon West subdivision to the existing Avalon West Stormwater Management (SWM) facility, which discharges to McKinnon's Creek. The 2275 Mer Bleue Road site has been accounted for in the sizing of the Avalon West storm sewers and pond, as designed by IBI Group. Note that an interim expansion of the existing SWM facility has been constructed in support of the Summerside South Phase 1 subdivision, in advance of improvements to downstream McKinnon's Creek, as per the June 2019 *Design Brief for Interim Expansion of the Avalon West Stormwater Management Pond for the Summerside South Phase 1 Subdivision* by DSEL/JFSA.

Preliminary hydraulic gradeline calculations for the proposed storm sewer within the 2275 Mer Bleue Road site were performed using spreadsheet calculations and are presented in Table 1. Pipe data, storm sewer layout and Rational Method flows in the storm sewer are as provided by DSEL. The Rational Method flows were calculated based on the 2-, 5- or 10-year level of service requirements, and the 100-year flows in the hydraulic gradeline calculations were estimated as 14% greater than the Rational Method flows, to account for the additional flows captured by catchbasin grates, lead pipes and / or inlet control devices under the higher surface water depths of the 100-year storm.

The 100-year boundary hydraulic gradeline elevations at the two storm sewer outlets from the site to the Avalon West storm sewer were set to match the highest simulated under the 100-year 3-hour Chicago and 100-year 24-hour SCS Type II design storms, from either the design by IBI Group or the modelling completed in support of the interim pond expansion - that is, from the March 13, 2018 *Avalon West Stage 6 Major System Stormwater Analysis* memo by IBI Group or the June 2019 *SWM Report for Summerside South Phase 1* by JFSA (for which detailed modelling of the Avalon West subdivision was incorporated into the overall model by IBI Group on Sept. 6, 2018),

As may be seen in Table 1, a freeboard of 0.3 m between the hydraulic gradeline and the estimated underside of footing elevations (estimated as 1.8 m below ground level) has been provided throughout the proposed development.

Yours truly,
J.F. Sabourin and Associates Inc.

Laura Pipkins, P.Eng.

cc: J.F. Sabourin, M.Eng, P.Eng.
Director of Water Resources Projects

Table 1: Storm Sewer Hydraulic Gradeline Calculations

Pipe Parameters											Flow Characteristics			Friction and Minor Losses						HGL Computations			USF Check	
Manhole Number		Invert Elevation		Diameter	Length	MH Cover Elev. u/s	MH Cover Elev. d/s	Width	Slope	n	Qcap	Flow [1]	V actual Q/a	per Darcy-Weisbach f	per Darcy-Weisbach H_L	Friction Losses	Minor Loss Coefficient	Minor Losses	Losses	Surch. (u/s)	HGL (u/s)	HGL (d/s)	USF [2]	Freeboard To USF
(u/s)	(d/s)	(u/s)	(d/s)																					
		(m)	(m)	(mm)	(m)	(m)	(m)	(mm)	(%)		(L/s)	(L/s)	(m/s)		(m)	(m)		(m)	(m)	(m)	(m)	(m)		(m)
1	3	85.95	85.71	375	78.5	88.45	88.42	N/A	0.30	0.013	96	68	0.949	0.029	0.119	0.119	0.39	0.018	0.137	-0.142	86.178	85.881	86.65	0.472
2	3	85.66	85.56	525	28.0	88.41	88.41	N/A	0.35	0.013	254	203	1.307	0.026	0.063	0.063	0.47	0.041	0.103	-0.171	86.011	85.881	86.61	0.599
3	4	85.41	85.39	675	16.0	88.42	88.52	N/A	0.15	0.013	326	273	1.022	0.024	0.017	0.017	0.39	0.021	0.038	-0.203	85.881	85.821	86.62	0.739
4	6	85.33	85.27	675	37.0	88.52	88.37	N/A	0.15	0.013	326	290	1.029	0.024	0.044	0.044	0.02	0.001	0.045	-0.179	85.821	85.713	86.72	0.899
5	6	85.82	85.57	375	82.0	88.35	88.35	N/A	0.30	0.013	96	72	0.955	0.029	0.138	0.138	1.33	0.062	0.200	-0.133	86.057	85.713	86.55	0.493
6	7	85.19	85.16	750	22.0	88.37	88.54	N/A	0.15	0.013	431	356	1.093	0.023	0.023	0.023	1.33	0.081	0.103	-0.231	85.713	85.496	86.57	0.857
7	Ex. MH 6559	84.94	84.90	750	24.0	88.60	88.37	N/A	0.15	0.013	431	355	1.096	0.023	0.024	0.024	0.02	0.001	0.026	-0.190	85.496	85.47	86.80	1.304
9	10	85.83	85.50	375	92.5	88.50	88.45	N/A	0.35	0.013	104	89	1.057	0.029	0.238	0.238	1.33	0.076	0.313	-0.108	86.095	85.702	86.70	0.605
10	12	85.28	85.20	600	52.5	88.61	88.32	N/A	0.15	0.013	238	118	0.847	0.025	0.020	0.020	0.02	0.001	0.020	-0.177	85.702	85.682	86.81	1.108
11	12	85.71	85.43	375	94.0	88.34	88.30	N/A	0.30	0.013	96	78	0.975	0.029	0.188	0.188	1.33	0.064	0.252	-0.119	85.963	85.682	86.54	0.577
12	13	85.13	85.04	675	54.5	88.32	88.35	N/A	0.15	0.013	326	212	0.973	0.024	0.035	0.035	0.39	0.019	0.054	-0.118	85.682	85.628	86.52	0.838
13	14	84.98	84.96	675	13.5	88.35	88.42	N/A	0.15	0.013	326	221	0.978	0.024	0.009	0.009	0.39	0.019	0.028	-0.030	85.628	85.600	86.55	0.922
14	18	84.90	84.86	675	26.0	88.42	88.30	N/A	0.15	0.013	326	239	0.999	0.024	0.021	0.021	1.33	0.068	0.089	0.022	85.600	85.511	86.62	1.020
15	16	85.35	85.22	375	44.5	88.28	88.07	N/A	0.30	0.013	96	26	0.743	0.029	0.009	0.009	0.39	0.011	0.020	-0.142	85.583	85.563	86.48	0.897
16	17	85.14	85.11	450	15.5	88.07	88.26	N/A	0.20	0.013	128	33	0.682	0.027	0.002	0.002	0.39	0.009	0.011	-0.028	85.563	85.552	86.27	0.707
17	18	84.96	84.88	600	54.0	88.26	88.30	N/A	0.15	0.013	238	71	0.743	0.025	0.007	0.007	1.19	0.034	0.041	-0.008	85.552	85.511	86.46	0.908
18	Ex. MH 6608	84.80	84.77	675	22.5	88.20	88.04	N/A	0.15	0.013	326	302	1.037	0.024	0.029	0.029	0.035	0.002	0.031	0.032	85.511	85.48	86.40	0.889

Note: 100-year HGL at existing MH 6608 and MH 6559 as modelled in the June 2019 *SWM Report for Summerside South Phase 1*, for which detailed modelling of the Avalon West subdivision was incorporated into the overall model by IBI Group on Sept. 6, 2018, or as per the March 13, 2018 *Avalon West Stage 6 Major System Stormwater Analysis* memo by IBI Group, whichever is higher.

[1] Flow set equal to Rational Method flows (per DSEL) + 14% to account for additional flows captured during the 100-year storm.

[2] USF estimated as 1.8 m below the upstream manhole cover elevation.

Products – StormTech Orifice Plate

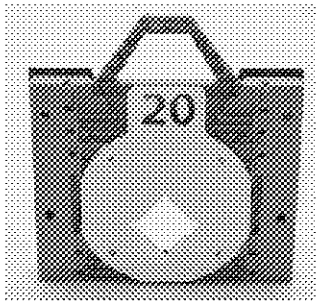
Our StormTech Orifice Plate uses a calibrated orifice to control the outflow at a specific rate at a specific head in the catch basin. This is our simplest and most economical Inlet Control Device (ICD), and can be sometimes used by municipalities as a starting point for storm water management until more information is gathered. As with all our products, it can be swapped out with another StormTech ICD once more is known about the system.

Orifice Plate units can have any shape or size of orifice customized to meet your needs. Standard designs include Round, Diamond, Keyhole and Diamond Keyhole shaped orifices. Keyholes help create a torsional flow pattern through the orifice that can help unblock some debris.

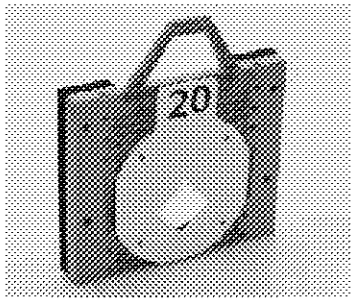
Orifice plate ICD's do not form water traps to prevent odours and are also prone to blockage by floatables like leaves, twigs, bottles and cans, especially during higher rainfall periods. Monitoring of these types of installs is recommended and sometimes leads to recommendations to upgrade to water trap devices, such as Odour Traps and Sumps, to prevent blockage and odours. But in locations where they work properly they are an economical alternative solution.

Primary Function(s):	Flow Control for Medium to High Flow Rates (15 to 100 l/s | 237 to 1585 GPM).
Other Functions(s):	None.
Outflow Pipe Diameter:	150 mm to 300 mm | 6 inch to 12 inch. Special orders can be made for larger sizes.
Catch Basin Types:	All – with or without sumps. Rectangular or Round Catch Basins (Round requires built-in adapter that can be provided). Standard Round is 600 mm, but larger sizes available (900 mm, 1200 mm, 1600 mm ...etc.). Fits through even small Catch Basin openings (300 mm x 450 mm).
Specifications:	**Orifice Plate:** HDPE Thermoplastic with UV resistant additives. **Handle Plate (common):** HDPE Thermoplastic. **Handle Plate (common):** HDPE Thermoplastic. **Mounting Plate (common):** HDPE Thermoplastic. **Hardware (common):** Stainless Steel Wedge Bolts with Nut and Washer (4). **Welds:** None. **Inner Ring Seal:** Rubber Bulb Seal EPDM. Held in place and reusable. No need to replace. **Wall Seal:** 3/8 or 5/8 inch Neoprene closed cell sponge gasket attached to Mounting Plate. **Identifier:** 50 mm high numeric's on top of unit. Peel and stick. Note: Not visible from street surface. **Special Tools:** None required. **Weight:** Removable Unit: 0.5 kg / 1 lb. Maximum Total Assembly: 2.3 kg / 5 lb.

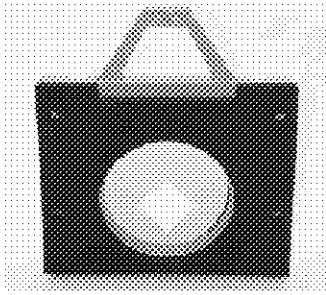
Orifice Plate – Square Adapter (with Diamond Orifice pictured)



Front

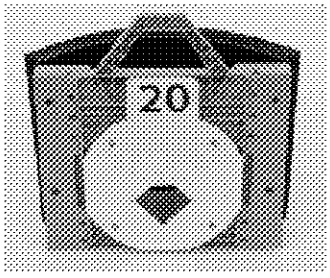


Left Angle

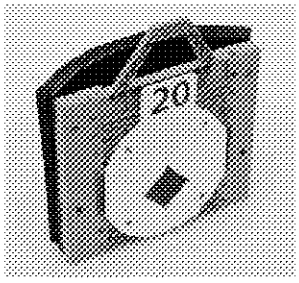


Back – View from Wall

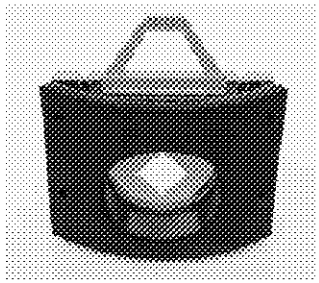
Orifice Plate – Round Adapter



Front



Left Angle



Back – View from Wall

Installation:

1. If necessary, cut protruding out-flowing pipe back flush to Catch Basin wall.
2. Use Mounting Plate as template to mark four hole pattern on Catch Basin wall.
3. Install four Stainless Steel Wedge Bolts (provided) perpendicular to Mounting Plate.
4. Install Mounting Plate and hand secure with four washers and nuts (provided).
5. Torque nuts to 40 N-·m or 30 lbf·ft. Do not over-tighten.
6. Snap unit into place by pushing Handle Plate into dove-tail slot of Mounting Plate.
7. Record Unit Identifier along with Catch Basin Location according to municipal requirements.
8. Note – Unit Identifier with this model is NOT easily seen from street level.

Table B-1: Plas-Tech StormTech Orifice Plate Inlet Control Device (ICD) Capacities [1]

ICD Diameter (mm)	Capture (L/s)							
	CB (1.38 m lead pipe invert depth)				CBMH (1.74 m lead pipe invert depth)			
Water Depth:	*0 cm*	*Average*	*30 cm*	*35 cm*	*0 cm*	*Average*	*30 cm*	*35 cm*
Head:	*1.28 m*	*1.4 m*	*1.58 m*	*1.63 m*	*1.64 m*	*1.76 m*	*1.94 m*	*1.99 m*
83	17.6	18.4	19.6	19.9	19.9	20.7	21.7	22.0
94	22.6	23.6	25.1	25.5	25.6	26.5	27.8	28.2
102	26.6	27.8	29.6	30.0	30.1	31.2	32.8	33.2
108	29.8	31.2	33.2	33.7	33.8	35.0	36.7	37.2
127	41.3	43.2	45.8	46.6	46.7	48.4	50.8	51.5
152	59.1	61.8	65.7	66.7	66.9	69.3	72.8	73.7
178	81.1	84.8	90.1	91.5	91.8	95.0	99.8	101.1

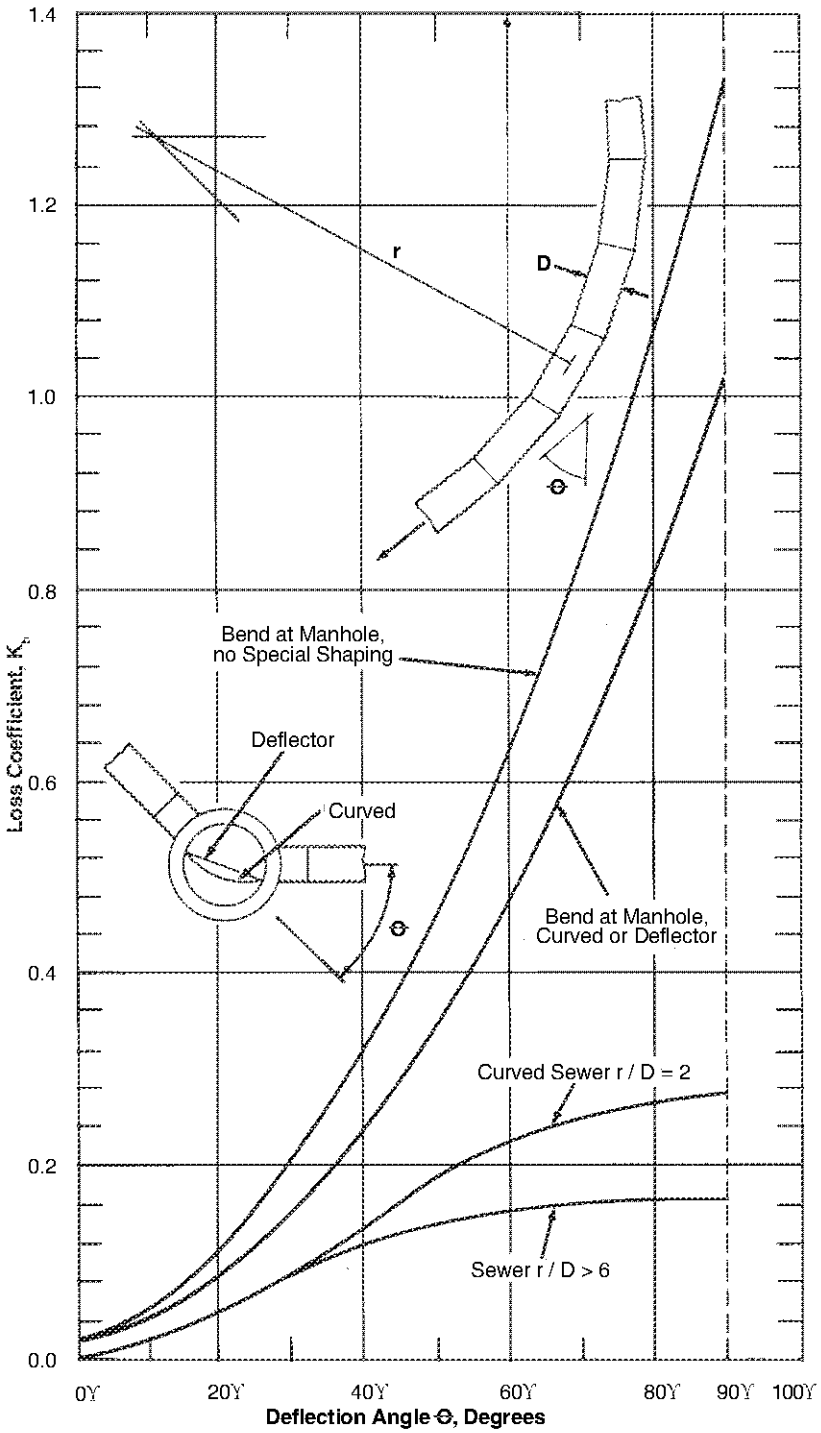
[1] For circular orifices plate type with diameters as specified by City of Ottawa standards.

APPENDIX C

Modelling Reference Tables

Pipe Data and Hydraulic Simulation Results

MANHOLE LOSS COEFFICIENT NOMOGRAPH AND TABLE



Angle	Exit Loss
0	0.02
5	0.035
10	0.055
15	0.08
20	0.11
25	0.16
30	0.21
35	0.26
40	0.32
45	0.39
50	0.47
55	0.54
60	0.635
65	0.73
70	0.84
75	0.95
80	1.07
85	1.19
90	1.33

Figure 4.13 Sewer bend loss coefficient[16]

Table C1A: Pipe Data and Hydraulic Simulation Results - 100-Year Chicago 3 Hour Event

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n (-)	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To peak (hh:mm)	Max U/S HGL (m)	Max D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.35	-0.22	01/01/2019 01:18 AM	85.94	85.91
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.11	0.45	-0.23	01/01/2019 01:11 AM	85.76	85.72
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.11	0.84	-0.08	01/01/2019 01:11 AM	86.09	85.76
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.49	1.13	-0.25	01/01/2019 01:12 AM	85.72	85.61
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.70	-0.13	01/01/2019 01:15 AM	86.26	85.99
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.39	1.04	-0.05	01/01/2019 01:15 AM	85.99	85.72
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.25	0.78	-0.08	01/01/2019 01:15 AM	86.02	85.99
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.19	0.80	-0.08	01/01/2019 01:14 AM	86.05	86.02
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.12	0.95	-0.06	01/01/2019 01:11 AM	85.81	85.58
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.04	0.46	-0.08	01/01/2019 01:14 AM	85.83	85.81
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.44	-0.19	01/01/2019 01:13 AM	85.87	85.83
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.39	1.18	-0.19	01/01/2019 01:11 AM	85.58	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.19	0.96	-0.07	01/01/2019 01:13 AM	85.75	85.58
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.18	0.95	-0.09	01/01/2019 01:12 AM	85.80	85.75
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 01:14 AM	86.10	86.05
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.38	-0.20	01/01/2019 01:17 AM	86.07	85.91
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.18	0.94	-0.11	01/01/2019 01:12 AM	85.91	85.80
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.17	0.79	-0.07	01/01/2019 01:14 AM	86.10	86.05

Table C1B: USF Freeboard Results - 100-Year Chicago 3 Hour Event

US MH	DS MH	Link	USF (m)	Pipe Length (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.10	86.05	86.05	1.44
MH-1	MH-2	2-5	86.63	9.0	72.2	86.10	86.05	86.05	0.58
MH-1	MH-2	26-3	87.49	13.1	72.2	86.10	86.05	86.06	1.43
MH-1	MH-2	2-4	86.63	16.6	72.2	86.10	86.05	86.06	0.57
MH-1	MH-2	26-4	87.49	20.7	72.2	86.10	86.05	86.06	1.43
MH-1	MH-2	2-3	86.63	24.2	72.2	86.10	86.05	86.06	0.57
MH-1	MH-2	26-5	87.49	26.9	72.2	86.10	86.05	86.07	1.42
MH-1	MH-2	2-2	86.63	31.8	72.2	86.10	86.05	86.07	0.56
MH-1	MH-2	25-1	87.49	35.1	72.2	86.10	86.05	86.07	1.42
MH-1	MH-2	2-1	86.63	39.5	72.2	86.10	86.05	86.07	0.56
MH-1	MH-2	25-2	87.49	42.7	72.2	86.10	86.05	86.08	1.41
MH-1	MH-2	25-3	87.49	47.5	72.2	86.10	86.05	86.08	1.41
MH-1	MH-2	1-4	86.73	50.5	72.2	86.10	86.05	86.08	0.65
MH-1	MH-2	25-4	87.49	55.1	72.2	86.10	86.05	86.09	1.40
MH-1	MH-2	1-3	86.73	58.1	72.2	86.10	86.05	86.09	0.64
MH-1	MH-2	25-5	87.49	61.3	72.2	86.10	86.05	86.09	1.40
MH-1	MH-2	1-2	86.73	65.7	72.2	86.10	86.05	86.09	0.64
MH-1	MH-2	1-1	86.73	69.7	72.2	86.10	86.05	86.10	0.63
MH-10	MH-12	10-1	86.5	2.3	46.4	85.91	85.80	85.80	0.70
MH-10	MH-12	9-3	86.37	13.2	46.4	85.91	85.80	85.83	0.54
MH-10	MH-12	9-2	86.37	20.9	46.4	85.91	85.80	85.85	0.52
MH-10	MH-12	9-1	86.37	28.5	46.4	85.91	85.80	85.87	0.50
MH-10	MH-12	8-3	86.42	39.5	46.4	85.91	85.80	85.90	0.52
MH-10	MH-12	8-2	86.42	44.4	46.4	85.91	85.80	85.91	0.51
MH-11	MH-10	17-1	86.48	13.0	86.5	86.07	85.91	85.94	0.54
MH-11	MH-10	19-5	86.53	14.1	86.5	86.07	85.91	85.94	0.59
MH-11	MH-10	17-2	86.48	20.6	86.5	86.07	85.91	85.95	0.53
MH-11	MH-10	19-4	86.53	21.7	86.5	86.07	85.91	85.95	0.58
MH-11	MH-10	17-3	86.48	28.2	86.5	86.07	85.91	85.96	0.52
MH-11	MH-10	19-3	86.53	29.3	86.5	86.07	85.91	85.97	0.56
MH-11	MH-10	19-2	86.53	36.9	86.5	86.07	85.91	85.98	0.55
MH-11	MH-10	18-1	86.57	39.2	86.5	86.07	85.91	85.98	0.59
MH-11	MH-10	19-1	86.53	44.5	86.5	86.07	85.91	85.99	0.54
MH-11	MH-10	18-2	86.57	46.8	86.5	86.07	85.91	86.00	0.57
MH-11	MH-10	18-3	86.57	54.4	86.5	86.07	85.91	86.01	0.56
MH-11	MH-10	20-5	86.66	55.5	86.5	86.07	85.91	86.01	0.65
MH-11	MH-10	20-4	86.66	63.1	86.5	86.07	85.91	86.03	0.63
MH-11	MH-10	20-3	86.66	70.8	86.5	86.07	85.91	86.04	0.62
MH-11	MH-10	20-2	86.66	78.4	86.5	86.07	85.91	86.06	0.60
MH-11	MH-10	20-1	86.66	83.6	86.5	86.07	85.91	86.07	0.59
MH-12	MH-13	11-2	86.5	1.2	11.1	85.80	85.75	85.75	0.75
MH-12	MH-13	11-1	86.5	2.5	11.1	85.80	85.75	85.76	0.74
MH-12	MH-13	10-3	86.5	7.1	11.1	85.80	85.75	85.78	0.72
MH-12	MH-13	10-2	86.5	9.4	11.1	85.80	85.75	85.79	0.71
MH-13	MH-14	16-2	86.34	6.4	21.4	85.75	85.58	85.63	0.71
MH-13	MH-14	16-3	86.34	14.0	21.4	85.75	85.58	85.69	0.65
MH-13	MH-14	11-3	86.5	18.6	21.4	85.75	85.58	85.73	0.77
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.83	85.84	0.70
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.83	85.85	0.69
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.83	85.86	0.68
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.83	85.87	0.67
MH-16	MH-17	13-3	86.27	1.2	10.2	85.83	85.81	85.82	0.45
MH-17	MH-14	16-1	86.34	2.3	52.5	85.81	85.58	85.59	0.75
MH-17	MH-14	15-3	86.37	12.2	52.5	85.81	85.58	85.64	0.73
MH-17	MH-14	12-1	86.27	16.0	52.5	85.81	85.58	85.65	0.62
MH-17	MH-14	15-2	86.37	19.8	52.5	85.81	85.58	85.67	0.70
MH-17	MH-14	12-2	86.27	23.6	52.5	85.81	85.58	85.69	0.58
MH-17	MH-14	15-1	86.37	27.4	52.5	85.81	85.58	85.70	0.67
MH-17	MH-14	12-3	86.27	31.2	52.5	85.81	85.58	85.72	0.55
MH-17	MH-14	13-1	86.27	42.2	52.5	85.81	85.58	85.77	0.50
MH-17	MH-14	13-2	86.27	49.8	52.5	85.81	85.58	85.80	0.47
MH-2	MH-3	3-3	86.52	1.5	13.0	86.05	86.02	86.02	0.50
MH-2	MH-3	3-2	86.52	5.5	13.0	86.05	86.02	86.03	0.49
MH-2	MH-3	26-1	87.49	9.6	13.0	86.05	86.02	86.04	1.45
MH-2	MH-3	3-1	86.52	11.8	13.0	86.05	86.02	86.04	0.48
MH-3	MH-4	5-1	86.44	2.0	33.0	86.02	85.99	85.99	0.45
MH-3	MH-4	4-3	86.49	13.0	33.0	86.02	85.99	86.00	0.49
MH-3	MH-4	4-2	86.49	20.6	33.0	86.02	85.99	86.01	0.48
MH-3	MH-4	4-1	86.49	28.2	33.0	86.02	85.99	86.02	0.47
MH-4	MH-6	5-4	86.44	10.6	31.5	85.99	85.72	85.81	0.63
MH-4	MH-6	5-3	86.44	18.2	31.5	85.99	85.72	85.88	0.56
MH-4	MH-6	5-2	86.44	24.5	31.5	85.99	85.72	85.93	0.51
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.99	86.03	1.48
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.99	86.03	1.46
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.99	86.05	1.46
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.99	86.06	1.43
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.99	86.07	1.44
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.99	86.07	1.42
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.99	86.09	1.42

Table C1B: USF Freeboard Results - 100-Year Chicago 3 Hour Event

US MH	DS MH	Link	USF (m)	Pipe Invert US MH (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Interpolated HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.99	86.10	1.39
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.99	86.11	1.40
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.99	86.12	1.37
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.99	86.13	1.38
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.99	86.14	1.35
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.99	86.16	1.35
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.99	86.17	1.32
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.99	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.99	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.99	86.20	1.31
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.99	86.21	1.28
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.99	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.99	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.99	86.24	0.89
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.99	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.09	85.76	85.81	0.74
MH-7	MH-8	23-12	87.51	12.0	88.3	86.09	85.76	85.81	1.70
MH-7	MH-8	23-11	87.51	18.2	88.3	86.09	85.76	85.83	1.68
MH-7	MH-8	22-2	86.55	19.1	88.3	86.09	85.76	85.83	0.72
MH-7	MH-8	23-10	87.51	25.8	88.3	86.09	85.76	85.86	1.65
MH-7	MH-8	22-3	86.55	26.7	88.3	86.09	85.76	85.86	0.69
MH-7	MH-8	23-9	87.51	30.6	88.3	86.09	85.76	85.88	1.63
MH-7	MH-8	22-4	86.55	34.3	88.3	86.09	85.76	85.89	0.66
MH-7	MH-8	23-8	87.51	38.2	88.3	86.09	85.76	85.90	1.61
MH-7	MH-8	22-5	86.55	41.9	88.3	86.09	85.76	85.92	0.63
MH-7	MH-8	23-7	87.51	44.4	88.3	86.09	85.76	85.93	1.58
MH-7	MH-8	24-12	87.51	52.6	88.3	86.09	85.76	85.96	1.55
MH-7	MH-8	21-1	86.55	52.9	88.3	86.09	85.76	85.96	0.59
MH-7	MH-8	24-11	87.51	60.2	88.3	86.09	85.76	85.99	1.52
MH-7	MH-8	21-2	86.55	60.6	88.3	86.09	85.76	85.99	0.56
MH-7	MH-8	24-10	87.51	65.0	88.3	86.09	85.76	86.00	1.51
MH-7	MH-8	21-3	86.55	68.2	88.3	86.09	85.76	86.02	0.53
MH-7	MH-8	24-9	87.51	72.6	88.3	86.09	85.76	86.03	1.48
MH-7	MH-8	21-4	86.55	75.8	88.3	86.09	85.76	86.04	0.51
MH-7	MH-8	24-8	87.13	77.4	88.3	86.09	85.76	86.05	1.08
MH-7	MH-8	21-5	86.55	83.4	88.3	86.09	85.76	86.07	0.48
MH-7	MH-8	24-7	87.13	85.0	88.3	86.09	85.76	86.08	1.05
MH-8	MH-6	6-1	86.6	11.2	12.7	85.76	85.72	85.76	0.84
MH-9	MH-10	8-1	86.42	8.4	56.0	85.94	85.91	85.92	0.50
MH-9	MH-10	7-3	86.49	19.4	56.0	85.94	85.91	85.92	0.57
MH-9	MH-10	7-2	86.49	27.0	56.0	85.94	85.91	85.92	0.57
MH-9	MH-10	7-1	86.49	34.6	56.0	85.94	85.91	85.93	0.56
MH-9	MH-10	6-3	86.6	45.6	56.0	85.94	85.91	85.93	0.67
MH-9	MH-10	6-2	86.6	53.3	56.0	85.94	85.91	85.94	0.66
								Min	0.45
								Max	1.70
								Average	0.88

Table C2A: Pipe Data and Hydraulic Simulation Results - 100-Year SCS 24 Hour Event

U/S Node	D/S Node	U/S Invert (ft)	D/S Invert (ft)	U/S Max Cover Elevation (ft)	D/S Max Cover Elevation (ft)	Pipe Size (mm)	Pipe Length (ft)	Pipe Height (ft)	n	Design Velocity (m/s)	Design Flow (m³/s)	Peak Pipe Flow (m³/s)	Peak Flow/ Design Flow	Surcharge (ft)	Time to Peak (hh:mm)	Peak U/S HGL (ft)	Peak D/S HGL (ft)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.35	-0.24	01/01/2019 12:05 PM	85.92	85.89
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.09	0.39	-0.25	01/01/2019 12:00 PM	85.74	85.71
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.09	0.73	-0.12	01/01/2019 12:00 PM	86.05	85.74
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.47	1.08	-0.26	01/01/2019 12:01 PM	85.71	85.60
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.69	-0.13	01/01/2019 12:05 PM	86.26	85.98
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.38	1.00	-0.05	01/01/2019 12:03 PM	85.98	85.71
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.25	0.75	-0.11	01/01/2019 12:03 PM	86.00	85.98
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.18	0.76	-0.10	01/01/2019 12:03 PM	86.03	86.00
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.11	0.83	-0.09	01/01/2019 12:00 PM	85.78	85.57
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.04	0.46	-0.11	01/01/2019 12:05 PM	85.79	85.78
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.44	-0.19	01/01/2019 12:06 PM	85.87	85.79
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.35	1.07	-0.19	01/01/2019 12:00 PM	85.57	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.18	0.91	-0.09	01/01/2019 12:01 PM	85.73	85.57
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.17	0.89	-0.12	01/01/2019 12:01 PM	85.78	85.73
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 12:03 PM	86.09	86.03
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.37	-0.22	01/01/2019 12:06 PM	86.06	85.89
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.17	0.89	-0.13	01/01/2019 12:01 PM	85.89	85.78
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.16	0.74	-0.09	01/01/2019 12:02 PM	86.08	86.03

Table C2B: USF Freeboard Results - 100-Year SCS 24 Hour Event

US MH	DS MH	Node	USF (m)	Pipe Length (m)	Pipe Slope (%)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.09	86.03	86.03	1.46
MH-1	MH-2	2-5	86.63	9.0	72.2	86.09	86.03	86.03	0.60
MH-1	MH-2	26-3	87.49	13.1	72.2	86.09	86.03	86.04	1.45
MH-1	MH-2	2-4	86.63	16.6	72.2	86.09	86.03	86.04	0.59
MH-1	MH-2	26-4	87.49	20.7	72.2	86.09	86.03	86.04	1.45
MH-1	MH-2	2-3	86.63	24.2	72.2	86.09	86.03	86.05	0.58
MH-1	MH-2	26-5	87.49	26.9	72.2	86.09	86.03	86.05	1.44
MH-1	MH-2	2-2	86.63	31.8	72.2	86.09	86.03	86.05	0.58
MH-1	MH-2	25-1	87.49	35.1	72.2	86.09	86.03	86.06	1.43
MH-1	MH-2	2-1	86.63	39.5	72.2	86.09	86.03	86.06	0.57
MH-1	MH-2	25-2	87.49	42.7	72.2	86.09	86.03	86.06	1.43
MH-1	MH-2	25-3	87.49	47.5	72.2	86.09	86.03	86.07	1.42
MH-1	MH-2	1-4	86.73	50.5	72.2	86.09	86.03	86.07	0.66
MH-1	MH-2	25-4	87.49	55.1	72.2	86.09	86.03	86.07	1.42
MH-1	MH-2	1-3	86.73	58.1	72.2	86.09	86.03	86.08	0.65
MH-1	MH-2	25-5	87.49	61.3	72.2	86.09	86.03	86.08	1.41
MH-1	MH-2	1-2	86.73	65.7	72.2	86.09	86.03	86.08	0.65
MH-1	MH-2	1-1	86.73	69.7	72.2	86.09	86.03	86.09	0.64
MH-10	MH-12	10-1	86.5	2.3	46.4	85.89	85.78	85.78	0.72
MH-10	MH-12	9-3	86.37	13.2	46.4	85.89	85.78	85.81	0.56
MH-10	MH-12	9-2	86.37	20.9	46.4	85.89	85.78	85.83	0.54
MH-10	MH-12	9-1	86.37	28.5	46.4	85.89	85.78	85.85	0.52
MH-10	MH-12	8-3	86.42	39.5	46.4	85.89	85.78	85.88	0.54
MH-10	MH-12	8-2	86.42	44.4	46.4	85.89	85.78	85.89	0.53
MH-11	MH-10	17-1	86.48	13.0	86.5	86.06	85.89	85.92	0.56
MH-11	MH-10	19-5	86.53	14.1	86.5	86.06	85.89	85.92	0.61
MH-11	MH-10	17-2	86.48	20.6	86.5	86.06	85.89	85.93	0.55
MH-11	MH-10	19-4	86.53	21.7	86.5	86.06	85.89	85.93	0.60
MH-11	MH-10	17-3	86.48	28.2	86.5	86.06	85.89	85.95	0.53
MH-11	MH-10	19-3	86.53	29.3	86.5	86.06	85.89	85.95	0.58
MH-11	MH-10	19-2	86.53	36.9	86.5	86.06	85.89	85.96	0.57
MH-11	MH-10	18-1	86.57	39.2	86.5	86.06	85.89	85.97	0.60
MH-11	MH-10	19-1	86.53	44.5	86.5	86.06	85.89	85.98	0.55
MH-11	MH-10	18-2	86.57	46.8	86.5	86.06	85.89	85.98	0.59
MH-11	MH-10	18-3	86.57	54.4	86.5	86.06	85.89	86.00	0.57
MH-11	MH-10	20-5	86.66	55.5	86.5	86.06	85.89	86.00	0.66
MH-11	MH-10	20-4	86.66	63.1	86.5	86.06	85.89	86.02	0.64
MH-11	MH-10	20-3	86.66	70.8	86.5	86.06	85.89	86.03	0.63
MH-11	MH-10	20-2	86.66	78.4	86.5	86.06	85.89	86.05	0.61
MH-11	MH-10	20-1	86.66	83.6	86.5	86.06	85.89	86.06	0.60
MH-12	MH-13	11-2	86.5	1.2	11.1	85.78	85.73	85.73	0.77
MH-12	MH-13	11-1	86.5	2.5	11.1	85.78	85.73	85.74	0.76
MH-12	MH-13	10-3	86.5	7.1	11.1	85.78	85.73	85.76	0.74
MH-12	MH-13	10-2	86.5	9.4	11.1	85.78	85.73	85.77	0.73
MH-13	MH-14	16-2	86.34	6.4	21.4	85.73	85.57	85.62	0.72
MH-13	MH-14	16-3	86.34	14.0	21.4	85.73	85.57	85.67	0.67
MH-13	MH-14	11-3	86.5	18.6	21.4	85.73	85.57	85.71	0.79
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.79	85.81	0.73
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.79	85.83	0.71
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.79	85.85	0.69
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.79	85.87	0.67
MH-16	MH-17	13-3	86.27	1.2	10.2	85.79	85.78	85.78	0.49
MH-17	MH-14	16-1	86.34	2.3	52.5	85.78	85.57	85.58	0.76
MH-17	MH-14	15-3	86.37	12.2	52.5	85.78	85.57	85.62	0.75
MH-17	MH-14	12-1	86.27	16.0	52.5	85.78	85.57	85.64	0.63
MH-17	MH-14	15-2	86.37	19.8	52.5	85.78	85.57	85.65	0.72
MH-17	MH-14	12-2	86.27	23.6	52.5	85.78	85.57	85.67	0.60
MH-17	MH-14	15-1	86.37	27.4	52.5	85.78	85.57	85.68	0.69
MH-17	MH-14	12-3	86.27	31.2	52.5	85.78	85.57	85.70	0.57
MH-17	MH-14	13-1	86.27	42.2	52.5	85.78	85.57	85.74	0.53
MH-17	MH-14	13-2	86.27	49.8	52.5	85.78	85.57	85.77	0.50
MH-2	MH-3	3-3	86.52	1.5	13.0	86.03	86.00	86.00	0.52
MH-2	MH-3	3-2	86.52	5.5	13.0	86.03	86.00	86.01	0.51
MH-2	MH-3	26-1	87.49	9.6	13.0	86.03	86.00	86.02	1.47
MH-2	MH-3	3-1	86.52	11.8	13.0	86.03	86.00	86.02	0.50
MH-3	MH-4	5-1	86.44	2.0	33.0	86.00	85.98	85.98	0.46
MH-3	MH-4	4-3	86.49	13.0	33.0	86.00	85.98	85.99	0.50
MH-3	MH-4	4-2	86.49	20.6	33.0	86.00	85.98	85.99	0.50
MH-3	MH-4	4-1	86.49	28.2	33.0	86.00	85.98	86.00	0.49
MH-4	MH-6	5-4	86.44	10.6	31.5	85.98	85.71	85.80	0.64
MH-4	MH-6	5-3	86.44	18.2	31.5	85.98	85.71	85.87	0.57
MH-4	MH-6	5-2	86.44	24.5	31.5	85.98	85.71	85.92	0.52
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.98	86.02	1.49
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.98	86.03	1.46
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.98	86.04	1.47
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.98	86.05	1.44
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.98	86.06	1.45
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.98	86.07	1.42
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.98	86.08	1.43

Table C2B: USF Freeboard Results - 100-Year SCS 24 Hour Event

US MH	DS MH	Link	USF (m)	Pipe Invert US MH (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.98	86.09	1.40
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.98	86.10	1.41
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.98	86.11	1.38
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.98	86.13	1.38
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.98	86.14	1.35
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.98	86.15	1.36
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.98	86.17	1.32
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.98	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.98	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.98	86.19	1.32
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.98	86.21	1.28
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.98	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.98	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.98	86.24	0.89
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.98	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.05	85.74	85.78	0.77
MH-7	MH-8	23-12	87.51	12.0	88.3	86.05	85.74	85.78	1.73
MH-7	MH-8	23-11	87.51	18.2	88.3	86.05	85.74	85.81	1.70
MH-7	MH-8	22-2	86.55	19.1	88.3	86.05	85.74	85.81	0.74
MH-7	MH-8	23-10	87.51	25.8	88.3	86.05	85.74	85.83	1.68
MH-7	MH-8	22-3	86.55	26.7	88.3	86.05	85.74	85.84	0.71
MH-7	MH-8	23-9	87.51	30.6	88.3	86.05	85.74	85.85	1.66
MH-7	MH-8	22-4	86.55	34.3	88.3	86.05	85.74	85.86	0.69
MH-7	MH-8	23-8	87.51	38.2	88.3	86.05	85.74	85.88	1.63
MH-7	MH-8	22-5	86.55	41.9	88.3	86.05	85.74	85.89	0.66
MH-7	MH-8	23-7	87.51	44.4	88.3	86.05	85.74	85.90	1.61
MH-7	MH-8	24-12	87.51	52.6	88.3	86.05	85.74	85.93	1.58
MH-7	MH-8	21-1	86.55	52.9	88.3	86.05	85.74	85.93	0.62
MH-7	MH-8	24-11	87.51	60.2	88.3	86.05	85.74	85.95	1.56
MH-7	MH-8	21-2	86.55	60.6	88.3	86.05	85.74	85.95	0.60
MH-7	MH-8	24-10	87.51	65.0	88.3	86.05	85.74	85.97	1.54
MH-7	MH-8	21-3	86.55	68.2	88.3	86.05	85.74	85.98	0.57
MH-7	MH-8	24-9	87.51	72.6	88.3	86.05	85.74	86.00	1.51
MH-7	MH-8	21-4	86.55	75.8	88.3	86.05	85.74	86.01	0.54
MH-7	MH-8	24-8	87.13	77.4	88.3	86.05	85.74	86.01	1.12
MH-7	MH-8	21-5	86.55	83.4	88.3	86.05	85.74	86.03	0.52
MH-7	MH-8	24-7	87.13	85.0	88.3	86.05	85.74	86.04	1.09
MH-8	MH-6	6-1	86.6	11.2	12.7	85.74	85.71	85.74	0.86
MH-9	MH-10	8-1	86.42	8.4	56.0	85.92	85.89	85.90	0.52
MH-9	MH-10	7-3	86.49	19.4	56.0	85.92	85.89	85.90	0.59
MH-9	MH-10	7-2	86.49	27.0	56.0	85.92	85.89	85.90	0.59
MH-9	MH-10	7-1	86.49	34.6	56.0	85.92	85.89	85.91	0.58
MH-9	MH-10	6-3	86.6	45.6	56.0	85.92	85.89	85.91	0.69
MH-9	MH-10	6-2	86.6	53.3	56.0	85.92	85.89	85.92	0.68
								Min	0.46
								Max	1.73
								Average	0.90

Table C3A: Pipe Data and Hydraulic Simulation Results - 1979 Event

U/S Mh	D/S Mh	U/S Invert (m)	D/S Invert (m)	U/S Rim/ Cover Elevation (m)	D/S Rim/ Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n	Design Velocity (m/s)	Design Flow (m3/s)	Peak Pipe Flow (m/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time to Peak Surcharge	Max. U/S Hgl (m)	Max. D/S Hgl (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.34	-0.25	01/01/2019 01:38 AM	85.91	85.88
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.08	0.35	-0.27	01/01/2019 01:31 AM	85.72	85.70
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.08	0.66	-0.14	01/01/2019 01:31 AM	86.03	85.72
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.45	1.03	-0.27	01/01/2019 01:32 AM	85.70	85.59
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.69	-0.13	01/01/2019 01:42 AM	86.26	85.96
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.36	0.97	-0.08	01/01/2019 01:33 AM	85.96	85.70
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.24	0.73	-0.13	01/01/2019 01:35 AM	85.98	85.96
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.18	0.73	-0.11	01/01/2019 01:35 AM	86.02	85.98
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.09	0.73	-0.13	01/01/2019 01:31 AM	85.74	85.57
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.04	0.44	-0.14	01/01/2019 01:35 AM	85.76	85.74
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.44	-0.19	01/01/2019 01:42 AM	85.87	85.76
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.32	0.96	-0.19	01/01/2019 01:31 AM	85.57	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.17	0.87	-0.09	01/01/2019 01:32 AM	85.72	85.57
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.16	0.86	-0.13	01/01/2019 01:32 AM	85.77	85.72
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 01:41 AM	86.09	86.02
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.37	-0.22	01/01/2019 01:43 AM	86.06	85.88
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.16	0.85	-0.14	01/01/2019 01:32 AM	85.88	85.77
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.15	0.71	-0.11	01/01/2019 01:33 AM	86.06	86.02

Table C3B: USF Freeboard Results - 1979 Event

US MH	DS MH	Reach	USF (m)	Distance to MH (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.09	86.02	86.03	1.46
MH-1	MH-2	2-5	86.63	9.0	72.2	86.09	86.02	86.03	0.60
MH-1	MH-2	26-3	87.49	13.1	72.2	86.09	86.02	86.03	1.46
MH-1	MH-2	2-4	86.63	16.6	72.2	86.09	86.02	86.03	0.60
MH-1	MH-2	26-4	87.49	20.7	72.2	86.09	86.02	86.04	1.45
MH-1	MH-2	2-3	86.63	24.2	72.2	86.09	86.02	86.04	0.59
MH-1	MH-2	26-5	87.49	26.9	72.2	86.09	86.02	86.04	1.45
MH-1	MH-2	2-2	86.63	31.8	72.2	86.09	86.02	86.05	0.58
MH-1	MH-2	25-1	87.49	35.1	72.2	86.09	86.02	86.05	1.44
MH-1	MH-2	2-1	86.63	39.5	72.2	86.09	86.02	86.06	0.57
MH-1	MH-2	25-2	87.49	42.7	72.2	86.09	86.02	86.06	1.43
MH-1	MH-2	25-3	87.49	47.5	72.2	86.09	86.02	86.06	1.43
MH-1	MH-2	1-4	86.73	50.5	72.2	86.09	86.02	86.07	0.66
MH-1	MH-2	25-4	87.49	55.1	72.2	86.09	86.02	86.07	1.42
MH-1	MH-2	1-3	86.73	58.1	72.2	86.09	86.02	86.07	0.66
MH-1	MH-2	25-5	87.49	61.3	72.2	86.09	86.02	86.08	1.41
MH-1	MH-2	1-2	86.73	65.7	72.2	86.09	86.02	86.08	0.65
MH-1	MH-2	1-1	86.73	69.7	72.2	86.09	86.02	86.09	0.64
MH-10	MH-12	10-1	86.5	2.3	46.4	85.88	85.77	85.77	0.73
MH-10	MH-12	9-3	86.37	13.2	46.4	85.88	85.77	85.80	0.57
MH-10	MH-12	9-2	86.37	20.9	46.4	85.88	85.77	85.82	0.55
MH-10	MH-12	9-1	86.37	28.5	46.4	85.88	85.77	85.84	0.53
MH-10	MH-12	8-3	86.42	39.5	46.4	85.88	85.77	85.87	0.55
MH-10	MH-12	8-2	86.42	44.4	46.4	85.88	85.77	85.88	0.54
MH-11	MH-10	17-1	86.48	13.0	86.5	86.06	85.88	85.91	0.57
MH-11	MH-10	19-5	86.53	14.1	86.5	86.06	85.88	85.91	0.62
MH-11	MH-10	17-2	86.48	20.6	86.5	86.06	85.88	85.92	0.56
MH-11	MH-10	19-4	86.53	21.7	86.5	86.06	85.88	85.93	0.60
MH-11	MH-10	17-3	86.48	28.2	86.5	86.06	85.88	85.94	0.54
MH-11	MH-10	19-3	86.53	29.3	86.5	86.06	85.88	85.94	0.59
MH-11	MH-10	19-2	86.53	36.9	86.5	86.06	85.88	85.96	0.57
MH-11	MH-10	18-1	86.57	39.2	86.5	86.06	85.88	85.96	0.61
MH-11	MH-10	19-1	86.53	44.5	86.5	86.06	85.88	85.97	0.56
MH-11	MH-10	18-2	86.57	46.8	86.5	86.06	85.88	85.98	0.59
MH-11	MH-10	18-3	86.57	54.4	86.5	86.06	85.88	86.00	0.57
MH-11	MH-10	20-5	86.66	55.5	86.5	86.06	85.88	86.00	0.66
MH-11	MH-10	20-4	86.66	63.1	86.5	86.06	85.88	86.01	0.65
MH-11	MH-10	20-3	86.66	70.8	86.5	86.06	85.88	86.03	0.63
MH-11	MH-10	20-2	86.66	78.4	86.5	86.06	85.88	86.05	0.61
MH-11	MH-10	20-1	86.66	83.6	86.5	86.06	85.88	86.06	0.60
MH-12	MH-13	11-2	86.5	1.2	11.1	85.77	85.72	85.72	0.78
MH-12	MH-13	11-1	86.5	2.5	11.1	85.77	85.72	85.73	0.77
MH-12	MH-13	10-3	86.5	7.1	11.1	85.77	85.72	85.75	0.75
MH-12	MH-13	10-2	86.5	9.4	11.1	85.77	85.72	85.76	0.74
MH-13	MH-14	16-2	86.34	6.4	21.4	85.72	85.57	85.62	0.72
MH-13	MH-14	16-3	86.34	14.0	21.4	85.72	85.57	85.67	0.67
MH-13	MH-14	11-3	86.5	18.6	21.4	85.72	85.57	85.70	0.80
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.76	85.79	0.75
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.76	85.81	0.73
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.76	85.84	0.70
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.76	85.86	0.68
MH-16	MH-17	13-3	86.27	1.2	10.2	85.76	85.74	85.75	0.52
MH-17	MH-14	16-1	86.34	2.3	52.5	85.74	85.57	85.58	0.76
MH-17	MH-14	15-3	86.37	12.2	52.5	85.74	85.57	85.61	0.76
MH-17	MH-14	12-1	86.27	16.0	52.5	85.74	85.57	85.63	0.64
MH-17	MH-14	15-2	86.37	19.8	52.5	85.74	85.57	85.64	0.73
MH-17	MH-14	12-2	86.27	23.6	52.5	85.74	85.57	85.65	0.62
MH-17	MH-14	15-1	86.37	27.4	52.5	85.74	85.57	85.66	0.71
MH-17	MH-14	12-3	86.27	31.2	52.5	85.74	85.57	85.67	0.60
MH-17	MH-14	13-1	86.27	42.2	52.5	85.74	85.57	85.71	0.56
MH-17	MH-14	13-2	86.27	49.8	52.5	85.74	85.57	85.74	0.53
MH-2	MH-3	3-3	86.52	1.5	13.0	86.02	85.98	85.99	0.53
MH-2	MH-3	3-2	86.52	5.5	13.0	86.02	85.98	86.00	0.52
MH-2	MH-3	26-1	87.49	9.6	13.0	86.02	85.98	86.01	1.48
MH-2	MH-3	3-1	86.52	11.8	13.0	86.02	85.98	86.01	0.51
MH-3	MH-4	5-1	86.44	2.0	33.0	85.98	85.96	85.96	0.48
MH-3	MH-4	4-3	86.49	13.0	33.0	85.98	85.96	85.97	0.52
MH-3	MH-4	4-2	86.49	20.6	33.0	85.98	85.96	85.97	0.52
MH-3	MH-4	4-1	86.49	28.2	33.0	85.98	85.96	85.98	0.51
MH-4	MH-6	5-4	86.44	10.6	31.5	85.96	85.70	85.79	0.65
MH-4	MH-6	5-3	86.44	18.2	31.5	85.96	85.70	85.85	0.59
MH-4	MH-6	5-2	86.44	24.5	31.5	85.96	85.70	85.90	0.54
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.96	86.00	1.51
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.96	86.01	1.48
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.96	86.02	1.49
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.96	86.04	1.45
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.96	86.05	1.46
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.96	86.05	1.44
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.96	86.07	1.44

Table C3B: USF Freeboard Results - 1979 Event

US MH	DS MH	Reach	USF (m)	Flat Roof to MH (m)	Flat Length (m)	US MH Rim (m)	DS MH Rim (m)	Interpolated Rim (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.96	86.08	1.41
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.96	86.09	1.42
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.96	86.10	1.39
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.96	86.12	1.39
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.96	86.13	1.36
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.96	86.14	1.37
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.96	86.16	1.33
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.96	86.17	1.34
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.96	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.96	86.19	1.32
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.96	86.20	1.29
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.96	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.96	86.22	1.27
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.96	86.23	0.90
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.96	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.03	85.72	85.76	0.79
MH-7	MH-8	23-12	87.51	12.0	88.3	86.03	85.72	85.76	1.75
MH-7	MH-8	23-11	87.51	18.2	88.3	86.03	85.72	85.79	1.72
MH-7	MH-8	22-2	86.55	19.1	88.3	86.03	85.72	85.79	0.76
MH-7	MH-8	23-10	87.51	25.8	88.3	86.03	85.72	85.81	1.70
MH-7	MH-8	22-3	86.55	26.7	88.3	86.03	85.72	85.82	0.73
MH-7	MH-8	23-9	87.51	30.6	88.3	86.03	85.72	85.83	1.68
MH-7	MH-8	22-4	86.55	34.3	88.3	86.03	85.72	85.84	0.71
MH-7	MH-8	23-8	87.51	38.2	88.3	86.03	85.72	85.86	1.65
MH-7	MH-8	22-5	86.55	41.9	88.3	86.03	85.72	85.87	0.68
MH-7	MH-8	23-7	87.51	44.4	88.3	86.03	85.72	85.88	1.63
MH-7	MH-8	24-12	87.51	52.6	88.3	86.03	85.72	85.91	1.60
MH-7	MH-8	21-1	86.55	52.9	88.3	86.03	85.72	85.91	0.64
MH-7	MH-8	24-11	87.51	60.2	88.3	86.03	85.72	85.93	1.58
MH-7	MH-8	21-2	86.55	60.6	88.3	86.03	85.72	85.93	0.62
MH-7	MH-8	24-10	87.51	65.0	88.3	86.03	85.72	85.95	1.56
MH-7	MH-8	21-3	86.55	68.2	88.3	86.03	85.72	85.96	0.59
MH-7	MH-8	24-9	87.51	72.6	88.3	86.03	85.72	85.98	1.53
MH-7	MH-8	21-4	86.55	75.8	88.3	86.03	85.72	85.99	0.56
MH-7	MH-8	24-8	87.13	77.4	88.3	86.03	85.72	85.99	1.14
MH-7	MH-8	21-5	86.55	83.4	88.3	86.03	85.72	86.01	0.54
MH-7	MH-8	24-7	87.13	85.0	88.3	86.03	85.72	86.02	1.11
MH-8	MH-6	6-1	86.6	11.2	12.7	85.72	85.70	85.72	0.88
MH-9	MH-10	8-1	86.42	8.4	56.0	85.91	85.88	85.89	0.53
MH-9	MH-10	7-3	86.49	19.4	56.0	85.91	85.88	85.89	0.60
MH-9	MH-10	7-2	86.49	27.0	56.0	85.91	85.88	85.89	0.60
MH-9	MH-10	7-1	86.49	34.6	56.0	85.91	85.88	85.90	0.59
MH-9	MH-10	6-3	86.6	45.6	56.0	85.91	85.88	85.90	0.70
MH-9	MH-10	6-2	86.6	53.3	56.0	85.91	85.88	85.91	0.69
								Min	0.48
								Max	1.75
								Average	0.91

Table C4A: Pipe Data and Hydraulic Simulation Results - 1988 Event

U/S Node	D/S Node	U/S Invert (m)	D/S Invert (m)	U/S Rim/ Cover Elevation (m)	D/S Rim/ Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Rough (n)	Pipe Slope (%)	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time to Peak (hh:mm)	Peak U/S HGL (m)	Peak D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.35	-0.25	01/01/2019 02:07 AM	85.91	85.88
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.09	0.39	-0.25	01/01/2019 02:02 AM	85.74	85.70
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.09	0.72	-0.12	01/01/2019 02:02 AM	86.05	85.74
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.47	1.09	-0.27	01/01/2019 02:02 AM	85.70	85.60
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.68	-0.13	01/01/2019 02:04 AM	86.26	85.97
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.37	0.98	-0.06	01/01/2019 02:03 AM	85.97	85.70
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.24	0.73	-0.11	01/01/2019 02:05 AM	85.99	85.97
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.18	0.74	-0.11	01/01/2019 02:04 AM	86.02	85.99
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.11	0.82	-0.10	01/01/2019 02:02 AM	85.77	85.57
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.05	0.47	-0.11	01/01/2019 02:05 AM	85.79	85.77
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.44	-0.19	01/01/2019 02:05 AM	85.87	85.79
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.33	1.01	-0.19	01/01/2019 02:01 AM	85.57	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.17	0.87	-0.09	01/01/2019 02:02 AM	85.72	85.57
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.16	0.85	-0.13	01/01/2019 02:03 AM	85.77	85.72
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 02:04 AM	86.09	86.02
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.37	-0.22	01/01/2019 02:04 AM	86.06	85.88
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.16	0.85	-0.14	01/01/2019 02:03 AM	85.88	85.77
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.16	0.72	-0.09	01/01/2019 02:02 AM	86.07	86.02

Table C4B: USF Freeboard Results - 1988

From MH	To MH	Link #	USF (m)	Distance to MH (m)	Pipe Length (m)	US MH Elev (m)	DS MH Elev (m)	Intermediate Elev (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.09	86.02	86.03	1.46
MH-1	MH-2	2-5	86.63	9.0	72.2	86.09	86.02	86.03	0.60
MH-1	MH-2	26-3	87.49	13.1	72.2	86.09	86.02	86.03	1.46
MH-1	MH-2	2-4	86.63	16.6	72.2	86.09	86.02	86.03	0.60
MH-1	MH-2	26-4	87.49	20.7	72.2	86.09	86.02	86.04	1.45
MH-1	MH-2	2-3	86.63	24.2	72.2	86.09	86.02	86.04	0.59
MH-1	MH-2	26-5	87.49	26.9	72.2	86.09	86.02	86.04	1.45
MH-1	MH-2	2-2	86.63	31.8	72.2	86.09	86.02	86.05	0.58
MH-1	MH-2	25-1	87.49	35.1	72.2	86.09	86.02	86.05	1.44
MH-1	MH-2	2-1	86.63	39.5	72.2	86.09	86.02	86.06	0.57
MH-1	MH-2	25-2	87.49	42.7	72.2	86.09	86.02	86.06	1.43
MH-1	MH-2	25-3	87.49	47.5	72.2	86.09	86.02	86.06	1.43
MH-1	MH-2	1-4	86.73	50.5	72.2	86.09	86.02	86.07	0.66
MH-1	MH-2	25-4	87.49	55.1	72.2	86.09	86.02	86.07	1.42
MH-1	MH-2	1-3	86.73	58.1	72.2	86.09	86.02	86.07	0.66
MH-1	MH-2	25-5	87.49	61.3	72.2	86.09	86.02	86.08	1.41
MH-1	MH-2	1-2	86.73	65.7	72.2	86.09	86.02	86.08	0.65
MH-1	MH-2	1-1	86.73	69.7	72.2	86.09	86.02	86.09	0.64
MH-10	MH-12	10-1	86.5	2.3	46.4	85.88	85.77	85.77	0.73
MH-10	MH-12	9-3	86.37	13.2	46.4	85.88	85.77	85.80	0.57
MH-10	MH-12	9-2	86.37	20.9	46.4	85.88	85.77	85.82	0.55
MH-10	MH-12	9-1	86.37	28.5	46.4	85.88	85.77	85.84	0.53
MH-10	MH-12	8-3	86.42	39.5	46.4	85.88	85.77	85.87	0.55
MH-10	MH-12	8-2	86.42	44.4	46.4	85.88	85.77	85.88	0.54
MH-11	MH-10	17-1	86.48	13.0	86.5	86.06	85.88	85.91	0.57
MH-11	MH-10	19-5	86.53	14.1	86.5	86.06	85.88	85.91	0.62
MH-11	MH-10	17-2	86.48	20.6	86.5	86.06	85.88	85.92	0.56
MH-11	MH-10	19-4	86.53	21.7	86.5	86.06	85.88	85.93	0.60
MH-11	MH-10	17-3	86.48	28.2	86.5	86.06	85.88	85.94	0.54
MH-11	MH-10	19-3	86.53	29.3	86.5	86.06	85.88	85.94	0.59
MH-11	MH-10	19-2	86.53	36.9	86.5	86.06	85.88	85.96	0.57
MH-11	MH-10	18-1	86.57	39.2	86.5	86.06	85.88	85.96	0.61
MH-11	MH-10	19-1	86.53	44.5	86.5	86.06	85.88	85.97	0.56
MH-11	MH-10	18-2	86.57	46.8	86.5	86.06	85.88	85.98	0.59
MH-11	MH-10	18-3	86.57	54.4	86.5	86.06	85.88	86.00	0.57
MH-11	MH-10	20-5	86.66	55.5	86.5	86.06	85.88	86.00	0.66
MH-11	MH-10	20-4	86.66	63.1	86.5	86.06	85.88	86.01	0.65
MH-11	MH-10	20-3	86.66	70.8	86.5	86.06	85.88	86.03	0.63
MH-11	MH-10	20-2	86.66	78.4	86.5	86.06	85.88	86.05	0.61
MH-11	MH-10	20-1	86.66	83.6	86.5	86.06	85.88	86.06	0.60
MH-12	MH-13	11-2	86.5	1.2	11.1	85.77	85.72	85.72	0.78
MH-12	MH-13	11-1	86.5	2.5	11.1	85.77	85.72	85.73	0.77
MH-12	MH-13	10-3	86.5	7.1	11.1	85.77	85.72	85.75	0.75
MH-12	MH-13	10-2	86.5	9.4	11.1	85.77	85.72	85.76	0.74
MH-13	MH-14	16-2	86.34	6.4	21.4	85.72	85.57	85.62	0.72
MH-13	MH-14	16-3	86.34	14.0	21.4	85.72	85.57	85.67	0.67
MH-13	MH-14	11-3	86.5	18.6	21.4	85.72	85.57	85.70	0.80
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.79	85.81	0.73
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.79	85.83	0.71
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.79	85.85	0.69
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.79	85.87	0.67
MH-16	MH-17	13-3	86.27	1.2	10.2	85.79	85.77	85.78	0.49
MH-17	MH-14	16-1	86.34	2.3	52.5	85.77	85.57	85.58	0.76
MH-17	MH-14	15-3	86.37	12.2	52.5	85.77	85.57	85.62	0.75
MH-17	MH-14	12-1	86.27	16.0	52.5	85.77	85.57	85.63	0.64
MH-17	MH-14	15-2	86.37	19.8	52.5	85.77	85.57	85.65	0.72
MH-17	MH-14	12-2	86.27	23.6	52.5	85.77	85.57	85.66	0.61
MH-17	MH-14	15-1	86.37	27.4	52.5	85.77	85.57	85.68	0.69
MH-17	MH-14	12-3	86.27	31.2	52.5	85.77	85.57	85.69	0.58
MH-17	MH-14	13-1	86.27	42.2	52.5	85.77	85.57	85.73	0.54
MH-17	MH-14	13-2	86.27	49.8	52.5	85.77	85.57	85.76	0.51
MH-2	MH-3	3-3	86.52	1.5	13.0	86.02	85.99	85.99	0.53
MH-2	MH-3	3-2	86.52	5.5	13.0	86.02	85.99	86.00	0.52
MH-2	MH-3	26-1	87.49	9.6	13.0	86.02	85.99	86.01	1.48
MH-2	MH-3	3-1	86.52	11.8	13.0	86.02	85.99	86.01	0.51
MH-3	MH-4	5-1	86.44	2.0	33.0	85.99	85.97	85.97	0.47
MH-3	MH-4	4-3	86.49	13.0	33.0	85.99	85.97	85.98	0.51
MH-3	MH-4	4-2	86.49	20.6	33.0	85.99	85.97	85.98	0.51
MH-3	MH-4	4-1	86.49	28.2	33.0	85.99	85.97	85.99	0.50
MH-4	MH-6	5-4	86.44	10.6	31.5	85.97	85.70	85.79	0.65
MH-4	MH-6	5-3	86.44	18.2	31.5	85.97	85.70	85.86	0.58
MH-4	MH-6	5-2	86.44	24.5	31.5	85.97	85.70	85.91	0.53
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	85.97	86.01	1.50
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	85.97	86.02	1.47
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	85.97	86.03	1.48
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	85.97	86.04	1.45
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	85.97	86.06	1.45
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	85.97	86.06	1.43
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	85.97	86.07	1.44

Table C4B: USF Freeboard Results - 1988

US MH	DS MH	Link #	USF (m)	Pipe Invert US MH (m)	Pipe Length (m)	US MH RIM (m)	DS MH RIM (m)	Interpolated HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	85.97	86.09	1.40
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	85.97	86.10	1.41
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	85.97	86.11	1.38
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	85.97	86.12	1.39
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	85.97	86.14	1.35
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	85.97	86.15	1.36
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	85.97	86.16	1.33
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	85.97	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	85.97	86.18	1.31
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	85.97	86.19	1.32
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	85.97	86.20	1.29
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	85.97	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	85.97	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	85.97	86.23	0.90
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	85.97	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.05	85.74	85.78	0.77
MH-7	MH-8	23-12	87.51	12.0	88.3	86.05	85.74	85.78	1.73
MH-7	MH-8	23-11	87.51	18.2	88.3	86.05	85.74	85.81	1.70
MH-7	MH-8	22-2	86.55	19.1	88.3	86.05	85.74	85.81	0.74
MH-7	MH-8	23-10	87.51	25.8	88.3	86.05	85.74	85.83	1.68
MH-7	MH-8	22-3	86.55	26.7	88.3	86.05	85.74	85.84	0.71
MH-7	MH-8	23-9	87.51	30.6	88.3	86.05	85.74	85.85	1.66
MH-7	MH-8	22-4	86.55	34.3	88.3	86.05	85.74	85.86	0.69
MH-7	MH-8	23-8	87.51	38.2	88.3	86.05	85.74	85.88	1.63
MH-7	MH-8	22-5	86.55	41.9	88.3	86.05	85.74	85.89	0.66
MH-7	MH-8	23-7	87.51	44.4	88.3	86.05	85.74	85.90	1.61
MH-7	MH-8	24-12	87.51	52.6	88.3	86.05	85.74	85.93	1.58
MH-7	MH-8	21-1	86.55	52.9	88.3	86.05	85.74	85.93	0.62
MH-7	MH-8	24-11	87.51	60.2	88.3	86.05	85.74	85.95	1.56
MH-7	MH-8	21-2	86.55	60.6	88.3	86.05	85.74	85.95	0.60
MH-7	MH-8	24-10	87.51	65.0	88.3	86.05	85.74	85.97	1.54
MH-7	MH-8	21-3	86.55	68.2	88.3	86.05	85.74	85.98	0.57
MH-7	MH-8	24-9	87.51	72.6	88.3	86.05	85.74	86.00	1.51
MH-7	MH-8	21-4	86.55	75.8	88.3	86.05	85.74	86.01	0.54
MH-7	MH-8	24-8	87.13	77.4	88.3	86.05	85.74	86.01	1.12
MH-7	MH-8	21-5	86.55	83.4	88.3	86.05	85.74	86.03	0.52
MH-7	MH-8	24-7	87.13	85.0	88.3	86.05	85.74	86.04	1.09
MH-8	MH-6	6-1	86.6	11.2	12.7	85.74	85.70	85.74	0.86
MH-9	MH-10	8-1	86.42	8.4	56.0	85.91	85.88	85.89	0.53
MH-9	MH-10	7-3	86.49	19.4	56.0	85.91	85.88	85.89	0.60
MH-9	MH-10	7-2	86.49	27.0	56.0	85.91	85.88	85.89	0.60
MH-9	MH-10	7-1	86.49	34.6	56.0	85.91	85.88	85.90	0.59
MH-9	MH-10	6-3	86.6	45.6	56.0	85.91	85.88	85.90	0.70
MH-9	MH-10	6-2	86.6	53.3	56.0	85.91	85.88	85.91	0.69
								Min	0.47
								Max	1.73
								Average	0.91

Table C5A: Pipe Data and Hydraulic Simulation Results - 1996 Event

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n (-)	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To peak (hh:mm)	Max U/S HGL (m)	Max D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.34	-0.25	01/01/2019 01:34 AM	85.91	85.87
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.08	0.34	-0.27	01/01/2019 01:29 AM	85.72	85.69
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.08	0.64	-0.15	01/01/2019 01:29 AM	86.02	85.72
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.43	1.00	-0.28	01/01/2019 01:30 AM	85.69	85.58
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.67	-0.14	01/01/2019 01:33 AM	86.25	85.95
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.35	0.94	-0.08	01/01/2019 01:31 AM	85.95	85.69
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.23	0.72	-0.13	01/01/2019 01:32 AM	85.97	85.95
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.17	0.72	-0.12	01/01/2019 01:32 AM	86.01	85.97
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.09	0.69	-0.14	01/01/2019 01:28 AM	85.73	85.57
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.04	0.45	-0.16	01/01/2019 01:33 AM	85.75	85.73
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.43	-0.19	01/01/2019 01:33 AM	85.87	85.75
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.30	0.92	-0.19	01/01/2019 01:30 AM	85.57	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.17	0.86	-0.11	01/01/2019 01:31 AM	85.71	85.57
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.16	0.84	-0.14	01/01/2019 01:31 AM	85.76	85.71
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.23	-0.25	01/01/2019 01:32 AM	86.09	86.01
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.36	-0.22	01/01/2019 01:32 AM	86.06	85.87
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.16	0.84	-0.15	01/01/2019 01:31 AM	85.87	85.76
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.15	0.70	-0.12	01/01/2019 01:30 AM	86.05	86.01

Table C5B: USF Freeboard Results - 1996 Event

US MH	DS MH	Node	USF (m)	Distance to MH (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.09	86.01	86.02	1.47
MH-1	MH-2	2-5	86.63	9.0	72.2	86.09	86.01	86.02	0.61
MH-1	MH-2	26-3	87.49	13.1	72.2	86.09	86.01	86.02	1.47
MH-1	MH-2	2-4	86.63	16.6	72.2	86.09	86.01	86.03	0.60
MH-1	MH-2	26-4	87.49	20.7	72.2	86.09	86.01	86.03	1.46
MH-1	MH-2	2-3	86.63	24.2	72.2	86.09	86.01	86.03	0.60
MH-1	MH-2	26-5	87.49	26.9	72.2	86.09	86.01	86.04	1.45
MH-1	MH-2	2-2	86.63	31.8	72.2	86.09	86.01	86.04	0.59
MH-1	MH-2	25-1	87.49	35.1	72.2	86.09	86.01	86.05	1.44
MH-1	MH-2	2-1	86.63	39.5	72.2	86.09	86.01	86.05	0.58
MH-1	MH-2	25-2	87.49	42.7	72.2	86.09	86.01	86.05	1.44
MH-1	MH-2	25-3	87.49	47.5	72.2	86.09	86.01	86.06	1.43
MH-1	MH-2	1-4	86.73	50.5	72.2	86.09	86.01	86.06	0.67
MH-1	MH-2	25-4	87.49	55.1	72.2	86.09	86.01	86.07	1.42
MH-1	MH-2	1-3	86.73	58.1	72.2	86.09	86.01	86.07	0.66
MH-1	MH-2	25-5	87.49	61.3	72.2	86.09	86.01	86.08	1.41
MH-1	MH-2	1-2	86.73	65.7	72.2	86.09	86.01	86.08	0.65
MH-1	MH-2	1-1	86.73	69.7	72.2	86.09	86.01	86.09	0.64
MH-10	MH-12	10-1	86.5	2.3	46.4	85.87	85.76	85.76	0.74
MH-10	MH-12	9-3	86.37	13.2	46.4	85.87	85.76	85.79	0.58
MH-10	MH-12	9-2	86.37	20.9	46.4	85.87	85.76	85.81	0.56
MH-10	MH-12	9-1	86.37	28.5	46.4	85.87	85.76	85.83	0.54
MH-10	MH-12	8-3	86.42	39.5	46.4	85.87	85.76	85.86	0.56
MH-10	MH-12	8-2	86.42	44.4	46.4	85.87	85.76	85.87	0.55
MH-11	MH-10	17-1	86.48	13.0	86.5	86.06	85.87	85.90	0.58
MH-11	MH-10	19-5	86.53	14.1	86.5	86.06	85.87	85.90	0.63
MH-11	MH-10	17-2	86.48	20.6	86.5	86.06	85.87	85.92	0.56
MH-11	MH-10	19-4	86.53	21.7	86.5	86.06	85.87	85.92	0.61
MH-11	MH-10	17-3	86.48	28.2	86.5	86.06	85.87	85.93	0.55
MH-11	MH-10	19-3	86.53	29.3	86.5	86.06	85.87	85.94	0.59
MH-11	MH-10	19-2	86.53	36.9	86.5	86.06	85.87	85.95	0.58
MH-11	MH-10	18-1	86.57	39.2	86.5	86.06	85.87	85.96	0.61
MH-11	MH-10	19-1	86.53	44.5	86.5	86.06	85.87	85.97	0.56
MH-11	MH-10	18-2	86.57	46.8	86.5	86.06	85.87	85.97	0.60
MH-11	MH-10	18-3	86.57	54.4	86.5	86.06	85.87	85.99	0.58
MH-11	MH-10	20-5	86.66	55.5	86.5	86.06	85.87	85.99	0.67
MH-11	MH-10	20-4	86.66	63.1	86.5	86.06	85.87	86.01	0.65
MH-11	MH-10	20-3	86.66	70.8	86.5	86.06	85.87	86.03	0.63
MH-11	MH-10	20-2	86.66	78.4	86.5	86.06	85.87	86.04	0.62
MH-11	MH-10	20-1	86.66	83.6	86.5	86.06	85.87	86.06	0.60
MH-12	MH-13	11-2	86.5	1.2	11.1	85.76	85.71	85.71	0.79
MH-12	MH-13	11-1	86.5	2.5	11.1	85.76	85.71	85.72	0.78
MH-12	MH-13	10-3	86.5	7.1	11.1	85.76	85.71	85.74	0.76
MH-12	MH-13	10-2	86.5	9.4	11.1	85.76	85.71	85.75	0.75
MH-13	MH-14	16-2	86.34	6.4	21.4	85.71	85.57	85.61	0.73
MH-13	MH-14	16-3	86.34	14.0	21.4	85.71	85.57	85.66	0.68
MH-13	MH-14	11-3	86.5	18.6	21.4	85.71	85.57	85.69	0.81
MH-15	MH-16	14-4	86.54	8.9	33.6	85.87	85.75	85.78	0.76
MH-15	MH-16	14-3	86.54	16.5	33.6	85.87	85.75	85.81	0.73
MH-15	MH-16	14-2	86.54	24.2	33.6	85.87	85.75	85.84	0.70
MH-15	MH-16	14-1	86.54	31.8	33.6	85.87	85.75	85.86	0.68
MH-16	MH-17	13-3	86.27	1.2	10.2	85.75	85.73	85.74	0.53
MH-17	MH-14	16-1	86.34	2.3	52.5	85.73	85.57	85.58	0.76
MH-17	MH-14	15-3	86.37	12.2	52.5	85.73	85.57	85.61	0.76
MH-17	MH-14	12-1	86.27	16.0	52.5	85.73	85.57	85.62	0.65
MH-17	MH-14	15-2	86.37	19.8	52.5	85.73	85.57	85.63	0.74
MH-17	MH-14	12-2	86.27	23.6	52.5	85.73	85.57	85.65	0.62
MH-17	MH-14	15-1	86.37	27.4	52.5	85.73	85.57	85.66	0.71
MH-17	MH-14	12-3	86.27	31.2	52.5	85.73	85.57	85.67	0.60
MH-17	MH-14	13-1	86.27	42.2	52.5	85.73	85.57	85.70	0.57
MH-17	MH-14	13-2	86.27	49.8	52.5	85.73	85.57	85.73	0.54
MH-2	MH-3	3-3	86.52	1.5	13.0	86.01	85.97	85.98	0.54
MH-2	MH-3	3-2	86.52	5.5	13.0	86.01	85.97	85.99	0.53
MH-2	MH-3	26-1	87.49	9.6	13.0	86.01	85.97	86.00	1.49
MH-2	MH-3	3-1	86.52	11.8	13.0	86.01	85.97	86.00	0.52
MH-3	MH-4	5-1	86.44	2.0	33.0	85.97	85.95	85.95	0.49
MH-3	MH-4	4-3	86.49	13.0	33.0	85.97	85.95	85.96	0.53
MH-3	MH-4	4-2	86.49	20.6	33.0	85.97	85.95	85.96	0.53
MH-3	MH-4	4-1	86.49	28.2	33.0	85.97	85.95	85.97	0.52
MH-4	MH-6	5-4	86.44	10.6	31.5	85.95	85.69	85.78	0.66
MH-4	MH-6	5-3	86.44	18.2	31.5	85.95	85.69	85.84	0.60
MH-4	MH-6	5-2	86.44	24.5	31.5	85.95	85.69	85.89	0.55
MH-5	MH-4	23-1	87.51	10.8	84.0	86.25	85.95	85.99	1.52
MH-5	MH-4	26-10	87.49	13.1	84.0	86.25	85.95	86.00	1.49
MH-5	MH-4	23-2	87.51	17.0	84.0	86.25	85.95	86.01	1.50
MH-5	MH-4	26-9	87.49	20.7	84.0	86.25	85.95	86.03	1.46
MH-5	MH-4	23-3	87.51	24.6	84.0	86.25	85.95	86.04	1.47
MH-5	MH-4	26-8	87.49	25.5	84.0	86.25	85.95	86.04	1.45
MH-5	MH-4	23-4	87.51	29.4	84.0	86.25	85.95	86.06	1.45

Table C5B: USF Freeboard Results - 1996 Event

US MH	DS MH	Reach	USF (m)	Distance to MH (m)	Pipe Length (m)	US MH Elev (m)	DS MH Elev (m)	Intermediate Elev (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.25	85.95	86.07	1.42
MH-5	MH-4	23-5	87.51	37.0	84.0	86.25	85.95	86.08	1.43
MH-5	MH-4	26-6	87.49	39.3	84.0	86.25	85.95	86.09	1.40
MH-5	MH-4	23-6	87.51	43.2	84.0	86.25	85.95	86.11	1.40
MH-5	MH-4	25-10	87.49	47.5	84.0	86.25	85.95	86.12	1.37
MH-5	MH-4	24-1	87.51	51.4	84.0	86.25	85.95	86.13	1.38
MH-5	MH-4	25-9	87.49	55.1	84.0	86.25	85.95	86.15	1.34
MH-5	MH-4	24-2	87.51	59.0	84.0	86.25	85.95	86.16	1.35
MH-5	MH-4	25-8	87.49	59.9	84.0	86.25	85.95	86.17	1.32
MH-5	MH-4	24-3	87.51	63.8	84.0	86.25	85.95	86.18	1.33
MH-5	MH-4	25-7	87.49	67.5	84.0	86.25	85.95	86.19	1.30
MH-5	MH-4	24-4	87.51	71.4	84.0	86.25	85.95	86.21	1.30
MH-5	MH-4	25-6	87.49	73.7	84.0	86.25	85.95	86.21	1.28
MH-5	MH-4	24-5	87.13	76.2	84.0	86.25	85.95	86.22	0.91
MH-5	MH-4	24-6	87.13	80.7	84.0	86.25	85.95	86.24	0.89
MH-7	MH-8	22-1	86.55	11.4	88.3	86.02	85.72	85.76	0.79
MH-7	MH-8	23-12	87.51	12.0	88.3	86.02	85.72	85.76	1.75
MH-7	MH-8	23-11	87.51	18.2	88.3	86.02	85.72	85.78	1.73
MH-7	MH-8	22-2	86.55	19.1	88.3	86.02	85.72	85.79	0.76
MH-7	MH-8	23-10	87.51	25.8	88.3	86.02	85.72	85.81	1.70
MH-7	MH-8	22-3	86.55	26.7	88.3	86.02	85.72	85.81	0.74
MH-7	MH-8	23-9	87.51	30.6	88.3	86.02	85.72	85.83	1.68
MH-7	MH-8	22-4	86.55	34.3	88.3	86.02	85.72	85.84	0.71
MH-7	MH-8	23-8	87.51	38.2	88.3	86.02	85.72	85.85	1.66
MH-7	MH-8	22-5	86.55	41.9	88.3	86.02	85.72	85.86	0.69
MH-7	MH-8	23-7	87.51	44.4	88.3	86.02	85.72	85.87	1.64
MH-7	MH-8	24-12	87.51	52.6	88.3	86.02	85.72	85.90	1.61
MH-7	MH-8	21-1	86.55	52.9	88.3	86.02	85.72	85.90	0.65
MH-7	MH-8	24-11	87.51	60.2	88.3	86.02	85.72	85.93	1.58
MH-7	MH-8	21-2	86.55	60.6	88.3	86.02	85.72	85.93	0.62
MH-7	MH-8	24-10	87.51	65.0	88.3	86.02	85.72	85.94	1.57
MH-7	MH-8	21-3	86.55	68.2	88.3	86.02	85.72	85.95	0.60
MH-7	MH-8	24-9	87.51	72.6	88.3	86.02	85.72	85.97	1.54
MH-7	MH-8	21-4	86.55	75.8	88.3	86.02	85.72	85.98	0.57
MH-7	MH-8	24-8	87.13	77.4	88.3	86.02	85.72	85.98	1.15
MH-7	MH-8	21-5	86.55	83.4	88.3	86.02	85.72	86.00	0.55
MH-7	MH-8	24-7	87.13	85.0	88.3	86.02	85.72	86.01	1.12
MH-8	MH-6	6-1	86.6	11.2	12.7	85.72	85.69	85.72	0.88
MH-9	MH-10	8-1	86.42	8.4	56.0	85.91	85.87	85.88	0.54
MH-9	MH-10	7-3	86.49	19.4	56.0	85.91	85.87	85.88	0.61
MH-9	MH-10	7-2	86.49	27.0	56.0	85.91	85.87	85.89	0.60
MH-9	MH-10	7-1	86.49	34.6	56.0	85.91	85.87	85.89	0.60
MH-9	MH-10	6-3	86.6	45.6	56.0	85.91	85.87	85.90	0.70
MH-9	MH-10	6-2	86.6	53.3	56.0	85.91	85.87	85.91	0.69
								Min	0.49
								Max	1.75
								Average	0.92

Table C6A: Pipe Data and Hydraulic Simulation Results - 100-Year Chicago 3 Hour Event + 20%

U/S MH	D/S MH	U/S Invert (m)	D/S Invert (m)	U/S MH Cover Elevation (m)	D/S MH Cover Elevation (m)	Pipe Dia (mm)	Pipe Length (m)	Pipe Slope (%)	n (-)	Design Velocity (m/s)	Design Flow (m^3/s)	Peak Pipe Flow (m^3/s)	Peak Flow/ Design Flow	Surcharge U/S (m)	Time To peak (hh:mm)	Max U/S HGL (m)	Max D/S HGL (m)
MH-9	MH-10	85.707	85.492	88.57	88.49	450	56.0	0.3	0.013	0.90	0.14	0.05	0.36	-0.20	01/01/2019 01:19 AM	85.96	85.94
MH-8	MH-6	85.393	85.224	88.59	88.52	600	12.7	0.2	0.013	0.84	0.24	0.12	0.50	-0.21	01/01/2019 01:12 AM	85.78	85.74
MH-7	MH-8	85.720	85.393	87.9	88.59	450	88.3	0.2	0.013	0.80	0.13	0.12	0.93	-0.05	01/01/2019 01:12 AM	86.12	85.78
MH-6	MH-6559	85.224	85.180	88.52	88.33	750	29.2	0.2	0.013	0.98	0.43	0.51	1.19	-0.23	01/01/2019 01:12 AM	85.74	85.62
MH-5	MH-4	85.941	85.362	88.39	88.57	450	84.0	0.2	0.013	0.80	0.13	0.09	0.71	-0.13	01/01/2019 01:16 AM	86.26	86.00
MH-4	MH-6	85.362	85.224	88.57	88.52	675	31.5	0.2	0.013	1.05	0.38	0.40	1.06	-0.03	01/01/2019 01:14 AM	86.00	85.74
MH-3	MH-4	85.432	85.362	88.39	88.57	675	33.0	0.2	0.013	0.91	0.33	0.26	0.78	-0.08	01/01/2019 01:17 AM	86.03	86.00
MH-2	MH-3	85.527	85.432	88.49	88.39	600	13.0	0.2	0.013	0.85	0.24	0.19	0.81	-0.07	01/01/2019 01:17 AM	86.06	86.03
MH-17	MH-14	85.424	85.094	88.29	88.27	450	52.5	0.2	0.013	0.80	0.13	0.13	0.99	-0.05	01/01/2019 01:16 AM	85.82	85.60
MH-16	MH-17	85.529	85.424	88.2	88.29	375	10.2	0.3	0.013	0.86	0.09	0.05	0.50	-0.06	01/01/2019 01:27 AM	85.84	85.82
MH-15	MH-16	85.690	85.529	88.31	88.2	375	33.6	0.3	0.013	0.87	0.10	0.04	0.45	-0.19	01/01/2019 01:26 AM	85.88	85.84
MH-14	MH-6608	85.094	85.050	88.27	88.04	675	29.2	0.2	0.013	0.91	0.33	0.42	1.29	-0.16	01/01/2019 01:12 AM	85.60	85.48
MH-13	MH-14	85.287	85.094	88.38	88.27	525	21.4	0.2	0.013	0.89	0.19	0.20	1.05	-0.04	01/01/2019 01:14 AM	85.78	85.60
MH-12	MH-13	85.369	85.287	88.38	88.38	525	11.1	0.2	0.013	0.88	0.19	0.19	1.00	-0.07	01/01/2019 01:12 AM	85.83	85.78
MH-1	MH-2	85.968	85.527	88.53	88.49	375	72.2	0.3	0.013	0.87	0.10	0.02	0.24	-0.25	01/01/2019 01:13 AM	86.10	86.06
MH-11	MH-10	85.902	85.492	88.41	88.49	375	86.5	0.3	0.013	0.87	0.10	0.04	0.38	-0.20	01/01/2019 01:14 AM	86.07	85.94
MH-10	MH-12	85.492	85.369	88.49	88.38	525	46.4	0.2	0.013	0.89	0.19	0.19	1.00	-0.08	01/01/2019 01:12 AM	85.94	85.83
MH-100	MH-2	85.638	85.527	88.48	88.49	525	14.3	0.3	0.013	1.00	0.22	0.17	0.79	-0.07	01/01/2019 01:16 AM	86.10	86.06

Table C6B: USF Freeboard Results - 100-Year Chicago 3 Hour Event +20%

US MH	DS MH	Node	USF (m)	Pipe Length (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-1	MH-2	26-2	87.49	8.3	72.2	86.10	86.06	86.06	1.43
MH-1	MH-2	2-5	86.63	9.0	72.2	86.10	86.06	86.06	0.57
MH-1	MH-2	26-3	87.49	13.1	72.2	86.10	86.06	86.06	1.43
MH-1	MH-2	2-4	86.63	16.6	72.2	86.10	86.06	86.07	0.56
MH-1	MH-2	26-4	87.49	20.7	72.2	86.10	86.06	86.07	1.42
MH-1	MH-2	2-3	86.63	24.2	72.2	86.10	86.06	86.07	0.56
MH-1	MH-2	26-5	87.49	26.9	72.2	86.10	86.06	86.07	1.42
MH-1	MH-2	2-2	86.63	31.8	72.2	86.10	86.06	86.08	0.55
MH-1	MH-2	25-1	87.49	35.1	72.2	86.10	86.06	86.08	1.41
MH-1	MH-2	2-1	86.63	39.5	72.2	86.10	86.06	86.08	0.55
MH-1	MH-2	25-2	87.49	42.7	72.2	86.10	86.06	86.08	1.41
MH-1	MH-2	25-3	87.49	47.5	72.2	86.10	86.06	86.08	1.41
MH-1	MH-2	1-4	86.73	50.5	72.2	86.10	86.06	86.09	0.64
MH-1	MH-2	25-4	87.49	55.1	72.2	86.10	86.06	86.09	1.40
MH-1	MH-2	1-3	86.73	58.1	72.2	86.10	86.06	86.09	0.64
MH-1	MH-2	25-5	87.49	61.3	72.2	86.10	86.06	86.09	1.40
MH-1	MH-2	1-2	86.73	65.7	72.2	86.10	86.06	86.09	0.64
MH-1	MH-2	1-1	86.73	69.7	72.2	86.10	86.06	86.10	0.63
MH-10	MH-12	10-1	86.5	2.3	46.4	85.94	85.83	85.83	0.67
MH-10	MH-12	9-3	86.37	13.2	46.4	85.94	85.83	85.86	0.51
MH-10	MH-12	9-2	86.37	20.9	46.4	85.94	85.83	85.88	0.49
MH-10	MH-12	9-1	86.37	28.5	46.4	85.94	85.83	85.90	0.47
MH-10	MH-12	8-3	86.42	39.5	46.4	85.94	85.83	85.93	0.49
MH-10	MH-12	8-2	86.42	44.4	46.4	85.94	85.83	85.94	0.48
MH-11	MH-10	17-1	86.48	13.0	86.5	86.07	85.94	85.96	0.52
MH-11	MH-10	19-5	86.53	14.1	86.5	86.07	85.94	85.96	0.57
MH-11	MH-10	17-2	86.48	20.6	86.5	86.07	85.94	85.97	0.51
MH-11	MH-10	19-4	86.53	21.7	86.5	86.07	85.94	85.97	0.56
MH-11	MH-10	17-3	86.48	28.2	86.5	86.07	85.94	85.98	0.50
MH-11	MH-10	19-3	86.53	29.3	86.5	86.07	85.94	85.99	0.54
MH-11	MH-10	19-2	86.53	36.9	86.5	86.07	85.94	86.00	0.53
MH-11	MH-10	18-1	86.57	39.2	86.5	86.07	85.94	86.00	0.57
MH-11	MH-10	19-1	86.53	44.5	86.5	86.07	85.94	86.01	0.52
MH-11	MH-10	18-2	86.57	46.8	86.5	86.07	85.94	86.01	0.56
MH-11	MH-10	18-3	86.57	54.4	86.5	86.07	85.94	86.02	0.55
MH-11	MH-10	20-5	86.66	55.5	86.5	86.07	85.94	86.03	0.63
MH-11	MH-10	20-4	86.66	63.1	86.5	86.07	85.94	86.04	0.62
MH-11	MH-10	20-3	86.66	70.8	86.5	86.07	85.94	86.05	0.61
MH-11	MH-10	20-2	86.66	78.4	86.5	86.07	85.94	86.06	0.60
MH-11	MH-10	20-1	86.66	83.6	86.5	86.07	85.94	86.07	0.59
MH-12	MH-13	11-2	86.5	1.2	11.1	85.83	85.78	85.78	0.72
MH-12	MH-13	11-1	86.5	2.5	11.1	85.83	85.78	85.79	0.71
MH-12	MH-13	10-3	86.5	7.1	11.1	85.83	85.78	85.81	0.69
MH-12	MH-13	10-2	86.5	9.4	11.1	85.83	85.78	85.82	0.68
MH-13	MH-14	16-2	86.34	6.4	21.4	85.78	85.60	85.66	0.68
MH-13	MH-14	16-3	86.34	14.0	21.4	85.78	85.60	85.72	0.62
MH-13	MH-14	11-3	86.5	18.6	21.4	85.78	85.60	85.75	0.75
MH-15	MH-16	14-4	86.54	8.9	33.6	85.88	85.84	85.85	0.69
MH-15	MH-16	14-3	86.54	16.5	33.6	85.88	85.84	85.86	0.68
MH-15	MH-16	14-2	86.54	24.2	33.6	85.88	85.84	85.87	0.67
MH-15	MH-16	14-1	86.54	31.8	33.6	85.88	85.84	85.88	0.66
MH-16	MH-17	13-3	86.27	1.2	10.2	85.84	85.82	85.83	0.44
MH-17	MH-14	16-1	86.34	2.3	52.5	85.82	85.60	85.61	0.73
MH-17	MH-14	15-3	86.37	12.2	52.5	85.82	85.60	85.66	0.71
MH-17	MH-14	12-1	86.27	16.0	52.5	85.82	85.60	85.67	0.60
MH-17	MH-14	15-2	86.37	19.8	52.5	85.82	85.60	85.69	0.68
MH-17	MH-14	12-2	86.27	23.6	52.5	85.82	85.60	85.70	0.57
MH-17	MH-14	15-1	86.37	27.4	52.5	85.82	85.60	85.72	0.65
MH-17	MH-14	12-3	86.27	31.2	52.5	85.82	85.60	85.73	0.54
MH-17	MH-14	13-1	86.27	42.2	52.5	85.82	85.60	85.78	0.49
MH-17	MH-14	13-2	86.27	49.8	52.5	85.82	85.60	85.81	0.46
MH-2	MH-3	3-3	86.52	1.5	13.0	86.06	86.03	86.03	0.49
MH-2	MH-3	3-2	86.52	5.5	13.0	86.06	86.03	86.04	0.48
MH-2	MH-3	26-1	87.49	9.6	13.0	86.06	86.03	86.05	1.44
MH-2	MH-3	3-1	86.52	11.8	13.0	86.06	86.03	86.05	0.47
MH-3	MH-4	5-1	86.44	2.0	33.0	86.03	86.00	86.00	0.44
MH-3	MH-4	4-3	86.49	13.0	33.0	86.03	86.00	86.01	0.48
MH-3	MH-4	4-2	86.49	20.6	33.0	86.03	86.00	86.02	0.47
MH-3	MH-4	4-1	86.49	28.2	33.0	86.03	86.00	86.03	0.46
MH-4	MH-6	5-4	86.44	10.6	31.5	86.00	85.74	85.83	0.61
MH-4	MH-6	5-3	86.44	18.2	31.5	86.00	85.74	85.89	0.55
MH-4	MH-6	5-2	86.44	24.5	31.5	86.00	85.74	85.94	0.50
MH-5	MH-4	23-1	87.51	10.8	84.0	86.26	86.00	86.04	1.47
MH-5	MH-4	26-10	87.49	13.1	84.0	86.26	86.00	86.04	1.45
MH-5	MH-4	23-2	87.51	17.0	84.0	86.26	86.00	86.05	1.46
MH-5	MH-4	26-9	87.49	20.7	84.0	86.26	86.00	86.07	1.42
MH-5	MH-4	23-3	87.51	24.6	84.0	86.26	86.00	86.08	1.43
MH-5	MH-4	26-8	87.49	25.5	84.0	86.26	86.00	86.08	1.41
MH-5	MH-4	23-4	87.51	29.4	84.0	86.26	86.00	86.09	1.42

Table C6B: USF Freeboard Results - 100-Year Chicago 3 Hour Event +20%

US MH	DS MH	Node	USF (m)	Pipe Invert @ US MH (m)	Pipe Length (m)	US MH HGL (m)	DS MH HGL (m)	Intermediate HGL (m)	Freeboard (m)
MH-5	MH-4	26-7	87.49	33.1	84.0	86.26	86.00	86.10	1.39
MH-5	MH-4	23-5	87.51	37.0	84.0	86.26	86.00	86.12	1.39
MH-5	MH-4	26-6	87.49	39.3	84.0	86.26	86.00	86.12	1.37
MH-5	MH-4	23-6	87.51	43.2	84.0	86.26	86.00	86.14	1.37
MH-5	MH-4	25-10	87.49	47.5	84.0	86.26	86.00	86.15	1.34
MH-5	MH-4	24-1	87.51	51.4	84.0	86.26	86.00	86.16	1.35
MH-5	MH-4	25-9	87.49	55.1	84.0	86.26	86.00	86.17	1.32
MH-5	MH-4	24-2	87.51	59.0	84.0	86.26	86.00	86.18	1.33
MH-5	MH-4	25-8	87.49	59.9	84.0	86.26	86.00	86.19	1.30
MH-5	MH-4	24-3	87.51	63.8	84.0	86.26	86.00	86.20	1.31
MH-5	MH-4	25-7	87.49	67.5	84.0	86.26	86.00	86.21	1.28
MH-5	MH-4	24-4	87.51	71.4	84.0	86.26	86.00	86.22	1.29
MH-5	MH-4	25-6	87.49	73.7	84.0	86.26	86.00	86.23	1.26
MH-5	MH-4	24-5	87.13	76.2	84.0	86.26	86.00	86.24	0.89
MH-5	MH-4	24-6	87.13	80.7	84.0	86.26	86.00	86.25	0.88
MH-7	MH-8	22-1	86.55	11.4	88.3	86.12	85.78	85.83	0.72
MH-7	MH-8	23-12	87.51	12.0	88.3	86.12	85.78	85.83	1.68
MH-7	MH-8	23-11	87.51	18.2	88.3	86.12	85.78	85.85	1.66
MH-7	MH-8	22-2	86.55	19.1	88.3	86.12	85.78	85.86	0.69
MH-7	MH-8	23-10	87.51	25.8	88.3	86.12	85.78	85.88	1.63
MH-7	MH-8	22-3	86.55	26.7	88.3	86.12	85.78	85.88	0.67
MH-7	MH-8	23-9	87.51	30.6	88.3	86.12	85.78	85.90	1.61
MH-7	MH-8	22-4	86.55	34.3	88.3	86.12	85.78	85.91	0.64
MH-7	MH-8	23-8	87.51	38.2	88.3	86.12	85.78	85.93	1.58
MH-7	MH-8	22-5	86.55	41.9	88.3	86.12	85.78	85.94	0.61
MH-7	MH-8	23-7	87.51	44.4	88.3	86.12	85.78	85.95	1.56
MH-7	MH-8	24-12	87.51	52.6	88.3	86.12	85.78	85.98	1.53
MH-7	MH-8	21-1	86.55	52.9	88.3	86.12	85.78	85.98	0.57
MH-7	MH-8	24-11	87.51	60.2	88.3	86.12	85.78	86.01	1.50
MH-7	MH-8	21-2	86.55	60.6	88.3	86.12	85.78	86.01	0.54
MH-7	MH-8	24-10	87.51	65.0	88.3	86.12	85.78	86.03	1.48
MH-7	MH-8	21-3	86.55	68.2	88.3	86.12	85.78	86.04	0.51
MH-7	MH-8	24-9	87.51	72.6	88.3	86.12	85.78	86.06	1.45
MH-7	MH-8	21-4	86.55	75.8	88.3	86.12	85.78	86.07	0.48
MH-7	MH-8	24-8	87.13	77.4	88.3	86.12	85.78	86.08	1.05
MH-7	MH-8	21-5	86.55	83.4	88.3	86.12	85.78	86.10	0.45
MH-7	MH-8	24-7	87.13	85.0	88.3	86.12	85.78	86.11	1.02
MH-8	MH-6	6-1	86.6	11.2	12.7	85.78	85.74	85.78	0.82
MH-9	MH-10	8-1	86.42	8.4	56.0	85.96	85.94	85.94	0.48
MH-9	MH-10	7-3	86.49	19.4	56.0	85.96	85.94	85.95	0.54
MH-9	MH-10	7-2	86.49	27.0	56.0	85.96	85.94	85.95	0.54
MH-9	MH-10	7-1	86.49	34.6	56.0	85.96	85.94	85.95	0.54
MH-9	MH-10	6-3	86.6	45.6	56.0	85.96	85.94	85.95	0.65
MH-9	MH-10	6-2	86.6	53.3	56.0	85.96	85.94	85.96	0.64
								Min	0.44
								Max	1.68
								Average	0.87

APPENDIX D

Tables and Calculation Sheets

Table D-1: Rational Method CB Flow Calculations

CB	AREA (Ha) 2 YEAR				FLOW			Theoretical minimum ICD Size
	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Time of Conc. (min)	Intensity 2 Year (mm/h)	Peak Flow Q (l/s)	(mm)
1	0.026	0.52	0.04	0.04				
	0.041	0.58	0.07	0.10				
	0.087	0.33	0.08	0.18	10	76.805	14.1	**83**
2	0.089	0.71	0.18	0.18	10	76.805	13.5	**83**
3	0.089	0.71	0.18	0.18	10	76.805	13.5	**83**
4	0.099	0.63	0.17	0.17				
	0.020	0.52	0.03	0.20	10	76.805	15.5	**83**
5	0.100	0.68	0.19	0.19				
	0.055	0.66	0.10	0.29	10	76.805	22.3	**94**
6	0.067	0.71	0.13	0.13	10	76.805	10.2	**83**
7	0.055	0.68	0.10	0.10				
	0.055	0.63	0.10	0.20	10	76.805	15.4	**83**
8	0.052	0.69	0.10	0.10	10	76.805	7.7	**83**
9	0.069	0.59	0.11	0.11				
	0.066	0.58	0.11	0.22				
	0.027	0.58	0.04	0.26				
	0.026	0.49	0.04	0.30				
	0.026	0.49	0.04	0.33	10	76.805	25.5	**102**
10	0.052	0.72	0.10	0.10				
	0.071	0.71	0.14	0.24	10	76.805	18.8	**83**
11	0.027	0.51	0.04	0.04				
	0.076	0.53	0.11	0.15				
	0.082	0.58	0.13	0.28				
	0.051	0.61	0.09	0.37				
	0.024	0.49	0.03	0.40	10	76.805	30.8	**108**
12	0.066	0.72	0.13	0.13				
	0.049	0.73	0.10	0.23	10	76.805	17.8	**83**
13	0.033	0.56	0.05	0.05				
	0.040	0.57	0.06	0.11				
	0.039	0.58	0.06	0.18	10	76.805	13.6	**83**
14	0.049	0.75	0.10	0.10				
	0.047	0.42	0.05	0.16	10	76.805	12.0	**83**
15	0.021	0.50	0.03	0.03				
	0.014	0.54	0.02	0.05	10	76.805	3.9	**83**
16	0.065	0.59	0.11	0.11				
	0.053	0.70	0.10	0.21	10	76.805	16.0	**83**
17	0.113	0.75	0.24	0.24				
	0.030	0.49	0.04	0.28	10	76.805	21.2	**94**
18	0.073	0.72	0.15	0.15				
	0.047	0.58	0.08	0.22				
	0.021	0.50	0.03	0.25				
	0.026	0.59	0.04	0.29	10	76.805	22.5	**94**
19	0.087	0.67	0.16	0.16				
	0.104	0.70	0.20	0.36	10	76.805	28.0	**102**
20	0.070	0.70	0.14	0.14				
	0.070	0.73	0.14	0.28	10	76.805	21.4	**94**
21	0.097	0.73	0.20	0.20	10	76.805	15.1	**83**
22	0.100	0.74	0.21	0.21	10	76.805	15.8	**83**
23	0.086	0.73	0.17	0.17	10	76.805	13.4	**83**
24	0.099	0.74	0.20	0.20	10	76.805	15.6	**83**
25	0.081	0.71	0.16	0.16	10	76.805	12.3	**83**
26	0.097	0.71	0.19	0.19	10	76.805	14.7	**83**
27	0.006	0.48	0.01	0.01				
	0.024	0.61	0.04	0.05				
	0.038	0.51	0.05	0.10				
	0.035	0.54	0.05	0.16	10	76.805	11.9	**83**
28	0.059	0.40	0.07	0.07				
	0.032	0.35	0.03	0.10				
	0.028	0.57	0.04	0.14	10	76.805	10.9	**83**
29	0.021	0.61	0.04	0.04				
	0.010	0.55	0.02	0.05	10	76.805	3.9	**83**

Table D-2: PCSWMM Subcatchment Parameters

Node	Area (ac)	Width (ft)	Slope (%)	Imperv (%)	N-Imperv	N-Perv	S-Imperv (in)	S-Perv (in)	Curve Routing	Percent Routed (%)	Max Infil Rate (in/hr)	Min Infil Rate (in/hr)	Decay Constant (1/hr)	Drying Time (days)
A001NE	0.073	43	0.5	74	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A001R1	0.047	39	1.5	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A001R2	0.021	18	1.5	43	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A001R3	0.026	22	1.5	56	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A003NE	0.065	21	0.5	55	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A003NW	0.113	64	0.5	78	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A003R1	0.059	51	1.5	28	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A003R2	0.032	33	1.5	22	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A003R3	0.028	23	2.0	53	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A003SE	0.053	30	0.5	71	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A003SW	0.030	33	0.5	41	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A004NE	0.049	29	0.5	78	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A004NW	0.021	25	0.5	43	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A004R2	0.021	17	1.0	59	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A004R3	0.010	8	1.0	50	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A004SE	0.047	19	0.5	31	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A004SW	0.014	19	1.0	48	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005N1	0.087	58	0.5	67	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005NE	0.097	53	0.5	76	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005NW	0.070	58	0.5	72	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005S1	0.104	43	1.0	71	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005SE	0.100	53	0.5	77	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A005SW	0.070	43	1.0	75	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A007NE	0.099	53	0.5	77	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A007NW	0.097	44	2.0	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A007SE	0.086	53	0.5	75	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A007SW	0.081	44	2.0	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A009NE	0.066	33	0.5	74	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A009NW	0.027	33	0.5	44	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A009R1	0.076	62	1.5	47	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A009R2	0.082	68	1.5	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A009R3	0.051	46	1.5	59	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A009SE	0.049	27	0.5	75	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A009SW	0.024	27	0.5	42	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A010NE	0.052	28	0.5	74	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A010NW	0.026	28	0.5	41	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A010R1	0.069	60	1.5	55	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R2	0.066	56	2.0	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R3	0.027	28	2.0	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R4	0.033	27	1.0	51	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R5	0.040	33	1.5	53	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010R6	0.039	32	1.0	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A010SE	0.071	28	0.5	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A010SW	0.026	28	0.5	41	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A011NE	0.089	59	0.5	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A011SW	0.089	59	0.5	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A013NE	0.052	26	0.5	70	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A014NE	0.026	31	1.0	46	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A014R3	0.041	34	1.0	54	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A014R4	0.087	77	1.0	19	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A015NE	0.099	74	0.5	61	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A015NW	0.100	74	0.5	68	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A015SE	0.020	25	1.0	46	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A015SW	0.055	25	1.0	65	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A017NE	0.055	38	0.5	69	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A017NW	0.055	34	0.5	62	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A017R1	0.038	31	1.5	44	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A017R2	0.024	20	1.5	59	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A017R5	0.006	9	1.0	40	0.013	0.25	1.57	4.67	PERVIOUS	100	76.2	13.2	4.14	7
A017SW	0.067	46	0.5	73	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
A100	0.680	45	1.0	86	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
AR1	0.035	31	1.0	49	0.013	0.25	1.57	4.67	OUTLET	100	76.2	13.2	4.14	7
Total	4.042	-	-	66										

D-3A- ICD Head Flow Rating Curves

Head (m)	Release Rate (L/s) by ICD Diameter (mm)						
	83	94	102	108	127	152	178
0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.050	3.3	4.3	5.0	5.6	7.8	11.1	15.3
0.100	4.7	6.0	7.1	8.0	11.0	15.8	21.6
0.150	5.8	7.4	8.7	9.7	13.5	19.3	26.5
0.200	6.6	8.5	10.0	11.3	15.6	22.3	30.6
0.250	7.4	9.5	11.2	12.6	17.4	24.9	34.2
0.300	8.1	10.4	12.3	13.8	19.1	27.3	37.4
0.350	8.8	11.3	13.3	14.9	20.6	29.5	40.4
0.400	9.4	12.1	14.2	15.9	22.0	31.5	43.2
0.450	10.0	12.8	15.1	16.9	23.3	33.4	45.8
0.500	10.5	13.5	15.9	17.8	24.6	35.2	48.3
0.550	11.0	14.1	16.6	18.7	25.8	37.0	50.7
0.600	11.5	14.8	17.4	19.5	26.9	38.6	52.9
0.650	12.0	15.4	18.1	20.3	28.0	40.2	55.1
0.700	12.4	15.9	18.8	21.0	29.1	41.7	57.2
0.750	12.9	16.5	19.4	21.8	30.1	43.2	59.2
0.800	13.3	17.0	20.1	22.5	31.1	44.6	61.1
0.850	13.7	17.6	20.7	23.2	32.1	45.9	63.0
0.900	14.1	18.1	21.3	23.9	33.0	47.3	64.8
0.950	14.5	18.6	21.9	24.5	33.9	48.6	66.6
1.000	14.9	19.1	22.4	25.2	34.8	49.8	68.3
1.050	15.2	19.5	23.0	25.8	35.6	51.1	70.0
1.100	15.6	20.0	23.5	26.4	36.5	52.3	71.7
1.150	15.9	20.4	24.1	27.0	37.3	53.4	73.3
1.200	16.3	20.9	24.6	27.6	38.1	54.6	74.9
1.250	16.6	21.3	25.1	28.1	38.9	55.7	76.4
1.300	16.9	21.7	25.6	28.7	39.7	56.8	77.9
1.350	17.3	22.1	26.1	29.2	40.4	57.9	79.4
1.400	17.6	22.6	26.6	29.8	41.2	59.0	80.9
1.450	17.9	22.9	27.0	30.3	41.9	60.0	82.3
1.500	18.2	23.3	27.5	30.8	42.6	61.0	83.7
1.550	18.5	23.7	27.9	31.3	43.3	62.0	85.1
1.600	18.8	24.1	28.4	31.8	44.0	63.0	86.4

(1) Head take from the centre of the Orifice

Coefficient of Discharge = 0.62

Table D-4A: Capacity of Lead Pipes

	Release Rate (L/s) by Pipe Diameter (mm)						
Head (m)	100	150	200	250	300	375	450
0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.050	6.4	14.4	25.5	39.9	57.4	89.7	129.2
0.100	9.0	20.3	36.1	56.4	81.2	126.9	182.7
0.150	11.0	24.9	44.2	69.1	99.4	155.4	223.7
0.200	12.8	28.7	51.0	79.7	114.8	179.4	258.3
0.250	14.3	32.1	57.1	89.1	128.4	200.6	288.8
0.300	15.6	35.2	62.5	97.7	140.6	219.7	316.4
0.350	16.9	38.0	67.5	105.5	151.9	237.3	341.8
0.400	18.0	40.6	72.2	112.8	162.4	253.7	365.3
0.450	19.1	43.1	76.5	119.6	172.2	269.1	387.5
0.500	20.2	45.4	80.7	126.1	181.5	283.7	408.5
0.550	21.2	47.6	84.6	132.2	190.4	297.5	428.4
0.600	22.1	49.7	88.4	138.1	198.9	310.7	447.5
0.650	23.0	51.7	92.0	143.7	207.0	323.4	465.7
0.700	23.9	53.7	95.5	149.2	214.8	335.6	483.3
0.750	24.7	55.6	98.8	154.4	222.3	347.4	500.3
0.800	25.5	57.4	102.1	159.5	229.6	358.8	516.7
0.850	26.3	59.2	105.2	164.4	236.7	369.8	532.6
0.900	27.1	60.9	108.3	169.1	243.6	380.6	548.0
0.950	27.8	62.6	111.2	173.8	250.2	391.0	563.0
1.000	28.5	64.2	114.1	178.3	256.7	401.2	577.7
1.050	29.2	65.8	116.9	182.7	263.1	411.1	591.9
1.100	29.9	67.3	119.7	187.0	269.3	420.7	605.9
1.150	30.6	68.8	122.4	191.2	275.3	430.2	619.5
1.200	31.2	70.3	125.0	195.3	281.2	439.4	632.8
1.250	31.9	71.8	127.6	199.3	287.0	448.5	645.9
1.300	32.5	73.2	130.1	203.3	292.7	457.4	658.6
1.350	33.1	74.6	132.6	207.2	298.3	466.1	671.2
1.400	33.8	75.9	135.0	211.0	303.8	474.7	683.5
1.450	34.4	77.3	137.4	214.7	309.2	483.1	695.6
1.500	34.9	78.6	139.8	218.4	314.4	491.3	707.5
1.550	35.5	79.9	142.1	222.0	319.6	499.4	719.2
1.600	36.1	81.2	144.3	225.5	324.8	507.4	730.7

Short tube orifice coefficient = 0.82

Short tube release rate = $C\pi(Dia/1000)^2/4\times(2\times9.81\times H)^{0.5}\times1000$

Table D-4B: PCSWMM Curves for Catchbasins [1]

CB: Fish: Sag	
Depth (m)	Q_{approx} (m³/s)
0.00	0.000
0.05	0.010
0.06	0.019
0.065	0.020
0.07	0.023
0.08	0.027
0.09	0.042
0.10	0.060
0.104	0.065
0.11	0.075
0.12	0.082
0.13	0.098
0.14	0.100
0.15	0.100
0.16	0.100

Table D-4C: PCSWMM Curves for Catchbasins [1]

Catchbasin: Sag 2% Close Slope	
Depth (m)	Q_{approx} (m³/s)
0.00	0.000
0.018	0.002
0.03	0.010
0.04	0.018
0.05	0.030
0.06	0.050
0.07	0.080
0.08	0.100
0.09	0.100
0.11	0.100

Table D-4D: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 0.5% long: OPSD 600.01	
Depth (m)	Q_{approx} (m³/s)
0.00	0.000
0.05	0.004
0.06	0.005
0.065	0.009
0.07	0.012
0.08	0.015
0.09	0.025
0.10	0.036
0.104	0.039
0.11	0.045
0.14	0.050
0.15	0.050

Table D-4E: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 1% long: OPSD 600.01	
Depth (m)	Q_{approx} (m³/s)
0.00	0.000
0.05	0.006
0.06	0.007
0.065	0.012
0.07	0.014
0.08	0.022
0.09	0.035
0.10	0.046
0.104	0.050
0.11	0.050

Table D-4F: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 2% long: OPSD 600.01	
Depth (m)	Q_{approx} (m³/s)
0.00	0.000
0.05	0.008
0.06	0.010
0.065	0.014
0.07	0.018
0.08	0.027
0.09	0.040
0.10	0.050
0.104	0.050
0.11	0.050

Table D-4G: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 4% long: OPSD 600.01	
Depth (m)	Q_{approx} (m³/s)
0.00	0.000
0.05	0.010
0.06	0.012
0.065	0.018
0.07	0.023
0.08	0.034
0.09	0.044
0.10	0.050
0.104	0.050
0.11	0.050

Table D-4H: PCSWMM Curves for Catchbasins [2]

CB: Fish: 2% cross: 5% long: OPSD 600.01	
Depth (m)	Q_{approx} (m³/s)
0.00	0.000
0.05	0.011
0.06	0.013
0.065	0.019
0.07	0.023
0.08	0.035
0.09	0.044
0.10	0.050
0.104	0.050
0.11	0.050

[1] For catchbasins on sags / low points, as provided by the City of Ottawa

[2] For catchbasins on a constant slope, as provided by the City of Ottawa

Table D-5: ICD Type and Inlet Capture Results for the 2-Year Chicago Storm

Catch Basin ID	Applied ICD (mm)	Regional (25-Yr) Peak Flow (m³/s)	Minimum Theoretical ICD Size (Rational) (mm)	Total Simulated Approach Flow (m³/s)	Total Simulated Capture (m³/s)	Max Ponding Depth (cm)	Flow Spread (m)	% of Total Travel Lane **
CB_1	152	0.014	83	0.008	0.008	2	0.65	8%
CB_2	83	0.013	83	0.014	0.014	5	1.63	19%
CB_3	83	0.013	83	0.014	0.014	5	1.63	19%
CICB_4	83	0.016	83	0.019	0.019	4	1.31	15%
CICB_5	94	0.022	94	0.019	0.019	4	1.31	15%
CB_6	127	0.010	83	0.014	0.014	5	1.63	19%
CB_7	127	0.015	83	0.014	0.014	5	1.63	19%
CB_8	102	0.008	83	0.003	0.003	2	0.65	8%
CB_9	102	0.026	102	0.036	0.035	6	1.96	23%
CB_10	94	0.019	83	0.015	0.015	6	1.96	23%
CB_11	108	0.031	108	0.038	0.037	5	1.63	19%
CB_12	83	0.018	83	0.014	0.014	5	1.63	19%
CB_13	152	0.014	83	0.012	0.012	-	-	-
CB_14	83	0.012	83	0.007	0.007	4	1.31	15%
CB_15	83	0.004	83	0.007	0.007	4	1.31	15%
CB_16	83	0.016	83	0.026	0.026	8	2.62	31%
CB_17	94	0.021	94	0.026	0.026	8	2.62	31%
CB_18	94	0.023	94	0.013	0.013	3	0.98	12%
CICB_19	102	0.028	102	0.032	0.032	5	1.63	19%
CICB_20	94	0.021	94	0.031	0.031	5	1.63	19%
CB_21	83	0.015	83	0.016	0.016	6	1.96	23%
CB_22	83	0.016	83	0.016	0.016	6	1.96	23%
CB_23	83	0.013	83	0.015	0.015	6	1.96	23%
CB_24	83	0.016	83	0.015	0.015	6	1.96	23%
CB_25	127	0.012	83	0.014	0.014	5	1.63	19%
CB_26	127	0.015	83	0.014	0.014	5	1.63	19%
CB_27	152	0.012	83	0.009	0.009	2	0.65	8%
CB_28	83	0.011	83	0.007	0.007	-	-	-
CB_29	83	0.004	83	0.004	0.004	-	-	-

Table D-6: Ponding at Major Low Points for the 100-Year Chicago Storm & 100-Year Chicago Storm +20%

Catch Basin ID	Major Node	Total Depth		Water Surface Elevation	
		100 Year 3 Hr Chi (cm)	100 Year 3 Hr Chi+20% (cm)	100 Year 3 Hr Chi (m)	100 Year 3 Hr Chi+20% (m)
CB_1	J5	5.0	6.0	87.94	87.96
CB_2	J3	22.0	23.0	88.42	88.44
CB_3	J3	22.0	23.0	88.42	88.44
CICB_4	J14	22.0	25.0	88.25	88.28
CICB_5	J14	22.0	25.0	88.25	88.28
CB_6	J20	9.0	12.0	88.16	88.19
CB_7	J20	9.0	12.0	88.16	88.19
CB_8	J25	5.0	8.0	88.27	88.29
CB_9	J31	22.0	24.0	88.35	88.38
CB_10	J31	22.0	24.0	88.35	88.38
CB_11	J37	19.0	20.0	88.43	88.45
CB_12	J37	19.0	20.0	88.43	88.45
CB_13	-	-	-	-	-
CB_14	J48	13.0	22.0	88.44	88.53
CB_15	J48	13.0	22.0	88.44	88.53
CB_16	J56	25.0	30.0	88.49	88.54
CB_17	J56	25.0	30.0	88.49	88.54
CB_18	J4	12.0	16.0	88.50	88.55
CICB_19	J69	26.0	30.0	88.44	88.48
CICB_20	J69	26.0	30.0	88.44	88.48
CB_21	J76	21.0	26.0	88.47	88.53
CB_22	J76	21.0	26.0	88.47	88.53
CB_23	J83	16.0	21.0	88.45	88.50
CB_24	J83	16.0	21.0	88.45	88.50
CB_25	J92	9.0	10.0	87.82	87.83
CB_26	J92	9.0	10.0	87.82	87.83
CB_27	J5	5.0	6.0	87.94	87.96
CB_28	-	-	-	-	-
CB_29	-	-	-	-	-
MAX		26.0	30.0		

Table D-7: Major System Flow Depths 100-Year Peak Flow

Link Name	Transect	Max Velocity (m/s)	Max Depth (m)	Depth x Velocity (m²/s)
C1	16.5mROW-No-Sidewalk	0.21	0.10	0.02
C101	18mROWwSidewalk	0.58	0.04	0.02
C12	14mROW-No-Sidewalk	0.08	0.14	0.01
C15	14mROW-No-Sidewalk	0.07	0.14	0.01
C16	18mROWwSidewalk	0.14	0.05	0.01
C18	18mROWwSidewalk	0.08	0.05	0.00
C2	16.5mROW-No-Sidewalk	0.06	0.19	0.01
C20	18mROWwSidewalk	0.14	0.05	0.01
C23	18mROWwSidewalk	0.64	0.04	0.03
C26	18mROWwSidewalk	0.46	0.05	0.02
C27	18mROWwSidewalk	0.13	0.08	0.01
C30	18mROWwSidewalk	0.09	0.17	0.02
C32	18mROWwSidewalk	0.07	0.17	0.01
C33	18mROWwSidewalk	0.18	0.08	0.01
C35	18mROWwSidewalk	0.14	0.11	0.02
C38	18mROWwSidewalk	0.04	0.10	0.00
C4	16.5mROW-No-Sidewalk	0.00	0.11	0.00
C40	18mROWwSidewalk	0.00	0.01	0.00
C46	18mROWwSidewalk	0.05	0.09	0.00
C48	16.5mROW-No-Sidewalk	0.12	0.08	0.01
C51	16.5mROW-No-Sidewalk	0.74	0.05	0.04
C53	16.5mROW-No-Sidewalk	0.07	0.15	0.01
C56	16.5mROW-No-Sidewalk	0.17	0.19	0.03
C60_1	16.5mROW-No-Sidewalk	0.00	0.06	0.00
C60_2	16.5mROW-No-Sidewalk	0.44	0.13	0.06
C62	16.5mROW-No-Sidewalk	0.00	0.00	0.00
C64	14mROW-No-Sidewalk	0.00	0.06	0.00
C66	14mROW-No-Sidewalk	0.12	0.19	0.02
C69	14mROW-No-Sidewalk	0.09	0.19	0.02
C7	16.5mROW-No-Sidewalk	0.00	0.00	0.00
C71	16.5mROW-No-Sidewalk	0.00	0.05	0.00
C74	16.5mROW-No-Sidewalk	0.00	0.10	0.00
C76	16.5mROW-No-Sidewalk	0.07	0.19	0.01
C77	16.5mROW-No-Sidewalk	0.09	0.10	0.01
C79	18mROWwSidewalk	0.00	0.05	0.00
C81	18mROWwSidewalk	0.07	0.13	0.01
C83	18mROWwSidewalk	0.00	0.08	0.00
C85	18mROWwSidewalk	0.00	0.00	0.00
C86	18mROWwSidewalk	0.00	0.00	0.00
C88	18mROWwSidewalk	0.00	0.01	0.00
C9	14mROW-No-Sidewalk	0.00	0.03	0.00
C90	18mROWwSidewalk	0.06	0.05	0.00
C91	18mROWwSidewalk	0.11	0.06	0.01
C99_1	18mROWwSidewalk	0.41	0.04	0.02
C99_2	18mROWwSidewalk	0.44	0.05	0.02
Maj-004_1	18mROWwSidewalk	0.00	0.02	0.00
Max		**0.74**	**0.19**	**0.06**

Table D-8: Major System Flow Depths 100-Year+20% Peak Flow

Link Name	Transect	Max Velocity (m/s)	Max Depth (m)	Depth x Velocity (m²/s)
C1	16.5mROW-No-Sidewalk	0.21	0.12	0.03
C101	18mROWwSidewalk	0.73	0.05	0.04
C12	14mROW-No-Sidewalk	0.09	0.16	0.01
C15	14mROW-No-Sidewalk	0.09	0.17	0.02
C16	18mROWwSidewalk	0.20	0.07	0.01
C18	18mROWwSidewalk	0.12	0.08	0.01
C2	16.5mROW-No-Sidewalk	0.07	0.21	0.01
C20	18mROWwSidewalk	0.15	0.08	0.01
C23	18mROWwSidewalk	0.84	0.06	0.05
C26	18mROWwSidewalk	0.65	0.07	0.05
C27	18mROWwSidewalk	0.20	0.11	0.02
C30	18mROWwSidewalk	0.10	0.20	0.02
C32	18mROWwSidewalk	0.08	0.20	0.02
C33	18mROWwSidewalk	0.26	0.10	0.03
C35	18mROWwSidewalk	0.17	0.13	0.02
C38	18mROWwSidewalk	0.05	0.11	0.01
C4	16.5mROW-No-Sidewalk	0.00	0.12	0.00
C40	18mROWwSidewalk	0.40	0.03	0.01
C46	18mROWwSidewalk	0.08	0.17	0.01
C48	16.5mROW-No-Sidewalk	0.25	0.16	0.04
C51	16.5mROW-No-Sidewalk	0.93	0.09	0.08
C53	16.5mROW-No-Sidewalk	0.18	0.19	0.03
C56	16.5mROW-No-Sidewalk	0.18	0.24	0.04
C60_1	16.5mROW-No-Sidewalk	0.00	0.08	0.00
C60_2	16.5mROW-No-Sidewalk	0.47	0.17	0.08
C62	16.5mROW-No-Sidewalk	0.00	0.01	0.00
C64	14mROW-No-Sidewalk	0.03	0.09	0.00
C66	14mROW-No-Sidewalk	0.13	0.23	0.03
C69	14mROW-No-Sidewalk	0.10	0.23	0.02
C7	16.5mROW-No-Sidewalk	0.00	0.00	0.00
C71	16.5mROW-No-Sidewalk	0.03	0.08	0.00
C74	16.5mROW-No-Sidewalk	0.04	0.14	0.01
C76	16.5mROW-No-Sidewalk	0.07	0.24	0.02
C77	16.5mROW-No-Sidewalk	0.31	0.16	0.05
C79	18mROWwSidewalk	0.11	0.10	0.01
C81	18mROWwSidewalk	0.07	0.19	0.01
C83	18mROWwSidewalk	0.02	0.11	0.00
C85	18mROWwSidewalk	0.23	0.01	0.00
C86	18mROWwSidewalk	0.38	0.01	0.00
C88	18mROWwSidewalk	0.24	0.02	0.00
C9	14mROW-No-Sidewalk	0.00	0.04	0.00
C90	18mROWwSidewalk	0.07	0.07	0.01
C91	18mROWwSidewalk	0.11	0.07	0.01
C99_1	18mROWwSidewalk	0.55	0.07	0.04
C99_2	18mROWwSidewalk	0.54	0.06	0.03
Maj-004_1	18mROWwSidewalk	0.20	0.08	0.02
Max		**0.93**	**0.24**	**0.08**

File: D07-16-21-0001

MENU OF CONDITIONS
FOR DRAFT APPROVAL
CAIVAN DEVELOPMENT CORPOARATION
CAIVAN (MER BLEUE) INC

DRAFT APPROVED DD/MM/YYYY

INDEX

The City of Ottawa's conditions applying to the draft approval of Caivan Development Corporation's Caivan (Mer Bleue) Inc. Subdivision (File No. D07-16-21-001), ADDRESS 2275 Mer Bleue Rd, Ottawa ON, are as follows:

This approval applies to the draft plan certified by C. M. Fox, Ontario Land Surveyor, J. D. Barnes Ltd., dated July 27, 2021, showing 25 Residential Blocks, 4 streets, 1 Multi-Use Block, and 2 pathway blocks.

This approval applies to the approved conceptual plans and reports in support of the draft plan as follows (list plans, reports and studies associated with the draft approval):

1) Functional Servicing Report, prepared by David Shaeffer Engineering Ltd., Project No. 20-1214, dated June 9, 2021
2) Concept Grading Plan, prepared by David Shaeffer Engineering Ltd., Project No. 20-1214 Figure 3, dated June 2021
3) Storm Servicing Plan, prepared by David Shaeffer Engineering Ltd., Project No. 20-1214 Figure 4, dated June 2021
4) Sanitary Servicing Plan, prepared by David Shaeffer Engineering Ltd., Project No. 20-1214 Figure 5, dated June 2021
5) Watermain Servicing Plan, prepared by David Shaeffer Engineering Ltd., Project No. 20-1214 Figure 6, dated June 2021
6) Erosion and Sediment Control Plan, prepared by David Shaeffer Engineering Ltd., Project No. 20-1214 Figure 7, dated June 2021
7) Geotechnical Investigation, prepared by Paterson Group, Report PG5521-1 Revision 1, dated March 10, 2021
8) Phase 1 ESA, prepared by Paterson Group, Report PE5050-1, dated Sep 30, 2020.
9) Planning Rationale, prepared by Fotenn, Revision 2, dated June 10, 2021
10) Traffic Noise Feasibility Assessment, prepared by Gradient Wind, Report 20-281 R1, dated June 9, 2021
11) Urban Design Brief, prepared by NAK Design Strategies, 3rd Submission, dated June 2021
12) Transportation Impact Assessment, prepared by CGH Transportation, PN 2020-82, dated March 2021
13) Transportation Impact Assessment Addendum, prepared by CGH Transportation, dated June 9, 2021
14) Plan of Survey & Topo, prepared by Annis, O'Sullivan, Vollebekk Ltd., dated September 2019
15) Species at Risk Memorandum, prepared by Kilgour & Associates, File CAIV 1140, dated December 17, 2020
16) Rendering - Future Condo Block, prepared by Kirkor, Project No. 20-084, dated January 7, 2021

Concept Plan, prepared by NAK Design Strategies, dated June 2021

		Subject to the conditions below, these plans and reports may require updating and/or additional details prior to final approval.	
		The Owner agrees, by entering into a Subdivision Agreement, to satisfy all terms, conditions and obligations, financial and otherwise, of the City of Ottawa, at the Owner's sole expense, all to the satisfaction of the City.	**Clearing Agency**[i]
		General	
1.	**G1**	Prior to the issuance of a Commence Work Notification, the Owner shall obtain such permits as may be required from Municipal or Provincial authorities and shall file copies thereof with the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
2.		The Owner agrees and acknowledges that prior to any site works they will adhere to the Site Alteration By-law-164. Furthermore, they will prepare a descriptive handout for the residents of the area to the satisfaction of the General Manager, Planning, Infrastructure & Economic Development Department.	**OTTAWA Planning**
3.	**G2**	Prior to commencing construction, the Owner shall enter into a subdivision agreement with the City. The subdivision agreement shall, among other matters, require that the Owner post securities in a format approved by the City Solicitor, in an amount of 100% of the estimated cost of all works, save and except non-municipal buildings. The aforementioned security for site works shall be for works on both private and public property and shall include, but not be limited to, lot grading and drainage, landscaping and driveways, roads and road works, road drainage, underground infrastructure and services (storm, sanitary, watermains), streetlights, stormwater management works and park works. The amount secured by the City shall be determined by the General Manager, Planning, Infrastructure and Economic Development Department, based on current City tender costs, which costs shall be reviewed and adjusted annually. Securities for on-site works may be at a reduced rate subject to the approval of the General Manager, Planning, Infrastructure and Economic Development Department. Engineering, Inspection and Review fees will be collected based on the estimated cost of the works (+HST) and a park review and inspection fee will be based on 4% (+HST) of the total value of the park works as noted herein and in accordance with the City's Fees By-law for planning applications (By-law No. 2018-24 or as amended).	**OTTAWA Planning**

4.	**G3**	The Owner acknowledges and agrees that any residential blocks for street-oriented dwelling units on the final Plan shall be configured to ensure that there will be no more than 25 units per block.	**OTTAWA Planning**
5.	**G4**	The Owner acknowledges and agrees that any person who, prior to the draft plan approval, entered into a purchase and sale agreement with respect to lots or blocks created by this Subdivision, shall be permitted to withdraw from such agreement without penalty and with full refund of any deposit paid, up until the acknowledgement noted above has been executed. The Owner agrees to provide to the General Manager, Planning, Infrastructure and Economic Development Department an acknowledgement from those purchasers who signed a purchase and sale agreement before this Subdivision was draft approved, that the Subdivision had not received draft approval by the City. The Owner agrees that the purchase and sale agreements signed prior to draft approval shall be amended to contain a clause to notify purchasers of this fact, and to include any special warning clauses, such as but not limited to Noise Warnings and easements.	**OTTAWA Legal**
6.	**G5**	All prospective purchasers shall be informed through a clause in the agreements of purchase and sale of the presence of lightweight fill on the lands, and that the presence of such lightweight fill may result in specific restrictions on landscaping, pools, additions, decks and fencing	**OTTAWA Legal**
7.	**G6**	The Owner, or his agents, shall not commence or permit the commencement of any site related works until such time as a pre-construction meeting has been held with Planning, Infrastructure and Economic Development Department staff and until the City issues a Commence Work Notification.	**OTTAWA Planning**
8.		The Owner agrees and acknowledges that prior to any site works to provide a Pre-Inspection Survey carried out by a Professional Engineer licensed in the province of Ontario that includes seismic monitoring. Furthermore, a post inspection will be also provided. Such pre-post inspection survey shall be prepared for all buildings or parking structures likely to be affected by the works within 75 metres of the location where works may occur. The standard inspection procedure shall include the provision of an explanatory letter to the owner(s) or occupant and owner with a formal request for permission to carry out an inspection. The pre-post inspection survey shall include, as a minimum, the following information: a. Type of structure, including type of construction.	**OTTAWA Planning**

		b. Location identification and description of existing differential settlements, including visible cracks in walls, floors, and ceiling, including a diagram, if applicable, room-by-room. All other apparent structural and cosmetic damage or defect must also be noted. Defects shall be described, including dimensions, wherever possible. c. Photographs or video as necessary for recording areas of significant concern. A copy of the pre-post inspection survey shall be provided to the owner of that residence or property upon request.	
9.		The Owner agrees and acknowledges that their Contractor is required to provide Shop Drawings for any special structures typically not available as per the City detail standards and product listing to the City to the satisfaction of the General Manager, Planning, Infrastructure & Economic Development Department prior to installations of those works. Shop drawings shall be stamped and signed by a professional Engineer licensed in the Province of Ontario. All costs for Shop Drawings shall be borne by the Owner or his contractors. The Owner agrees and acknowledges that their Contractor is required to provide Shop Drawings for TWSI's as per the City S.P. No. F-3512 to the City to the satisfaction of the General Manager, Planning, Infrastructure & Economic Development Department.	**OTTAWA Planning**
10.		The Owner shall have competent professional engineering inspection personnel on-site during the period of construction and the General Manager, Planning, Infrastructure & Economic Development Department shall have the right at all times to inspect the installation of the Works. Should it be found in the sole opinion of the General Manager, Planning, Infrastructure & Economic Development Department that such personnel are not on site or are incompetent in the performance of their duties, or that the said Works are not being carried out in accordance with approved plans or specifications and in accordance with good engineering practice, then the General Manager, Planning, Infrastructure & Economic Development Department may order all work in the project to be stopped.	**OTTAWA Planning**
		Landowners Agreement	
11.	**LA1**	Prior to registration or early servicing, the Owner agrees to provide the City with a clearance letter from the neighbouring developer [*Minto*], confirming that the Owner has contributed and that a Cost Sharing Agreement (if applicable) and all of the obligations, financial and otherwise, have been fulfilled.	**LG**
		Zoning	

12.	**Z1**	The Owner agrees that prior to registration of the Plan of Subdivision, the Owner shall ensure that the proposed Plan of Subdivision shall conform with a Zoning By-law approved under the requirements of the *Planning Act*, with all possibility of appeal to the Ontario Municipal Board exhausted.	**OTTAWA Planning**
13.	**Z2**	The Owner undertakes and agrees that prior to the registration of the Plan of Subdivision, the Owner shall deliver to the City a certificate executed by an Ontario Land Surveyor showing that the area and frontage of all lots and blocks within the Subdivision are in accordance with the applicable Zoning By-law.	**OTTAWA Planning**
		Roadway Modifications	
14.	**RM1**	The Owner shall pay all expenses associated with all works related to roadway modifications, and shall provide financial security in the amount of 100% of the cost of implementing the required works.	**OTTAWA Planning**
15.	**RM2**	The Owner agrees to provide a Development Information Form and Geometric Plan indicating: a) Road Signage and Pavement Marking for the subdivision; b) Intersection control measure at new internal intersections; and c) location of depressed curbs and TWSIs; prior to the earlier of registration of the Agreement or early servicing. Such form and plan shall be to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning Transpo Plg**
16.	**RM4**	The Owner agrees that where road modification is identified and such modification is deemed necessary in order to facilitate the development of the subdivision as per the supporting transportation studies, the Owner shall either enter into a Roadway Modification Agreement with the City, or, at the City's discretion, have the necessary provisions incorporated into the subdivision agreement.	**OTTAWA Planning**
17.		The Owner shall be responsible for 100% of the cost of temporary and final pavement markings. The City will apply the final pavement markings on the top lift of asphalt where applications are scheduled between 15 May and 15 November. Before 15 May or after 15 November the contractor is responsible for applying the final makings. The contractor, at all times, is responsible for applying and removing any temporary pavement markings required during construction, as well as installing all markings (including final markings) applied on base course asphalt.	**OTTAWA Planning**
18.		The Owner shall be responsible for 100% of the cost and installation of all permanent and temporary street name signs and traffic signs that may be	**OTTAWA Planning**

		required in accordance with City specifications. All signs shall be installed and located to the satisfaction of the City and installed prior to the City's acceptance of the roads within the subdivision.	
19.	**RM7**	Where traffic calming is identified, the Owner acknowledges and agrees to implement traffic calming measures on roads within the limits of their subdivision to limit vehicular speed and improve pedestrian safety. The Owner further acknowledges and agrees that the detailed design for new roads will include the recommendation(s) from the required supporting transportation studies. The Owner agrees that traffic calming measures shall reference best management practices from the Canadian Guide to Neighbourhood Traffic Calming, published by the Transportation Association of Canada, and/or Ontario Traffic Manual. These measures may include either vertical or horizontal features (such measures shall not interfere with stormwater management and overland flow routing), including but not limited to: • intersection or mid block narrowings, chicanes, medians; • speed humps, speed tables, raised intersections, raised pedestrian crossings; • road surface alterations (for example, use of pavers or other alternate materials, provided these are consistent with the City's Official Plan polices related to Design Priority Areas); • pavement markings/signage; and • temporary/seasonal installations such as flexi posts or removable bollards.	**OTTAWA Planning**
		<u>Highways/Roads</u>	
20.	**HR1**	The Owner acknowledges and agrees that all supporting transportation studies and design of all roads and intersections shall be to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
21.	**HR2**	The Owner shall retain a licensed or registered professional with expertise in the field of transportation planning and/or traffic operations to prepare a Transportation Impact Assessment. The study shall comply with the City of Ottawa's Transportation Impact Assessment Guidelines. The Owner agrees to revise the Draft Plan in accordance with the recommendations of the study.	**OTTAWA Planning**
22.	**HR6**	The Owner shall provide site triangles at the following locations on the final plan: • 5 by 5 metre site triangles at the intersection of Stereo Street and Mer Bleue Road	**OTTAWA Planning Legal**

23.	**HR7**	A 0.3 m reserve adjacent to the widened limit of *Mer Bleue Road* shall be indicated on the plan submitted for registration and conveyed at no cost to the City.	**OTTAWA Planning Legal**
24.	**HR9**	The Owner agrees to provide a construction traffic management plan for the subdivision prior to the earlier of registration of the Agreement or early servicing. Such plan shall be to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
25.	**HR11**	All streets shall be named to the satisfaction of the Director of Building Code Services and in accordance with the Municipal Addressing By-law or the Private Roadways By-law as applicable.	**OTTAWA Planning BCS**
26.	**HR12**	Where land has been dedicated for road widening purposes as part of the planning process, where the Owner receives no financial compensation or in-kind consideration in exchange for the widening, and where the City deems that the land is no longer required for that purpose, the lands may be conveyed back to the original Owner, or its successor in title, for $1.00. The Owner shall be responsible for all costs to complete said conveyance, including administrative fees, unless otherwise determined by the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
27.		The Owner agrees and acknowledges that they shall submit with their detailed design, Road cross sections that are acceptable to the City to the satisfaction of the General Manager, Planning, Infrastructure & Economic Development Department prior to approvals.	**OTTAWA Planning**
		<u>Geotechnical</u>	
28.		The Owner acknowledges and agrees that it shall retain the services of a geotechnical engineer, licensed in the Province of Ontario, to ensure that the recommendations of the Geotechnical Investigation Report (the "Report"), referenced in Schedule "E" herein, are fully implemented. The Owner further acknowledges and agrees that it shall provide the General Manager, Planning, Infrastructure and Economic Development Department with confirmation issued by the geotechnical engineer that the Owner has complied with all recommendations and provisions of the Report, prior to construction of the foundation and at the completion of the Works, which confirmation shall be to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
29.	**GT2**	The Owner shall submit a geotechnical report prepared in accordance with the City's Geotechnical Investigation and Reporting Guidelines and/or Slope Stability Guidelines for Development Applications by a geotechnical	**OTTAWA Planning**

		engineer or geoscientist, licensed in the Province of Ontario, containing detailed information on applicable geotechnical matters and recommendations to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development which include, but are not limited to: a) existing sub-surface soils, groundwater conditions; b) slope stability (including an assessment during seismic loading) and erosion protection, in addition to any building construction requirements adjacent to unstable slope; c) clearly indicate orientation of any cross-sections used in slope stability analysis and location of center of the slip circle; d) grade raise restrictions on the site and, if appropriate, the impacts this will have on the slope stability; e) design and construction of underground services to the building, including differential settlement near any buildings or structures; f) design and construction of roadway, fire routes and parking lots; g) design and construction of retaining walls and/or slope protection; h) design and construction of engineered fill; i) design and construction of building foundations; j) site dewatering; k) design and construction of swimming pools; l) design and construction of park blocks for its intended uses; and m) in areas of sensitive marine clay soils:	
30.	**GT4**	In areas of sensitive marine clay soils, the Owner agrees that, prior to registration, to prepare an information package for homeowners regarding tree planting and watering, in accordance with the supporting geotechnical report. This information must be approved by Forestry Services prior to circulation to homeowners.	**OTTAWA Forestry**
		<u>Pathways, Sidewalks, Walkways, Fencing, and Noise Barriers</u>	
31.	**S1**	The Owner acknowledges and agrees that all pathways, sidewalks, walkways, fencing, and noise barriers are to be designed and constructed in accordance with City specifications, at no cost to the City, and to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	
32.	**S3**	The Owner agrees to design and construct 1.8 metre wide sidewalks at the following locations: • South side of Stereo Street • East side of Broadcast Street from Stereo Street to Chromium Street • South side of Chromium Street from Broadcast Street to Mer Bleue Road.	**OTTAWA Planning**

33.	**S4**	The Owner agrees to design and construct, fully accessible, 2.0 metre wide walkways and related works through the length of the public lands at in the following locations: Within Blocks 31	**OTTAWA Planning**
34.	**S5**	The Owner agrees to connect all new pathways, sidewalks, walkways to the existing pathways, sidewalks, walkways located at the following locations: • Block 231 on Plan 4M-1613	**OTTAWA Planning**
35.	**S8**	a) The Owner agrees to design and construct 1.8 metre wood privacy fences in accordance with the Fence By-law at the following locations where privacy fences are not existed on the property line of adjacent developments • South side of Block 32 • South side of Blocks 1-4 where fences • East side of Blocks 4-11 b) The Owner agrees that any wood privacy fence required to be installed shall be located a minimum of 0.15 metres inside the property line of the private property.	**OTTAWA Planning**
36.	**S9**	a) The Owner agrees to design and erect at no cost to the City, noise attenuation barriers in accordance with City specifications at the following locations: • Blocks 1, 14, 22 and 23 b) The Owner agrees that any noise attenuation barrier required to be installed under this Agreement, shall be located a minimum of 0.30 metres inside the property line of the private property, and the location of the fence shall be verified by an Ontario Land Surveyor, prior to the release of securities for the noise attenuation barrier.	**OTTAWA Planning**
37.	**S10**	The Owner shall insert a clause in each agreement of purchase and sale and shall be registered as a notice on title in respect of all lands which fences have been constructed stating that: "Purchasers are advised that they must maintain all fences in good repair, including those as constructed by *Caivan Development Corp.* along the boundary of this land, to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department. The Purchaser agrees to include this clause in any future purchase and sale agreements".	**OTTAWA Planning**
		<u>Landscaping/Streetscaping</u>	

38.	**LS1**	The Owner agrees, prior to registration to have a landscape plan(s) for the plan of subdivision prepared by a Landscape Architect, in accordance with the recommendations contained in the geotechnical report(s), the Tree Conservation Report, and/or the Environmental Impact Statement (if appropriate). The landscape plan(s) shall include detailed planting locations, plant lists which include species, plant form and sizes, details of planting methods, pathway widths and materials, access points, fencing requirements and fencing materials, other landscape features and gateway features where required. The Owner agrees to implement the approved landscape plan(s) and bear all costs and responsibility for the preparation and implementation of the plan(s). The Owner agrees that where sensitive marine clay soils are present, and the geotechnical report has satisfied the applicable conditions of the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines, confirmation of adequate soil volumes in accordance with the subject guidelines shall be provided by a Landscape Architect prior to zoning approval. All of the aforementioned are to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning Forestry**
39.	**LS2**	The Owner agrees that for all single detached and semi-detached lots, a minimum of 1 tree per interior lot and 2 trees per exterior side yard lots (i.e. corner lots) shall be provided on the landscape plan(s). In areas of low/medium plasticity sensitive marine clay soils, the following exceptions in accordance with the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines will apply in order to maximize the number of medium size trees: a) Where abutting properties form a continuous greenspace between driveways, one medium size tree will be planted instead of two small size trees, provided the minimum soil volume can be achieved. In these cases only, for the purposes of determining the minimum number of trees to be planted, one medium size tree that replaces two small trees will be counted as two trees. b) The medium size tree should be planted as close as possible to the middle of this continuous greenspace (in the right-of-way) to maximize available soil volume. c) On larger lots with sufficient soil volume for a medium size tree, one medium size tree will be planted on each lot (or each side of a corner lot), even if the abutting properties form a continuous greenspace between driveways.	**OTTAWA Planning Forestry**

		d) If trees need to be replaced, Forestry staff reserve the right to plant appropriate size trees at one tree per lot. Along park frontages, the Landscape Plan shall locate trees at a 6-8 metre on-centre separation distance along the full extent of the road right-of-way abutting any park block(s). Should specific site constraints prevent the required allocation of trees, the remaining number of required trees shall be provided within any proposed park(s), open space or environmental blocks, non-residential road right-of-way frontages, stormwater management facility(s), or other suitable alternative locations, to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	
		Tree Conservation	
40.	**TC1**	The Owner acknowledges and agrees to abide by the Urban Tree Conservation By-law, 2009-200, and that any trees to be removed from the site shall be in accordance with an approved Tree Permit. The Owner agrees to implement the measures recommended in the supporting tree conservation report to ensure preservation of the trees identified for protection, in accordance with the City's tree protection requirements listed within the Urban Tree Conservation By-law, 2009-200. All of which are to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
41.	**TC3**	The Owner agrees to maintain the tree protection measures until construction is complete and/or the City has provided written permission to remove them.	**OTTAWA Planning**
		Parks	
42.	**P1**	In accordance with the *Planning Act* and the City of Ottawa Parkland Dedication By-law, the Owner shall provide cash-in-lieu of parkland on the subject lands within Ward 19- Cumberland such value of the land to be determined by the City's Realty Services Branch. The Applicant shall bear the cost of any appraisal costs incurred by the City; or all to the satisfaction of the General Manager, Recreation, Cultural and Facility Services Department.	**OTTAWA Parks**
43.	**P19**	The Owner covenants and agrees that the parkland dedication requirement has been calculated at a rate of one hectare per 500 units (residential >18units/ha), but for apartments, as defined by the zoning by-law this parkland conveyance will not exceed a maximum of 10% of the land area of the site being developed. Based on the estimated number of	**OTTAWA Planning Parks**

123 units for this subdivision for a parkland dedication requirement of 0.246 hectares. The amount of parkland required for the multi-residential Block 33 is 0.072 hectares based on 10% of the land area of the site being developed. The parkland dedication requirement are shown in the calculation below:

In the event that the number of units change, the required parkland dedication will also change.

Parkland Dedication Required:				
Residential Units:	123			Parkland Required (ha)
		Total:	Calculation	
Unit Sub-Totals:	123	**123**	1 / 500	0.246
Block 33	0.721 hectares		10% land area being developed	0.072
		Parkland REQUIRED Total *(ha)*:		**0.318**

44. P16 The Owner shall include a clause in each Agreement of Purchase and Sale and shall be registered as a notice on title in respect of all Lots and Blocks which shall provide notification to all purchasers of lands within the Subdivision that parkland within this subdivision and/or already existing in the vicinity of the subdivision may have:

a) active hard surface and soft surface recreational facilities
b) active lighted sports fields
c) recreation and leisure facilities
d) potential community centre
e) library
f) day care
g) other potential public buildings/facilities.

Environmental Constraints

45. **EC4** The Owner agrees to abide by all appropriate regulations associated with Provincial and Federal statutes for the protection of wildlife, including migratory birds and species at risk. **OTTAWA Planning**

Contaminated Soil

46. The Owner agrees and acknowledges that should buried materials such as refuse, concrete and asphalt or undesirable cobbles and materials be **OTTAWA Planning**

		excavated on site they shall be removed from the excavations and be removed off site as per the direction of the on-site geotechnical engineer.	
		Schools	
47.	**SC1**	The Owner be required to inform prospective purchasers that school accommodation pressures exist in the Ottawa-Carleton District School Board schools designated to serve this development which are currently being addressed by the utilization of portable classrooms and/or by directing students to schools outside their community.	**OCDSB**
		Stormwater Management	
48.	**SW1**	The Owner shall provide any and all stormwater reports (list of reports, for example, a Stormwater Site Management Plan in accordance with a Conceptual Stormwater Site Management Plan) that may be required by the City for approval prior to the commencement of any works in any phase of the Plan of Subdivision. Such reports shall be in accordance with any watershed or sub-watershed studies, conceptual stormwater reports, City or Provincial standards, specifications and guidelines. The reports shall include, but not be limited to, the provision of erosion and sedimentation control measures, implementation or phasing requirements of interim or permanent measures, and all stormwater monitoring and testing requirements. All reports and plans shall be to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning CA**
49.	**SW2**	(a) Prior to the commencement of construction of any phase of this Subdivision (roads, utilities, any off-site work, etc.) the Owner shall: i. have a Stormwater Management Plan and an Erosion and Sediment Control Plan prepared by a Professional Engineer in accordance with current best management practices: ii. (if appropriate) provide all digital models and modelling analysis in an acceptable format; iii. have said plans approved by the General Manager, Planning, Infrastructure and Economic Development Department, and iv. provide certification through a Professional Engineer licensed in the province of Ontario that the plans have been implemented. (b) All submissions and any changes made to the Plan shall be submitted to the satisfaction to the City and the South Nation Conservation Authority.	**OTTAWA Planning CA**

		(c) The Owner shall implement an inspection and monitoring plan to maintain erosion control measures.	
50.	**SW3**	On completion of all stormwater works, the Owner agrees to provide certification to the General Manager, Planning, Infrastructure and Economic Development Department through a Professional Engineer, licensed in the province of Ontario, that all measures have been implemented in conformity with the approved Stormwater Site Management Plan.	**OTTAWA Planning**
51.	**SW6**	The Owner agrees that the development of the Subdivision shall be undertaken in such a manner as to prevent any adverse effects, and to protect, enhance or restore any of the existing or natural environment, through the preparation of any storm water management reports, as required by the City.	**OTTAWA Planning**
52.	**SW7**	The Owner covenants and agrees that the following clause shall be incorporated into all agreements of purchase and sale for the whole, or any part, of a lot or block on the Plan of Subdivision, and registered separately against the title: "The Owner acknowledges that some of the rear yards within this subdivision are used for on-site storage of infrequent storm events. Pool installation and/or grading alterations and/or coach houses on some of the lots may not be permitted and/or revisions to the approved Subdivision Stormwater Management Plan Report may be required to study the possibility of modification on any individual lot. The Owner must obtain approval of the General Manager, Planning, Infrastructure and Economic Development Department of the City of Ottawa prior to undertaking any grading alterations."	**OTTAWA Legal**
53.	**SW8**	Where the Owner is required under this Agreement to provide the oversize and/or over-depth storm sewers or open drains in order to make provisions for later development of upstream lands not owned by the Owner herein, as referred to in the approved plans, the City will, insofar as it legally may, require that payment shall be made by the Owner of such upstream undeveloped land which will utilize the said storm sewers as an outlet(s), prior to registration. The amount of payment shall be determined by the General Manager, Planning, Infrastructure and Economic Development Department.	
54.		The Owner acknowledges and agrees that if temporary dewatering is required in excess of 50,000 litres per day on site for approved works that they shall apply to the MOECC for a dewatering activity discharge approval. Furthermore, all cost shall be borne by the Owner.	**OTTAWA Planning**

		Sanitary Services	
55.	**SS1**	The Owner agrees to submit detailed municipal servicing plans, prepared by a Professional Civil Engineer licensed in the Province of Ontario, to the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
56.	**SS3**	As the Owner proposes a road allowance(s) of less than 20 metres, and if the Owner also proposed boulevards between 4.0 and 5.0 metres wide, the Owner shall meet the following requirements: a) extend water, sanitary, and storm services a minimum of 2.0 metres onto private property during installation before being capped; b) install high voltage electrical cable through the transformer foundations to maintain adequate clearance from the gas main; c) provide and install conduits as required by each utility; d) provide and install transformer security walls when a 3.0 metres clearance, as required by the Electrical Code, cannot be maintained. The design and location of the security wall must be approved by the local hydro utility; and e) install all road-crossing ducts at a depth not to exceed 1.2 metres from top of duct to final grade.	**OTTAWA Planning**
		Water Services	
57.	**W1**	The Owner agrees to design and construct all necessary watermains and the details of water servicing and metering for the lots abutting the watermains within the subject lands. The Owner shall pay all related costs, including the cost of connection, inspection and sterilization by City personnel, as well as the supply and installation of water meters by the City.	**OTTAWA Planning**
58.	**W2**	The Owner shall prepare, at its cost, a hydraulic network analysis of the proposed water plant within the Plan of Subdivision and as it relates to the existing infrastructure. This analysis shall be submitted for review and approval as part of the water plant design submission.	**OTTAWA Planning**
59.	**W3**	The Owner acknowledges and agrees not to permit any occupancy of buildings on the individual Lots described in Schedule "A" until the water plant has been installed, sterilized and placed in service to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
60.	**W4**	The Owner further acknowledges and agrees that the service post, which is the fitting located near the property line that allows access to the shutoff	**OTTAWA Planning**

		valve, must be visible, raised to finished grade and in working condition in order for the City to turn on the service.	
61.	**W6**	The Owner acknowledges and agrees not to apply for, nor shall the City issue, building permits for more than 50 dwelling units (or the equivalent) where the watermain for such units is not looped. Any unit serviced by a looped watermain that is not looped shall be required to have sufficient fire protection, to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
62.		The Owner acknowledges and agrees to service each residential development lot within the subdivision to the property line to the satisfaction of the General Manager, Planning and Growth Management.	**OTTAWA Planning**
		Serviced Lands	
63.	**SL1**	The Owner shall be responsible for the provisions of the following works, including oversizing and over depth (where appropriate), at its cost, in accordance with plans approved by the General Manager, Planning, Infrastructure and Economic Development Department, and/or the Province: a. Watermains; b. Sanitary Sewers; c. Storm Sewers; d. Roads and traffic plant(s); e. Street Lights; f. Sidewalks; g. Landscaping; h. Street name, municipal numbering, and traffic signs; and i. Grade Control and Drainage.	**OTTAWA Planning**
64.	**SL2**	The Owner shall not commence construction of any Works or cause or permit the commencement of any Works until the City issues a Commence Work Notification, and only then in accordance with the conditions contained therein.	**OTTAWA Planning**
65.	**SL4**	The Owner shall not be entitled to a building permit, early servicing, or commencement of work construction until they can demonstrate that there is adequate road, sanitary, storm, and watermain capacity and any Environmental Compliance Approvals (ECA) necessary are approved. All are to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
		Utilities	

66.	**U1**	The Owner is hereby advised that prior to commencing any work within the subdivision, the Owner must confirm that sufficient wire-line communication /telecommunication infrastructure is currently available to the proposed development to provide communication/telecommunication service to the proposed development. In the event that such infrastructure is not available, the Owner is hereby advised that the Owner shall ensure, at no cost to the City, the connection to and/or extension of the existing communication / telecommunication infrastructure. The Owner shall be required to demonstrate to the municipality that sufficient communication /telecommunication infrastructure facilities are available within the proposed development to enable, at a minimum, the effective delivery of communication /telecommunication for emergency management services (i.e. 911 Emergency Services).	**OTTAWA Planning**
67.		That the owner shall transfer such new easements and maintenance agreements as are deemed necessary by Rogers Communications Canada Inc. to service this subdivision, to our satisfaction and that of the appropriate authority and at no cost to us. The owner is also to ensure that these easement documents are registered on title immediately following registration of the final plan, and the affected agencies duly notified	**Rogers**
68.		That the application be required, in the Subdivision Agreement, to coordinate the preparation of an overall utility distribution plan. This plan would be showing the locations (shared or otherwise) and the installation timing and phasing of all required utilities (on-ground, below ground) through liaison with the appropriate electrical, gas, water, telephone and cablevision authority. This includes on-site drainage facilities. Such location plan being to the satisfaction of all affected authorities.	**Rogers**
69.		That the owner agrees with Rogers Communications Canada Inc. to arrange for and pay the cost of the relocation of any existing services which is made necessary because of this subdivision, to the satisfaction of the authority having jurisdiction.	**Rogers**
70.		The Owner acknowledges and agrees that any relocation of existing Enbridge Gas Distribution infrastructure as a result of changes in the alignment or grade of future road allowances or for temporary gas pipe installations pertaining to phase construction, will be at their cost.	**Enbridge**
71.		The Owner acknowledges and agrees to provide Enbridge Gas Distribution any easement(s) required to service this development and any future adjacent developments. The Owner will provide such easements at no cost to Enbridge Gas Distribution. The inhibiting order will not be lifted until such time as the Owner has met all of Enbridge Gas Distribution's requirements	**Enbridge**

72.		The Owner agrees to contact Enbridge Gas Distribution for service and meter installation details and to ensure all gas piping is installed prior to the commencement of site landscaping (including, but not limited to, tree planting, silva cells, and/or soil trenches) and/or asphalt paving.	**Enbridge**
73.		The Owner agrees that in the event that a pressure reducing regulator is required, they shall provide a 3 metre by 3 metre exclusive use location that cannot project into the municipal road allowance. The final size and location of the regulator station will be confirmed by Enbridge Gas Distribution.	**Enbridge**
74.		The Owner acknowledges and agrees to grade all road allowances to as close to final elevation as possible, provide necessary field survey information and all approved municipal road cross sections, identifying all utility locations prior to the installation of the gas piping.	**Enbridge**
75.		The Owner acknowledges and agrees that it will grant to Bell Canada any easements that may be required, which may include a blanket easement, for communication/telecommunication infrastructure. In the event of any conflict with existing Bell Canada facilities or easements, the Owner shall be responsible for the relocation of such facilities or easements.	**Bell**
76.		The Owner shall ensure that any landscaping or surface finishing does not encroach into existing or proposed Hydro One's overhead or underground assets or easement. When proposing to place plantings in proximity of existing power lines, the Owner shall refer to Hydro One's guidelines "Planting Under or Around Powerlines & Electrical Equipment". The shrub or tree location and expected growth must be considered. If any Hydro One related activity requires the trimming, cutting or removal of vegetation, or removal of other landscaping or surface finishing, the activity and the reinstatement shall be at the Owner's expense.	**Hydro One**
77.		The Owner is advised that there are high voltage overhead lines along Mer Bleue Road. The Owner shall ensure that the minimum building setback from the property limit will be 4.8 metres in accordance with Electrical Safety Authority (ESA) and Hydro One regulations.	**Hydro One**
78.		The Owner acknowledges and agrees that prior to commencing Works identified within the Draft Plan; it shall confirm the proposed development is sufficiently serviced by all necessary utilities. The Owner further agrees to comply with all relevant and existing utility Conditions of Service, construction processes and guidelines. The Owner further agrees it shall be responsible for engaging the providers of any necessary utilities to determine servicing for the proposed development and that it shall be responsible for all costs relating to the relocation, placement and/or	**Hydro One**

		upgrade of existing or future utility infrastructure for the proposed development. The Owner shall be required to demonstrate to the satisfaction of the General Manager, Planning, Infrastructure and Economic Development that sufficient utility servicing and infrastructure exist to service the proposed development and that communication / telecommunication infrastructure facilities are available, at a minimum, for the delivery of emergency management services. The Owner acknowledges and agrees to convey, at their cost, any easements as may be required by the necessary utilities and agrees to abide by all conditions of the City's inhibiting order. The Owner further acknowledges and agrees that such easements shall not be granted on any lands being conveyed to the City, or those proposed to be conveyed to the City. Should any lands owned or proposed to be owned by the City be encumbered as a result of these conditions, the Owner shall bear the sole responsibility and costs associated with correcting such actions, including but not limited to the conveyance of additional lands, the relocation of any such easements or infrastructure as may be deemed appropriate by the General Manager, Planning, Infrastructure and Economic Development.	
79.		The Owner acknowledges and agrees that Canada Post will provide mail delivery service to the subdivision through centralized Community Mail Boxes (CMB's). The CMB's location will be determined at the time of the preliminary Composite Utility Plan. If the development includes plans for (a) multi-unit building(s) with a common indoor entrance, the Owner must supply, install and maintain the mail delivery equipment with parcels compartments within these buildings to Canada Post's specifications (LBA). Please provide Canada Post with notification of the new civic addresses once available and with the excavation date for the first phase construction as well as the date development work is scheduled to begin and the expected installation date(s) for the CMB(s).	**Canada Post**
80.		The Owner acknowledges and agrees to consult with Canada Post to determine suitable permanent locations for the Community Mailboxes and indicate these locations on the appropriate servicing plans.	**Canada Post**
81.		The Owner agrees, prior to offering any units for sale, to display a map on the wall of the sales office in a place readily accessible to potential homeowners that indicates the location of all Community Mail Boxes within the development, as approved by Canada Post	**Canada Post**
82.		The Owner agrees to include in all offers of purchase and sale a statement which advises the purchaser that mail will be delivered via Community Mail	**Canada Post**

		Canada Post Boxes. The Owner also agrees to note the locations of all Community Mail Boxes within the development, and to notify affected homeowners of any established easements granted to Canada Post to permit access to the Community Mailbox	
83.		The Owner agrees to provide a suitable and safe temporary site for a Community Mail Box until curbs, sidewalks and final grading are completed at the permanent Community Mail Box locations. Canada Post will provide mail delivery to new residents as soon as the homes are occupied.	**Canada Post**
84.		The Owner agrees to provide the following for each Community Mailbox site and to include these requirements on the appropriate servicing plans: - Any required walkway across the boulevard, per municipal standards. - Any required curb depressions for wheelchair access, with an opening of at leas	**Canada Post**
		Fire Services	
85.	**FUS1**	The Owner acknowledges and agrees that if two-hour firewalls, active fire protection measures such as sprinkler systems, and/or minimum building separations are required to comply with the FUS calculation as per the City Design Guidelines for water distribution systems, the Owner shall note any such requirements on the grading plan. The Owner shall, prior to registration, provide certified plans demonstrating the locations of such oversized services and/or oversized plumbing to compensate for low peak hour pressures in the local water distribution system. All are to the satisfaction of the General Manager of Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
86.	**FUS2**	The Owner acknowledges and agrees that measures which include, but are not limited to, active fire protection measures such as sprinkler systems, two-hour firewalls that compartmentalize the structure into separate fire areas, and oversized services and/or oversized plumbing shall require the posting of securities to guarantee their installation, prior to registration. The securities will be released upon receiving a letter signed and sealed by a Professional Engineer licensed in the Province of Ontario certifying that construction was carried out in accordance with the approved drawing(s)/plan(s). All are to the satisfaction of the General Manager of Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
87.	**FUS3**	The Owner shall insert a clause in each agreement of purchase and sale as applicable and shall be registered as a notice on title in respect of all Lots and Blocks wherein the dwelling contains, or intends to contain, a sprinkler system as follows:	**OTTAWA Planning**

		"Purchasers are advised that they must maintain the sprinkler system in working order to the satisfaction of the City's Fire Department. The Purchaser agrees to include this clause in any future purchase and sale agreements."	
88.	**FUS4**	The Owner acknowledges and agrees that it shall, in the case of insufficient fire flow availability or excessive water age and loss of water disinfectant residual, provide active fire protection options such as sprinkler systems, two-hour firewalls or fire breaks that compartmentalize the structures into separate fire areas, as may be required, to limit the sizing of crescent, dead-end, and other distribution mains to a nominal size of no more that 200mm. All are to be determined by and to the satisfaction of the General Manager of Planning, Infrastructure and Economic Development Department.	**OTTAWA Planning**
89.		The Owner shall not demand of the City to issue, nor shall anyone claiming title from it or under its authority, demand of the City to issue, one or building permits to construct any building or other structure on any lots or block in the Subdivision until firebreak lots are designated to the satisfaction of the City's Fire Chief.	**OTTAWA Fire**
		Noise Attenuation	
90.	**N1**	The Owner shall have a Noise Study undertaken related to noise assessment and land use planning with respect to noises generated by moving and stationary sources prepared by a Professional Engineer, licensed in the province of Ontario to the satisfaction and approval of the General Manager, Planning, Infrastructure and Economic Development Department. The Study shall comply with: i. the City of Ottawa's Environmental Noise Control Guidelines, as amended; and ii. address, and be in accordance with, the current version of the Association of Professional Engineers of Ontario Guidelines for Professional Engineers providing Acoustical Engineering Services in Land Use Planning. The study shall provide all specific details on the methods and measures required to attenuate any noise that exceeds the allowable noise limits in locations as determined by the recommendations of the Noise Assessment Study.	**OTTAWA Planning**
91.	**N2**	Where structural mitigation measures are required as a result of the Noise Assessment Study, the Owner shall provide, prior to final building inspection, certification to the General Manager, Planning, Infrastructure and Economic Development Department, through a Professional Engineer,	**OTTAWA Planning**

		that the noise control measures have been implemented in accordance with the approved study.	
92.	**N4**	The Owner agrees that all purchase and sale agreements for the whole or any part of the lot/block on the Plan of Subdivision shall contain the following clauses that shall be registered as a notice on title in respect of all Lots and Blocks: Warning Clause Type A: "Transferees are advised that sound levels due to increasing road traffic may occasionally interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment's noise criteria."	**OTTAWA Planning Legal**
		Warning Clause Type B: "Transferees are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road traffic may on occasions interfere with some activities of the dwelling occupants as the sound levels exceed the City's and the Ministry of the Environment's noise criteria." Warning Clause Type C: "This dwelling unit has been fitted with a forced air heating system and the ducting, etc. was sized to accommodate central air conditioning. Installation of central air conditioning by the occupant will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria. (Note: The location and installation of the outdoor air conditioning device should comply with the noise criteria of MOE Publication NPC-216, Residential Air Conditioning Devices and thus minimize the noise impacts both on and in the immediate vicinity of the subject property.)" Warning Clause Type D "This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the City's and the Ministry of the Environment's noise criteria." **Land Transfers**	
93.	**LT1**	The Owner shall convey, at no cost to the City, all lands required for public purposes, including but not limited to, reserves, road widenings, daylighting triangles, walkway blocks, open space blocks, and lands required for parks (or cash-in-lieu thereof) and for stormwater	**OTTAWA Planning Legal**

		management. In particular, the Owner agrees to convey the following lands: i. Pathway, Walkway or Servicing Blocks – Block 31 ii. 0.3 m Reserve Blocks – Blocks 33,34 iii. Daylighting Triangles – 5x5m from Arterial Rd to Local Rd and 3x3m Local Rd to Local Rd	
94.	**LT2**	The Owner agrees to convey, at no cost to the City, any easements that may be required for the provision of water and wastewater systems, in addition to underground or overland stormwater drainage systems.	**OTTAWA Planning Legal**
		Blasting	
95.	**B1**	The Owner agree that all blasting activities will conform to the City of Ottawa's standard S.P. No: F-1201 Use of Explosives. Prior to any blasting activities, a pre-blast survey shall be prepared as per F-1201, at the Owner expense for all buildings, utilities, structures, water wells, and facilities likely to be affected by the blast and those within 75 m of the location where explosives are to be used. The standard inspection procedure shall include the provision of an explanatory letter to the owner or occupant and owner with a formal request for permission to carry out an inspection. The Owner agree to provide a Notification Letter in compliance with City specification F-1201. Specification indicates that a minimum of 15 Business days prior to blasting the Contractor shall provide written notice to all owner(s) and tenants of buildings or facilities within a minimum of 150m of the blasting location. The Owner agrees to submit a copy of the Notification Letter to the City.	**OTTAWA Planning**
		Development Charges By-law	
96.	**DC2**	The Owner shall inform the purchaser after registration of each lot or block of the development charges that have been paid or which are still applicable to the lot or block. The applicable development charges shall be as stated as of the time of the conveyance of the relevant lot or block and the statement shall be provided at the time of the conveyance. The statement of the Owner of the applicable development charges shall also contain the statement that the development charges are subject to changes in accordance with the *Development Charges Act, 1997* and the *Education Development Charges Act.*	**OTTAWA Planning Legal**
97.	**DC4**	The Owner acknowledges that for building permits issued after January 15, 2010, payment of non-residential development charges, excluding development charges for institutional developments, may be calculated in two installments at the option of the Owner, such option to be exercised by	**OTTAWA Planning Legal**

		the Owner at the time of the application for the building permit. The non-discounted portion of the development charge shall be paid at the time of issuance of the building permit and the discounted portion of the development charge shall be payable a maximum of two years from the date of issuance of the initial building permit subject to the following conditions: a) a written acknowledgement from the Owner of the obligation to pay the discounted portion of the development charges; b) no reduction in the Letter of Credit below the amount of the outstanding discounted development charges; and c) indexing of the development charges in accordance with the provisions of the Development Charges By-law. The Owner further acknowledges that Council may terminate the eligibility for this two-stage payment at any time without notice, including for the lands subject to this agreement and including for a building permit for which an application has been filed but not yet issued. For the purposes of this provision, "discounted portion" means the costs of eligible services, except fire, police and engineered services that are subject to 90% cost recovery of growth-related net capital costs for purposes of funding from development charges. The 10% discounted portion, for applicable services, must be financed from non-development charge revenue sources. "Non-discounted portion" means the costs of eligible services, fire, police and engineered services, that are subject to 100% cost recovery of growth-related net capital costs for purposes of funding from development charges.	
98.		The Owner agrees and acknowledges paying the development charges for their site for the works associated with Outer Greenbelt Development prior to registration of a plan of subdivision or upon the issuance of the first conditional building permit, whichever comes first. (City Council approved July 14, 2004 Motion 16/5). The Owner also agrees and acknowledges paying the development charges for their site for N5 and Channelization and Millennial Park prior to building permits.	**OTTAWA Planning**
		Survey Requirements	
99.	**Surv1**	The Owner shall provide the final plan intended for registration in a digital format that is compatible with the City's computerized system.	**OTTAWA Planning**
100.	**Surv2**	The Plan of Subdivision shall be referenced to the Horizontal Control Network in accordance with the City requirements and guidelines for referencing legal surveys.	**OTTAWA Surveys**

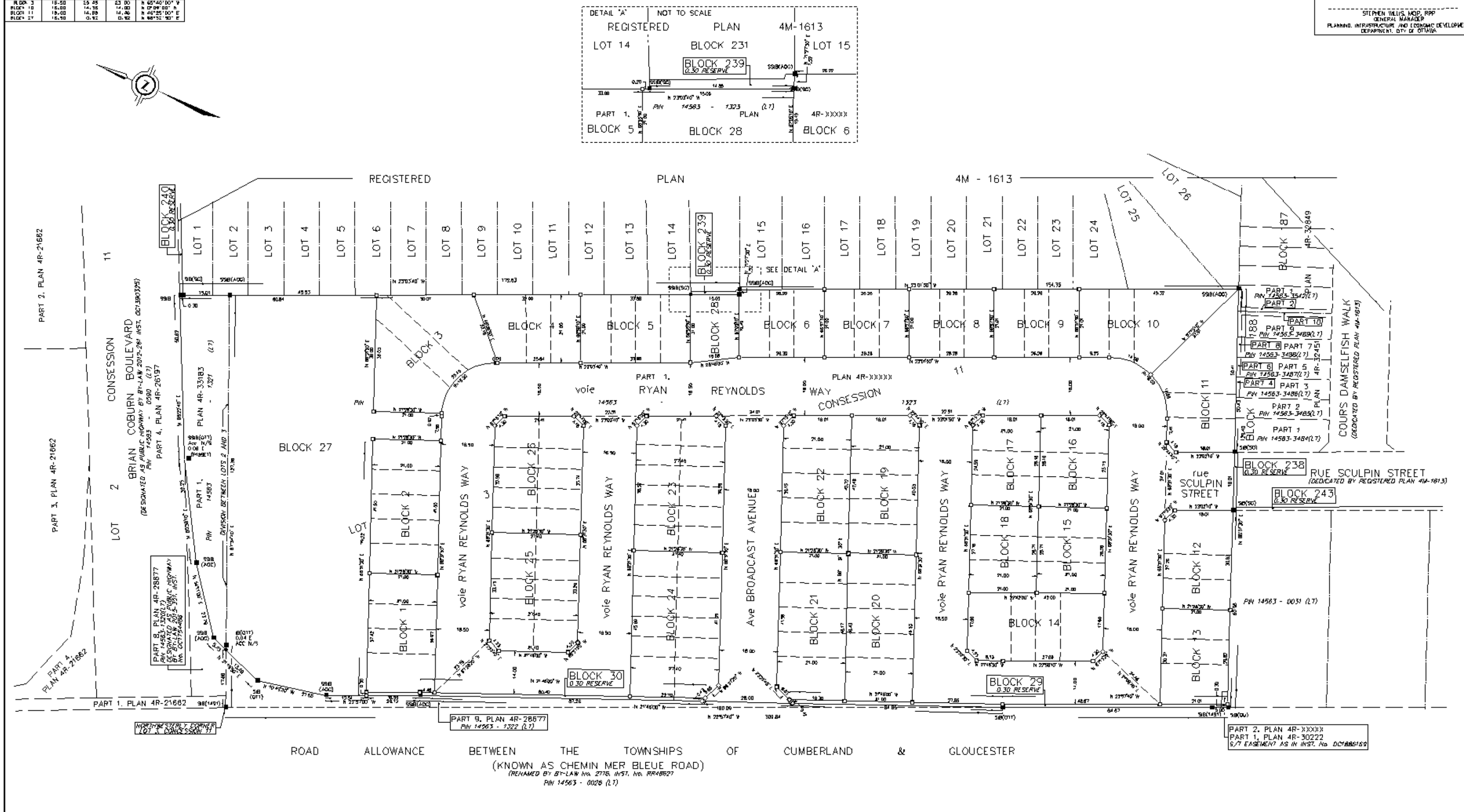
101.	**Surv3**	The distance from the travelled Centreline of all existing adjacent roads to the subdivision boundary should be set out in the Plan of Subdivision.	**OTTAWA Surveys**
		Closing Conditions	
102.	**C1**	The City Subdivision Agreement shall state that the conditions run with the land and are binding on the Owner's, heirs, successors and assigns.	**OTTAWA Legal**
103.	**C2**	At any time prior to final approval of this plan for registration, the City may, in accordance with Section 51 (44) of the *Planning Act*, amend, delete or add to the conditions and this may include the need for amended or new studies.	**OTTAWA Legal**
104.	**C3**	The owner shall pay any outstanding taxes owing to the City of Ottawa prior to registration.	**OTTAWA Planning Revenue**
105.	**C4**	Prior to registration of the Plan of Subdivision, the City is to be satisfied that conditions 1 to 107 have been fulfilled.	**OTTAWA Planning**
106.	**C5**	The Owner covenants and agrees that should damage be caused to any of the Works in this Subdivision by any action or lack of any action whatsoever on its part, the General Manager, Planning, Infrastructure and Economic Development Department may serve notice to the Owner to have the damage repaired and if such notification is without effect for a period of two full days after such notice, the General Manager, Planning, Infrastructure and Economic Development Department may cause the damage to be repaired and shall recover the costs of the repair plus the Management Fee under Section 427, of the *Municipal Act*, *2001*, like manner as municipal taxes.	**OTTAWA Planning**
107.	**C6**	If the Plan(s) of Subdivision, including all phases within the draft approved plan of subdivision, has not been registered by *(a date at least three years after the date of draft approval will be inserted later)*, the draft approval shall lapse pursuant to Section 51 (32) of the *Planning Act*. Extensions may only be granted under the provisions of Section 51 (33) of said *Planning Act* prior to the lapsing date.	**OTTAWA Planning**

[i] For Clearing Agencies:
"Planning" refers to Planning Services.
"LG" refers to applicable landowners group, such as Kanata North (KNLG), Kanata West (KWLG), Fernbank (FLG), East Urban (EULG), Manotick SDA (MLG), and Barrhaven South (BSLG).
"CA" refers to applicable conservation authorities, including RVCA, MVCA, and SNCA.
"Legal" refers to Legal Services.
"Parks" refers to Parks and Facilities Planning Services.
"BCS" refers to Building Code Services.
"Transit" refers to Transit Planning.
"Transpo Plg" refers to Transportation Planning.
"Forestry" refers to Forest Management.
"MTCS" refers to the Ministry of Tourism, Culture and Sport.
"Revenue" refers to Revenue Services.
"Surveys" refers to Surveys & Mapping/City Surveyor.

CURVE TABLE				
LOT/BLOCK	RADIUS	ARC	CHORD	BEARING
BLOCK 3	16.50	25.45	23.00	N 65°40'00" W
BLOCK 10	16.00	14.36	14.00	N 0°09'00" N
BLOCK 11	16.00	14.88	14.46	N 46°25'00" E
BLOCK 27	16.50	0.92	0.92	N 88°32'50" E

APPROVED UNDER SECTION 51 OF THE PLANNING ACT BY THE CITY OF OTTAWA THIS ___ DAY OF _______ 2022

STEPHEN WILLIS, MCIP, RPP
GENERAL MANAGER
PLANNING, INFRASTRUCTURE AND ECONOMIC DEVELOPMENT DEPARTMENT, CITY OF OTTAWA



PLAN 4M-

I CERTIFY THAT THIS PLAN IS REGISTERED IN THE LAND REGISTRY OFFICE FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON (No. 4) AT _________ O'CLOCK ON THE _____ DAY OF ___________, 2022 AND ENTERED IN THE PARCEL REGISTER FOR PROPERTY IDENTIFIER _______________

AND THE REQUIRED CONSENTS ARE REGISTERED AS PLAN DOCUMENT No. ________________________

____
LAND REGISTRAR

THIS PLAN COMPRISES ALL OF PINS 14563-1321(LT) AND 14563-1323(LT)

PLAN OF SUBDIVISION OF PART OF LOTS 2 AND 3 CONCESSION 11 (GEOGRAPHIC TOWNSHIP OF CUMBERLAND) NOW IN THE CITY OF OTTAWA

SCALE 1 : 500

J.D. BARNES LIMITED

METRIC DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

OWNER'S CERTIFICATE - PLAN OF SUBDIVISION

THIS IS TO CERTIFY THAT:

1. BLOCKS 1 TO 28 BOTH INCLUSIVE, THE STREETS NAMELY: Rue SCULPIN STREET, avenue BROADCAST AVENUE, AND voie RYAN REYNOLDS WAY, AND THE 0.30m RESERVES NAMELY BLOCKS 29 TO 30 BOTH INCLUSIVE, HAVE BEEN LAID OUT IN ACCORDANCE WITH OUR INSTRUCTIONS.
2. THE STREETS ARE HEREBY DEDICATED TO THE CITY OF OTTAWA AS PUBLIC HIGHWAYS.

DATED THIS ________ DAY OF _________ 202_

Coivon (Mer Bleue) Inc.

____
FRANK CAIRO
(PRESIDENT)
"I HAVE THE AUTHORITY TO BIND THE CORPORATION"

NOTES

BEARINGS ARE XTM GRID, DERIVED FROM SPECIFIED CONTROL POINTS (SCPs) XXXXXXXXXX AND XXXXXXXXXX, XTM ZONE XX, NAD83 (ORIGINAL)

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999967.

INTEGRATION DATA		
SPECIFIED CONTROL POINTS (SCPs): MTM ZONE 09, NAD83 (ORIGINAL)		
COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF O.REG 216/10.		
POINT ID	EASTING	NORTHING
SCP XXXXXXXXXX	XXX XXX XX	4 XXX XXX XX
SCP XXXXXXXXXX	XXX XXX XX	4 XXX XXX XX
COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.		

THE RESULTANT TIE BETWEEN SCP(A) AND SCP(B) IS XXX.XX N XX°XX'XX" E

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
PB	DENOTES	PLASTIC BAR
WIT	DENOTES	WITNESS
MEAS	DENOTES	MEASURED
JDB	DENOTES	J.D. BARNES LIMITED
AOG	DENOTES	ANNIS, O'SULLIVAN, VOLLEBEKK LTD
SG	DENOTES	STANTEC GEOMATICS
OTT	DENOTES	CITY OF OTTAWA
1491	DENOTES	D. DUTRISAC, O.L.S.

ALL SET SSIB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91

SURVEY MONUMENTS PLANTED ARE IRON BARS UNLESS OTHERWISE NOTED.
DISTANCES SHOWN ON CURVED LIMITS ARE ARC MEASUREMENTS.
SURVEY MONUMENTS FOUND ARE J.D. BARNES LIMITED UNLESS OTHERWISE NOTED.
RESERVE BLOCKS EXAGGERATED FOR CLARITY

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON 202 .

_____________ DATE

_______________________ C.W. FOX ONTARIO LAND SURVEYOR

J.D.BARNES LIMITED
LAND INFORMATION SPECIALISTS

DRAWN BY: CC	CHECKED BY: CF	REFERENCE NO.: 20-10-178-00 V5.0
PLOTTED: 3/15/22		DATED: 03/15/22

FILE: G:\20-10-178-00\v5\20-10-178_M-PlanV5.0.dgn


MC[2028] H(11)
MC[1812]
CM15[2156]
R3YY[2164]
R3YY[2778]
R3YY[2775]
SUBJECT SITE
2275 Mer-Bleue Road
R3YY[2115]
DR

120 Iber Road
Unit 103
Stittsville, Ontario K2S 1E9
Tel (613) 836-0856
Fax (613) 836-7183
www.DSEL.ca

CASSETTE SUBDIVISION – 2275 MER-BLEUE ROAD

MECP APPLICATION FOR APPROVAL OF SANITARY AND STORM SEWERS

OPERATING AUTHORITY

CITY OF OTTAWA
110 LAURIER AVENUE, WEST
OTTAWA, ONTARIO
K1P 1J1
TEL: (613) 580-2424
FAX: (613) 580-2495

©DSEL

120 Iber Road
Unit 103
Stittsville, Ontario K2S 1E9
Tel (613) 836-0856
Fax (613) 836-7183
www.DSEL.ca

CASSETTE SUBDIVISION – 2275 MER-BLEUE ROAD

MECP APPLICATION FOR APPROVAL OF SANITARY AND STORM SEWERS

OPERATING AUTHORITY

CITY OF OTTAWA
110 LAURIER AVENUE, WEST
OTTAWA, ONTARIO
K1P 1J1
TEL: (613) 580-2424
FAX: (613) 580-2495

©DSEL

Ministry of the Environment and Climate Change

Environmental Approvals Access and Service Integration Branch

135 St. Clair Avenue West
1st Floor
Toronto ON M4V 1P5
Tel.: 416 314-8001
Fax: 416 314-8452

Ministère de l'Environnement et de l'Action en matière de changement climatique

Direction de l'accès aux autorisations environnementales et de l'intégration des services

135, avenue St. Clair Ouest
Rez-de-chaussée
Toronto ON M4V 1P5
Tél : 416 314-8001
Téléc. : 416 314-8452

Ontario

QUESTIONNAIRE REGARDING ENVIRONMENTAL BILL OF RIGHTS (EBR) REQUIREMENTS - EQUIVALENT PUBLIC PARTICIPATION

This needs to be completed and sent back within 2 weeks of the date of the acknowledgement letter.

In Section 3.1 of the ECA application, you have indicated that the proposal is a prescribed instrument under the EBR. You then indicated "Yes" to the question "Is this proposal exempted from the EBR requirements?" and checked the circle indicating "This proposal has been considered in a substantially equivalent process of public participation (EBR, 1993, s.30)." To provide verification that the public participation process was substantially equivalent to that of an EBR Posting, please answer the following questions and send this questionnaire back.

1. Was the public participation process carried out in fulfillment of the requirements related to an approval under the Planning Act? ◉ Yes ◯ No If No, under which Act did the public participation process occur under? _____ *Please proceed to Question 3.*

2. If yes to No. 1, was the Planning Act approval related to a plan of subdivision? ◉ Yes ◯ No
   If yes to No. 2, no EBR Posting is required as plans of subdivisions are deemed to have met a substantially equivalent public participation process. If no, please proceed to Question 3.

3. If No for Question 1 or No to Question 2, please answer each of the following questions:
   a. Was a public meeting held at which any interested stakeholder could make oral submissions on the proposal and could stakeholders provide written submissions? ◯ Yes ◯ No
   b. Was notice of the public meeting and opportunity to provide written submissions provided by each of: direct notice to landowners within 120 metres of the property; by notice in a newspaper with general circulation in the area; and by posting a sign on the property? ◯ Yes ◯ No
   c. Did one or more of: the notice, the public meeting, or staff reports made available for public review discuss the significant environmental aspects of the project subject to this Environmental Compliance Approval application? ◯ Yes ◯ No

   If yes to <u>each</u> of a, b and c the s.30 EBR exception applies and no EBR Posting is required.

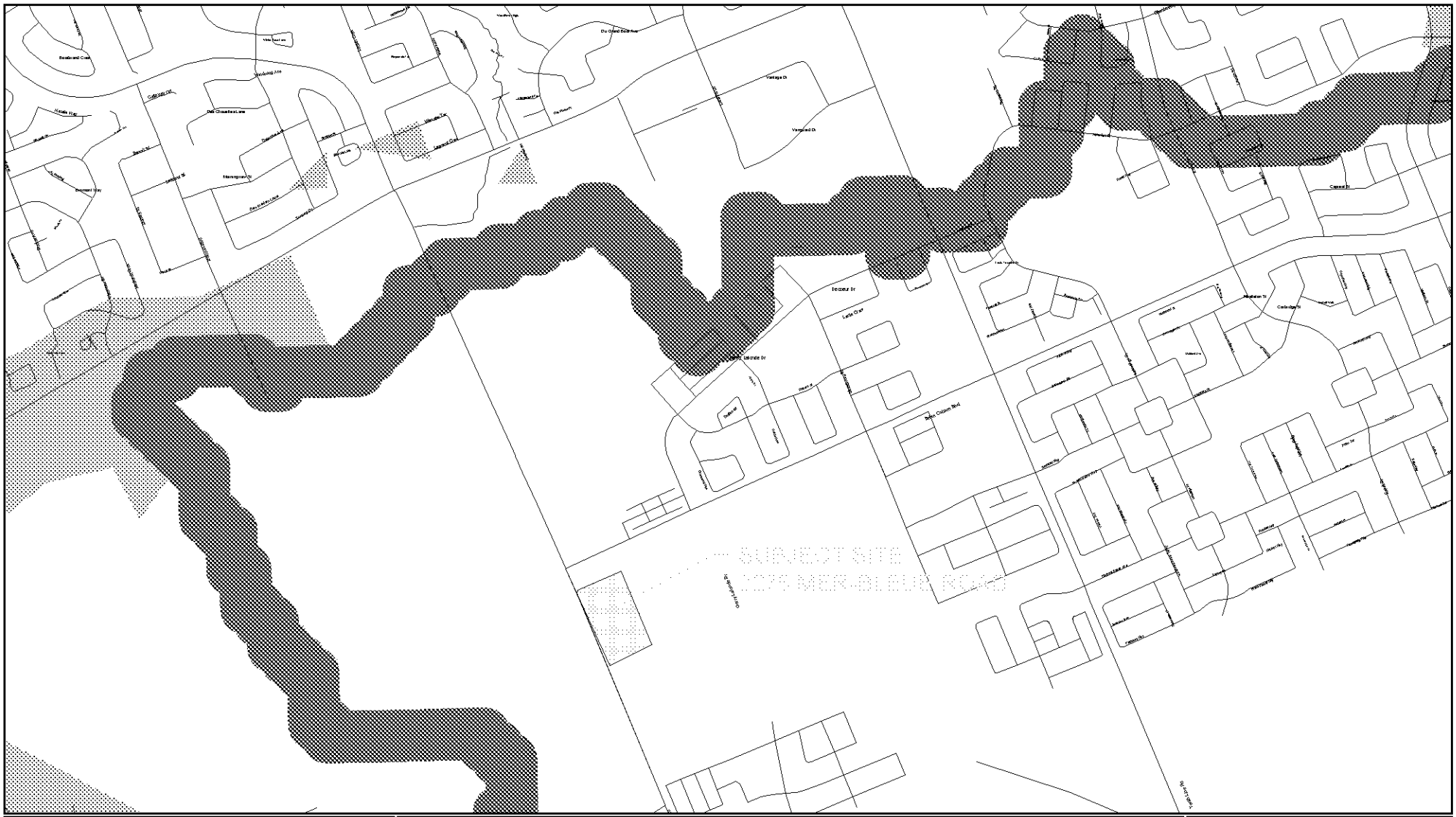
Cassette Subdivision (2275 Mer-Bleue Road)
Project Name

DSEL File No. 1214
Application Reference No.

Signature of Agent Completing

Kevin L. Murphy, P.Eng.
Print Name and Title

June 29, 2022
Date



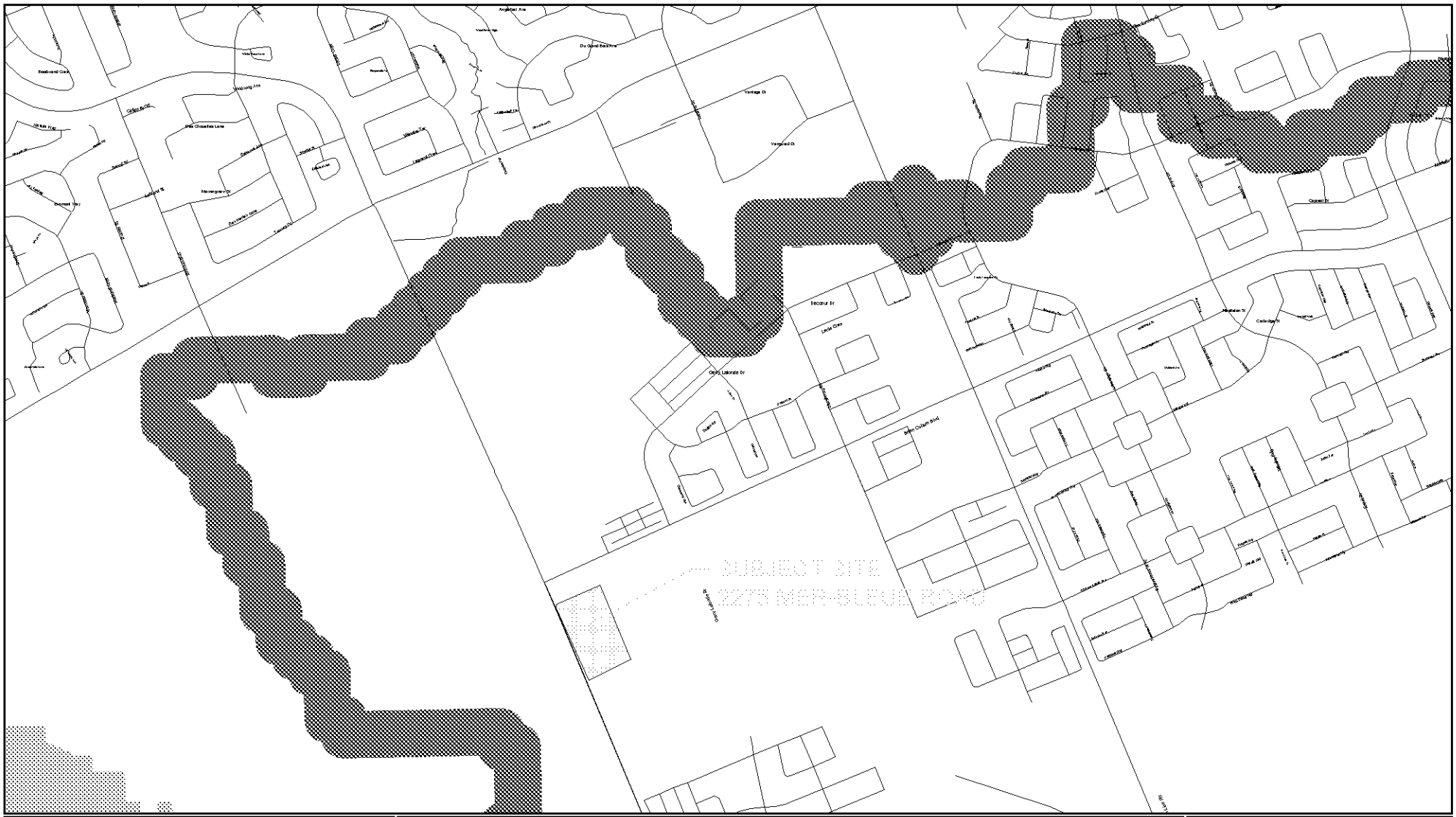
david schaeffer engineering ltd
SMART SUBDIVISIONS™

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

Highly Vulnerable Aquifers

PROJECT No.:	1214
SCALE:	N.T.S.
DATE:	JUNE 2022
FIGURE:	HVA

z:\projects\20-1214_caivan_2275_mer_bleue_rd\a_project-mgmt\a9_applications & approvals\a9.3_mecp\20220629_eca application\sourcewater protection\cad\city of ottawa highly vulnerable aquifer.dwg



david schaeffer engineering ltd
SMART SUBDIVISIONS™

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
TEL: (613) 836-0856
FAX: (613) 836-7183
www.DSEL.ca

Significant Groundwater Recharge Areas

PROJECT No.:	1214
SCALE:	N.T.S.
DATE:	JUNE 2022
FIGURE:	SGRA

z:\projects\20-1214_caivan_2275_mer_bleue_rd\a_project-mgmt\a9_applications & approvals\a9.3_mecp\20220629_eca application\sourcewater protection\cad\city of ottawa significant groundwater recharge.dwg

Conservation Partners
Partenaires en conservation

Mississippi Valley Conservation Authority | Rideau Valley Conservation Authority | South Nation Conservation / De la Nation Sud

February 24, 2021
File: SNC-1644-2021
ROLL No: 061450030137800

Mr. Steve Belan
City of Ottawa
110 Laurier Avenue West
K1P 1J1

Subject: **Application for Zoning By-law Amendment and Plan of Subdivision**
D02-02-21-0002, D07-16-21-0001
2275 Mer Bleue Road
Lot 3, Concession 11 (Cumberland)
Caivan Development Corporation

Dear Mr. Belan,

The Conservation Partners Planning and Development Review Team has completed a review of the above noted applications, which are to develop a residential subdivision consisting of 32 back-to-back townhouse units, 80 street townhouse units and to create a block for future development on municipal services. The property lies adjacent to Avalon West Neighbourhood 5 and abuts Avalon Encore Stage 6 to the east and south.

We have considered the environmental impacts of the development, as outlined under Sections 2.1 (Natural Heritage) and 3.1 (Natural Hazards) of the Provincial Policy Statement (May 1, 2020) issued under Section 3 of the *Planning Act*.

The following documents were provided with the applications:

i. Planning Rationale 2275 Mer Bleue Road. Prepared by Fotenn. Dated January 7, 2021.
ii. Functional Servicing Report. Prepared by DSEL. Dated January 6, 2021. Signed, stamped and dated January 6, 2021.
iii. East Urban Community Avalon Encore Stage 9 Storm Drain Area Plan. Prepared by Atrel Engineering Ltd. Dated March 2, 2018.

We offer the following comments on the development:

Planning Rationale

The property falls within the South Nation Conservation jurisdiction, not RVCA as stated on page 11 of the Planning Rationale.

Natural Heritage Feature and Natural Hazards

Our review did not identify any natural heritage features or natural hazards on the subject site.

Stormwater Management

A technical review of the stormwater management design was not undertaken as the property outlets to approved municipal infrastructure. Flows from the site are accounted for in the Avalon Encore Stage 6 design and will be directed into Avalon West (N5) SWM facility for both water quantity and quality control.

A full technical review may be required by the Conservation Partners should the approved release rates be exceeded or modification to the SWM facility be necessary.

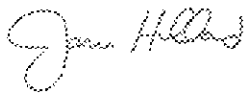
Conclusion

The Conservation Partners do not object to the proposed development. The following condition is requested in the decision of approval.

1. The Subdivision Agreement shall contain wording acceptable to the Conservation Partners.

I trust this review is to your satisfaction. If there are any questions or concerns, please feel free to contact our office.

Yours truly,



James Holland, MSc RPP
Watershed Planner
South Nation Conservation

Anton Udaltsov

7 - PRE-CONSULTATION MINUTES by City of Ottawa (September 30, 2020)

From: Belan, Steve <Steve.Belan@ottawa.ca>
Sent: September 30, 2020 5:41 PM
To: Hugo Lalonde; Julie Carrara
Cc: Steve Pichette; Mark Crockford; Andrew Harte
Subject: Pre-con Follow-up - 2275 Mer Bleue
Attachments: Mer Bleue 2275_UD Comments PRE1.docx; Pre-con comments_MerBleue.docx; AODA Checklist.docx; TIA Screening Form.pdf; 170401-S5.pdf; 170401-S4.pdf; 20-09-18_SK-02_Concept_2063.pdf; tree_sensitive_soil_guide_en.pdf

Hello Hugo

Please refer to the below [and/or attached notes] regarding the Pre-Application Consultation (pre-con) Meeting held on September 22, 2020 for the property at 2275 Mer Bleue Road for Major Rezoning/Subdivision in order to allow the development of subdivision consisting of new public streets with street townhouse unit and back to back units and a future mixed-used development block by Caivan Homes. I have also attached the required Plans & Study List for application submission.

Below [and attached] are staff's preliminary comments based on the information available at the time of pre-con meeting:

Planning

- The area is General Urban Area in the OP and a Commercial and Commercial/Residential in the Mer Bleue Community Design Plan
- After reviewing the Mer Bleue Community Design Plan I don't believe that an amendment to the plan as this proposal dose not change the number of high density residential block, change the location of the road or infrastructure network or remove an identified park.
- Zoning amendment will be necessary to rezone a large segment of the property to Residential uses and re-delineate where the mixed-use area will start.
- Subdivision application to create the public streets and development blocks.
- Applicant must now provide a proposed strategy for public consultation as directed by Bill 73
- Planning has concerns that the northern mixed-use (MU) block is being made too small. The three townhouse blocks abutting the MU block overlaps the existing street access to Mer Bleue. The removal of this access would limit the flexibility to develop the MU block.
- Planning will not support 16.5 m ROW in this new development. 18 metre right of ways are to be designed in.
- Window streets are not a preferred option by the City. Dwelling units facing Mer Bleue with a back lane would be preferred.
- The east assess to Aquarium is only wide enough for a pedestrian link. An equal size block will need to line up with this block on your development.
- Would like a more refined concept of how to develop the MU block I think that medical offices could work with the health hub to the north. Could be developed like the offices along CenterPoint Drive.

Urban Design

- Please refer to the attached comments

Engineering

The attached "Pre-application consultation servicing memo" summarizes engineering design considerations as per our discussion. [Ensure the memo addresses all relevant engineering issues.]

Submission Requirements

1. Water Boundary condition requests must include the location of the service and the expected loads required by the proposed development. Please provide the following information:

   Location of service connections (MAP)
   Type of development and the amount of fire flow required (as per FUS).
   Average daily demand: ___ l/s.
   Maximum daily demand: ___l/s.
   Maximum hourly daily demand: ___ l/s.

3. Required Plans and Reports:
   Submission:

   Draft Plan of Subdivision
   Concept Plan Showing Proposed Land Uses and Landscaping
   Planning Rationale
   Draft Streetscaping Plan
   Archaeological Resource Assessment (to satisfy a condition of draft approval/approval)
   Topographical Plan of Survey with a published bench mark
   Grading & Drainage Plan
   General Plan of Services
   Erosion & Sediment Control Plan
   Composite Utility Plan
   Design Brief and Stormwater Management Report
   Geotechnical Report
   Stationary Noise Study
   TIA
   TCR memo
   Phase 1 ESA
   Phase 2 ESA (if recommended by the Phase 1)

4. Storm Design
   The "Mer Bleue Community Design Plan Infrastructure Servicing Study" and "Avalon West (Neighbourhood 5), Stormwater Management Facility Design Report" prepared by IBI Group recommends that the storm water be conveyed to the existing Storm Water Management (SWM) Basin located south of Neighbourhood 5. N5 SWM Pond.

   Design Constraints
   The main storm drainage design constraints can be summarized as follows:

   Minor System
   i. Storm sewer designed using the rational formula for the 5 year storm using a time of concentration of 10 minutes.
   ii. The inflow rate into the minor system shall be limited to 220 L/s/ha, as per IBI's report.
   iii. Arterial roads area shall be restricted to a 1:10 year storm and a 10 minute inlet time which represents 238 l/s/ha according to IBI's report.

   Major System

On street routing and storage area must be provided and illustrated on the grade control plan. This routing must incorporate a maximum 0.35m flow depth on street under either static or dynamic conditions.

Some site Release Rates are currently in place, shown on these plans as 86 L/s via block 231 and Sculpin Street at 76.5 L/s. 162.5 L/s maximum RR.

5. Minimum Drawing and File Requirements- All Plans
Plans are to be submitted on standard A1 size (594mm x 841mm) sheets, utilizing an appropriate Metric scale (1:200, 1:250, 1:300, 1:400, or 1:500).
With all submitted plans provide an individual PDF of the plans unlocked and flattened.
Reports: please provide one complete PDF file of each reports.

*****Note that Mer Bleue and Brian Coburn has no sanitary sewer in available.

Feel free to contact Infrastructure Project Manager, [xx], at [contact information], for follow-up questions.]

Transportation

- Please see the attached comments
- A TIA and Noise Study will be required
- ROW are typically 14.5m for Window streets and 18 m for locals
- The proximity of the access to the roundabout will need further review.

Feel free to contact Transportation Project Manager, [xx], at [contact information], for follow-up questions.

Parkland

- Parkland dedication /Cash-in-lieu of parkland will be based on unit counts and parkland contributions made by the surrounding subdivisions.

Conservation Authority

- The South Nation Conservation Authority will be reviewing the application stormwater quality and quantity criteria.

Other

- Other concerns or notes
- You are encouraged to contact the Ward Councillor, Councillor xx, at [email] about the proposal.

Please refer to the links to "Guide to preparing studies and plans" and fees for further information. Additional information is available related to building permits, development charges, and the Accessibility Design Standards. Be aware that other fees and permits may be required, outside of the development review process. You may obtain background drawings by contacting informationcentre@ottawa.ca.

These pre-con comments are valid for one year. If you submit a development application(s) after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change. You are as well encouraged to contact us for a follow-up meeting if the plan/concept will be further refined.

Please do not hesitate to contact me if you have any questions.

Regards,

Steve Belan

Steve Belan, MCIP, RPP

Planner Planning Services, Development Review Services
Planning, Infrastructure and Economic Development
City of Ottawa / Ville d'Ottawa
110 Laurier Avenue West, 4th Floor / 110, avenue Laurier Ouest, 4e étage
Ottawa, ON K1P 1J1
Telephone / tél.: 613-580-2424 ext./poste 27591
E-mail / courriel: Steve.Belan@ottawa.ca

'

This e-mail originates from the City of Ottawa e-mail system. Any distribution, use or copying of this e-mail or the information it contains by other than the intended recipient(s) is unauthorized. Thank you.

Le présent courriel a été expédié par le système de courriels de la Ville d'Ottawa. Toute distribution, utilisation ou reproduction du courriel ou des renseignements qui s'y trouvent par une personne autre que son destinataire prévu est interdite. Je vous remercie de votre collaboration.

'

2275 Mer Bleue – City of Ottawa Planner: Steve Belan Urban Design Comments - Pre-consultation

Christopher Moise OAA MRAIC
Architect | Urban Designer
City of Ottawa

Comments

- Please refer to the CDP and provide a rationale to any changes proposed;
- The CDP also has extensive design guidelines associated with all aspects of this proposal so we expect that as the design develops these guidelines will be implemented;
- We can provide additional design review and guidance as more information is provided and the design develops.

This is an exciting project in an area full of potential. We look forward to helping you achieve its goals with the highest level of design resolution. We are happy to assist and answer any questions regarding the above. Good luck.

My pre-consultation notes are as follows:

- Follow Traffic Impact Assessment Guidelines
    - Screening form (attached), Screening form will have to be reviewed by the Transportation Project Manager. After review and if, any trigger is satisfied, TIA will be required.
    - Start this process as soon as possible.
    - Applicant advised that their application will not be deemed complete until the submission of step 1-4, including the functional draft RMA package (if applicable) and/or monitoring report (if applicable).
    - Request base mapping asap if RMA is required. Contact Engineering Services (https://ottawa.ca/en/city-hall/planning-and-development/engineering-services)
- Geometric Road Design (GRD) drawings will be required with the first submission of underground infrastructure and grading drawings. These drawings should include such items as, but is not limited to:
    - Road Signage and Pavement Marking for the subdivision;
    - Intersection control measure at new internal intersections; and
    - Location of depressed curbs and TWSIs;
    - More details can be provided upon request
- Residential streets (local and collector) are to be designed for 30 kph speed limits (posted)
- Ensure the roads are designed in accordance with the traffic calming and collector road guidelines (if applicable).
- Site triangles at the following locations on the final plan will be required:
    - Collector Road to Arterial Road: 5 metre x 5 metres
- Noise Impact Studies required for the following:
    - Road
    - Stationary (if there will be any exposed mechanical equipment due to the proximity to neighbouring noise sensitive land uses)
- On site plan:
    - Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
    - Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
    - Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
    - Show lane/aisle widths.
    - Sidewalk is (not) to be continuous across access as per City Specification 7.1.
- The City recommends development on private property be in accordance with the City's Accessibility Design Standards (see attached Site Plan Checklist, which summarizes AODA requirements). As the proposed site is commercial/institutional/industrial and for general public use, AODA legislation applies.

- The City recommends development on private property be in accordance with the Accessibility Design Standards (AODA legislation). As the site proposed is residential, it is suggested that the design conforms to the Site Plan Checklist, which summarizes AODA requirements (attached).

Site Plan Checklist – City of Ottawa Accessible Design Standards

1. Accessible Parking Spaces

The terms Type A and Type B Parking Spaces have the same meaning as within O. Reg. 191/11

This section applies to:

1) *Parking garages and related structures*
2) *Surface parking*
3) *On-street parking*

Standard Ref.	Requirements	Compliance	Comments
3.1.1.	**Provision:** 1 Type A accessible parking space must be provided where there are 12 or fewer spaces (see Table 3 for a complete list)	Y N N/A	
3.1.2	**Provision:** 4% of the total number of parking spaces should be accessible	Y N N/A	
3.1.2	**Provision:** if the total number of spaces is greater than 1001, provide 11 accessible parking spaces plus an addition 1% of the total number of spaces	Y N N/A	
3.1.3	**Access Aisle:** minimum of 1.5 m (see Figure 25)	Y N N/A	
3.1.3	**Location:** a maximum of 30 m from nearest accessible entrance	Y N N/A	
3.1.3	**Surface:** firm, stable and slip resistant	Y N N/A	
3.1.3	**Running slope:** maximum of 1:50 (2%)	Y N N/A	
3.1.3	**Cross slope:** maximum of 1:50 (2%)	Y N N/A	
3.1.3	**Type A spaces:** Length 5.2 m Width 3.4 m Type B spaces Length: 5.2 m Width: 2.4 m	Y N N/A	
3.1.3	**Overhead clearance:** minimum of 2.1 m	Y N N/A	
3.1.3	**Access Aisle:** minimum of 1.5 m. Must be clearly marked and adjacent to accessible parking space	Y N N/A	
3.1.4.1	**Vertical Signage:** **Width:** 0.3 m **Height:** 0.6 m (minimums)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

	Mounted: 1.5 m to 2.0 m high at centre • Marked with International Symbol of Accessibility (see Figure 25)		
3.1.4.2	**Pavement Markings** • Marked with the International Symbol of Accessibility • 15.25 m wide by 15.25 m deep • Locate near the back of the space for 90 degree or angled parking spaces • Locate in the centre for parallel parking spaces (see Figure 27)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

2. Passenger Loading Zone			
Standard Ref.	Requirements	Compliance	Comments
3.2.1	**Location:** maximum of 30 m from nearest accessible entrance	Y N N/A	
3.2.1	**Side Access Aisle** **Length:** 7.4 m **Width:** 2.4 m (minimums) (see Figure 28)	Y N N/A	
3.2.1	**Vertical Clearance:** 3.6 m	Y N N/A	
3.2.1	**Path of Travel:** minimum of 1.8 m wide to nearest accessible entrance	Y N N/A	
3.2.1.1	**Vertical Signage** **Width**: 0.3 m by 0.6 m **Mount:** 1.5 m to 2.0 m high at centre (see Figure 29)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

3. Exterior Paths of Travel

Where stairs are located on an accessible exterior route or walkway, an alternative accessible route is to be provided immediately adjacent to the stairs.

This section applies to:
1) *Pedestrian routes that serve facility entrances*
2) *Pedestrian routes that serve as a connection between a site boundary and entrance into the site*
3) *Public Rights-of-Way*
4) *Ramps and Curb Ramps*

Standard Ref.	Requirements	Compliance	Comments
3.3.1	**Surface:** firm, stable and slip resistant	Y N N/A	
3.3.1	**Lighting:** Provide in accordance with Section 5.7 (Lighting)	Y N N/A	
3.3.2	**Path of travel:** minimum 1.8 m wide	Y N N/A	
3.3.3.1	**Running Slope:** 1:20 (5%) (maximum)	Y N N/A	
3.3.3.2	**Cross Slope:** 1:20 (2%) (maximum) where surface is concrete or asphalt. 1:10 (10%) in all other cases.	Y N N/A	
3.3.1	**Rest Area:** If width is less than 1.8 m, provided every 30 m along path of travel. Rest area to be 1.8 m by 1.8 m (minimums)	Y N N/A	
3.3.4	**Guards:** Provide when change in level is more than 0.6 m	Y N N/A	
2.1.4	**Gratings or Openings:** 13 mm (maximum) wide in direction of travel. Longest side, if rectangular, must be perpendicular with the direction of travel	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

4. Curb Ramps

A curb ramp provides a transition where there is a change in level between exterior path of travel and adjacent vehicular route.

This section applies to:
1) *Pedestrian crossings at intersections*
2) *Parking spaces, passenger loading zones and related access aisles*
3) *Any other exterior route where there is a grade change*

Standard Ref.	Requirements	Compliance	Comments
3.4.1	**Surface:** firm, stable and slip resistant	Y N N/A	
3.4.2	**Clear width:** 1.5 m (minimum), exclusive of flares	Y N N/A	
3.4.3	**Running Slope**: 1:12 (8.33%) (maximum)	Y N N/A	
3.4.3	**Cross Slope:** 1:50 (2%) (maximum) (see Figure 33b)	Y N N/A	
3.4.6	**Tactile Surface Walking Indicators (TWSI):** minimum depth of 610mm, at 150 mm to 200 mm from edge of curb (see 33b)	Y N N/A	
3.4.2.2	**Flared Side:** 1m wide; slope 1:15 to 1:10.	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

5. Ramps

Ramps are provided when the slope of a path of travel exceeds a gradient of 1:20 (5%)

Refer to the Ontario Building Code for all applied requirements for ramps

For all ramp standards, see Figure 3

Standard Ref.	Requirements	Compliance	Comments
2.2.1.1	**Running Slope:** 1:15 (6.67%)	Y N N/A	
2.2.1.2	**Cross-Slope:** 1:50 (2%)	Y N N/A	
2.2.1	**Surface:** firm, stable and slip-resistant	Y N N/A	
2.2.1	**Clear Width:** 1.1 m (minimum)	Y N N/A	
2.2.1.4	**Colour Contrasting Strip:** to be provided at slope changes. 50 mm wide colour-contrasted and slip resistant strip equal to the width of the ramp	Y N N/A	
2.2.1	**Lighting:** provide in accordance with Section 5.7 (Lighting)	Y N N/A	
2.2.2	**Length:** 9 m, or less, or provide landing	Y N N/A	
2.2.2	**Landing:** to be provided at top, bottom or intermediate level, or where there is directional change. (see Figure 5)	Y N N/A	
2.2.3.1	**Handrail:** 865 to 965 mm high on both sides. **Clear width**: 1.1 m between handrails (see Figure 8)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

6. Stairs

This section applies to stairs provided for exterior or interior environments

Refer to the Ontario Building Code for all applied requirements for stairs

For all stair standards, see Figure 10

Standard Ref.	Requirements	Compliance	Comments
2.3	**Stairs:** where provided, an alternative accessible route is to be provided immediately adjacent, and may include a ramp or other accessible means of negotiating grade change	Y N N/A	Note which alternative to stairs is provided.
2.3.1	**Surface:** firm, stable and slip-resistant	Y N N/A	
2.3.1.1	**Tread:** 280 mm to 355 mm deep	Y N N/A	
2.3.1.1	**Riser:** 125 mm to 180 mm high	Y N N/A	
2.3.1	**Open Riser:** not permitted	Y N N/A	
2.3.1.2	**Nosing Projection:** 38 mm (maximum) (see Figure 10)	Y N N/A	
2.3.1.2	**Nosing Strip**: 50 mm deep, colour contrasted, at leading edge of tread and extending the full length of the tread	Y N N/A	
2.3.1.3	**Tactile Surface Walking Indicators (TWSI):** minimum of 610 mm deep, one tread back (see Figure 11)	Y N N/A	
2.3.1	**Lighting:** to be provided in accordance with Section 5.7	Y N N/A	
2.3.2.2	**Handrail:** 865 mm to 965 mm high on both sides. (see Figure 12)	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

7. Building Entrance			This section does not apply ☐
Standard Ref	Requirements	Compliance	Comments
4.1.1	**Provision:** at least one (1) accessible entrance 50% of the total number of building entrances (see Figure 36)	Y N N/A	
4.1.1	**Provision:** 50% of the total number of building entrances must be accessible (see Figure 36)	Y N N/A	
4.1.1	**Provision:** 30 m or less from nearest accessible parking space, or passenger loading or drop off zones	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

8. Benches and Seats

This section applies to:
1) Rest areas and accessible routes
2) Outdoor public use seating areas
3) Waiting areas

Standard Ref	Requirements	Compliance	Comments
2.10.1	Seat height between 450 mm and 500 mm above finished floor (see Figure 23)	Y N N/A	
2.10.1	Seat depth between 330 mm and 510 mm	Y N N/A	
2.10.1	Back support extending 320 mm (minimum) above seat surface	Y N N/A	
2.10.1	Provide at least one (1) armrest at a height between 220 mm and 300 mm from the seat for additional support	Y N N/A	

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

Note – this Checklist must be read in conjunction with the City of Ottawa's Accessible Design Standards Document, 2015. All figures referenced in this document can be found in the City's Accessible Design Standards document.

City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	
Description of Location	
Land Use Classification	
Development Size (units)	
Development Size (m^2)	
Number of Accesses and Locations	
Phase of Development	
Buildout Year	

If available, please attach a sketch of the development or site plan to this form.

2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m^2
Industrial	5,000 m^2
Fast-food restaurant or coffee shop	100 m^2
Destination retail	1,000 m^2
Gas station or convenience market	75 m^2

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

If the proposed development size is greater than the sizes identified above, the Trip Generation Trigger is satisfied.

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

If any of the above questions were answered with 'Yes,' the Location Trigger is satisfied.

4. Safety Triggers

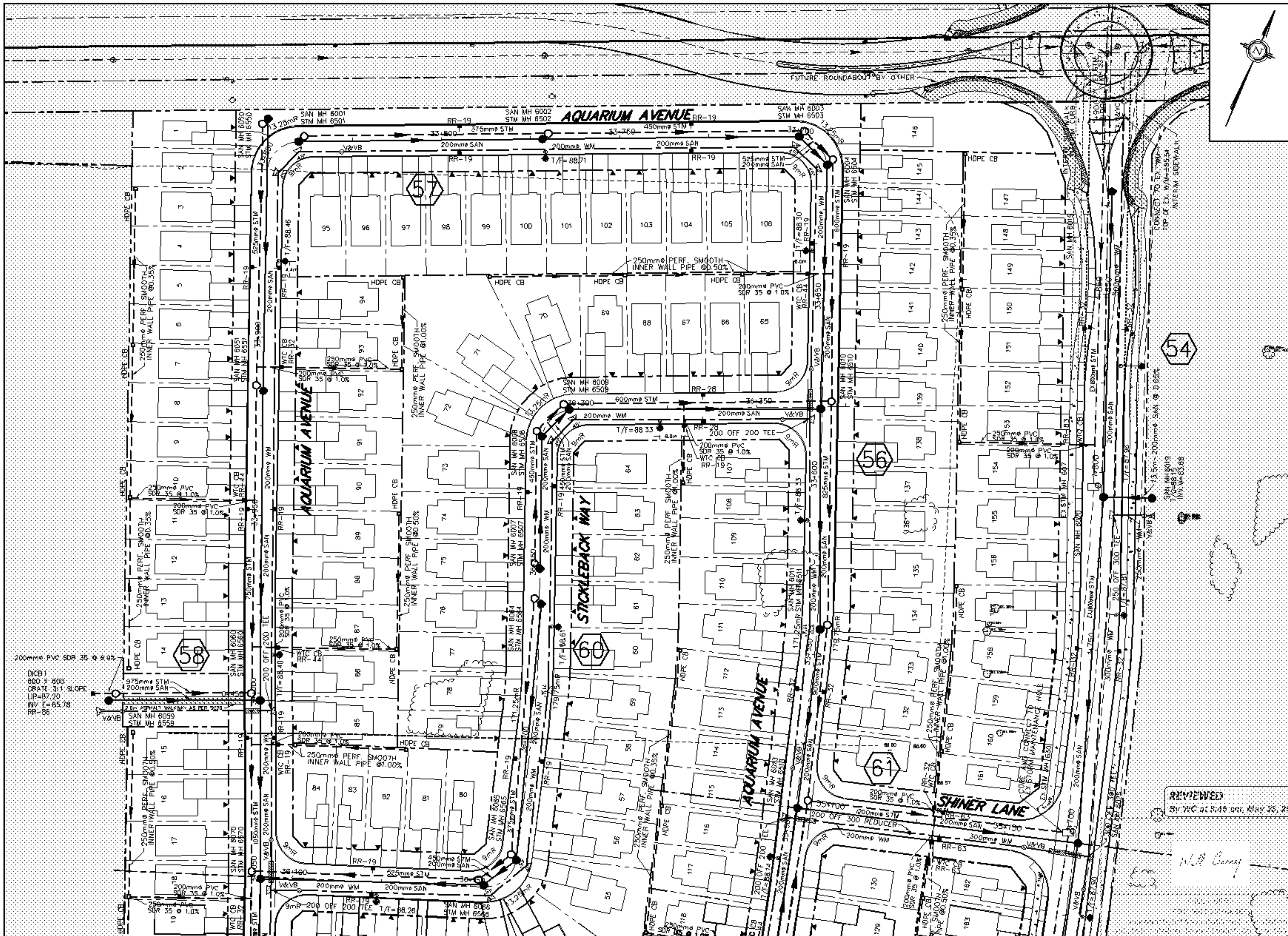
	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?		
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural conditions, or within 150 m of intersection in urban/ suburban conditions)?		
Is the proposed driveway within auxiliary lanes of an intersection?		
Does the proposed driveway make use of an existing median break that serves an existing site?		
Is there is a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		
Does the development include a drive-thru facility?		

If any of the above questions were answered with 'Yes,' the Safety Trigger is satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?		
Does the development satisfy the Location Trigger?		
Does the development satisfy the Safety Trigger?		

If none of the triggers are satisfied, the TIA Study is complete. If one or more of the triggers is satisfied, the TIA Study must continue into the next stage (Screening and Scoping).



NOTES:

1. CONSTRUCT ALL WATERMAIN TO CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS (0500) AND SPECIFICATIONS. BEDDING SHALL BE AS PER OPSD 1102.01 AND OPSD 1102.02
2. PROVIDE INSULATION AT CATCHBASINS IN ACCORDANCE WITH CITY OF OTTAWA'S STANDARD DETAIL DRAWING W23.
3. INSTALL ALL SERVICES IN ACCORDANCE WITH CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS R21, W26, W36, W38 AND S11.1.
4. PROVIDE CATHODIC PROTECTION ON WATERMAIN AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.
5. RESTRAIN ALL BENDS, TEES, AND CAPS TO CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.
6. ALL PROPOSED WATER SERVICES AND MAINS MUST HAVE MINIMUM COVER OF 2.4m OTHERWISE PROVIDE THERMAL INSULATION AS PER OSDD W22.
7. ALL SIDEWALKS SHALL BE HANDICAP ACCESSIBLE AND AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC4, SC6 AND SC7.2.
8. ALL CONNECTION TO EXISTING WATERMAIN STUB SHALL BE PERFORM BY THE CITY OF OTTAWA. THE EXCAVATION, BACKFILL AND REINSTATEMENT SHALL BE PERFORM BY THE CONTRACTOR.
9. CONNECT TO EXISTING SANITARY, STORM AND WATERMAIN STUBS.
10. IN AREAS WHERE SERVICE TRENCHES ARE LOCATED WITHIN 3 METRES OF RESIDENTIAL FOUNDATION, SUCH AS REAR YARD CATCHBASIN LEADS, IT WILL BE NECESSARY TO BACKFILL THE PORTION OF THE TRENCH BELOW THE FOUNDATION LEVEL WITH ENGINEERED FILL.
11. FOR THRUST BLOCK DESIGN ON THE WATERMAIN, A SOIL BEARING CAPACITY OF 90 KPA CAN BE USED (REFER TO 170401-701 FOR DESIGN).
12. ALL STORM SEWERS WITH 900mm IN DIAMETER AND GREATER MUST BE BENCHED. ALL SANITARY MANHOLES MUST BE BENCHED. SEWER SHALL HAVE CLASS "B" BEDDING.
13. THE CITY OF OTTAWA WILL NOT PERMIT ANY ENCROACHMENTS ONTO ANY REAR YARD CATCH BASIN LEAD DRAINAGE EASEMENTS.
14. ALL STORM AND SANITARY SERVICES ARE TO BE EQUIPPED WITH A BACKWATER VALVE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S14 AND S14.2.
15. ALL HYDRANTS ARE TO BE LOCATED AND INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS W18 AND W19.
16. CONTRACTOR IS TO REPAIR BENCHING TO ALL EXISTING SAN MH PRIOR TO CONNECTIONS.
17. SPECIAL PIPE BEDDING AND COVER IS REQUIRED IN AREAS OF GRAY SILTY CLAY AND SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO BACKFILL.
18. CURBS SHALL BE DEPRESSED AT EVERY ENTRANCE CROSSING AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC1.1 AND SC7.1.
19. PERFORATED PIPE FOR REAR YARD SHALL BE INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S29.
20. ALL MANHOLE COVERS ARE TO HAVE RUBBER PLUGS AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S24 AND S24.1.
21. STORM AND SANITARY SERVICE CONNECTIONS MUST BE ABOVE THE SPRING LINE OF THE SEWER MAIN PIPE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S11.
22. SERVICE CONNECTIONS TO SEWERS OVER 5m DEEP REQUIRE APPROVED CONTROLLED SETTLEMENT JOINTS AS PER CITY OF OTTAWA STANDARD DETAIL DRAWINGS S11 AND S11.1.

LEGEND

Symbol	Description
DEC 300mm	EXISTING DECIDUOUS TREE
	EXISTING TREE LINE
	EXISTING FIRE HYDRANT
VC	EXISTING VALVE AND VALVE CHAMBER
EX V&VB	EXISTING VALVE AND VALVE BOX
	EXISTING STORM MANHOLE
	EXISTING SANITARY MANHOLE
	EXISTING CATCHBASIN
LP	EXISTING LIGHT POLE
HP	EXISTING HYDRO POST
	EXISTING SIGN
Transf.	EX. PADMOUNT HYDRO TRANSFORMER
BPed	EXISTING BELL PEDESTAL
TVPed	EXISTING CABLE PEDESTAL
SIB	EXISTING STANDARD IRON BAR
	EXISTING WATERMAIN
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	PROPOSED WATERMAIN
	PROPOSED STORM SEWER
	PROPOSED SANITARY SEWER
	PROPOSED STORM MANHOLE
	PROPOSED SANITARY MANHOLE
	PROPOSED BEND C/W THRUSTBLOCK (SPECIAL DESIGN)
	PROPOSED CAP C/W THRUSTBLOCK (SPECIAL DESIGN)
V&VB	PROPOSED VALVE AND VALVE BOX
V&VC	PROPOSED VALVE AND VALVE CHAMBER
	PROPOSED FIRE HYDRANT
DICB	PROPOSED DITCH INLET CATCHBASIN AS PER OPSD 705.030
HDPE CB	PROPOSED HDPE CB AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S30 AND S31.
WTC	PROPOSED WATERTIGHT COVER
CB	PROPOSED CATCHBASIN
	PROPOSED INSULATION
T/F=87.38	PROPOSED TOP OF FLANGE ELEVATION
▲	HOUSE SERVICE
9mR	CURB RADIUS
TWSI	TACTILE WALKING SURFACE INDICATORS AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC 7 AND SC 7.3
	OUTSIDE PROPOSED DEVELOPMENT
	SITE PLAN APPROVAL

AVALON ENCORE STAGE 6 PERMANENT ICD

RR-19 = 83mm DIAMETER ICD, RELEASE RATE OF 19.0 L/S
RR-24 = 94mm DIAMETER ICD, RELEASE RATE OF 24.0 L/S
RR-28 = 102mm DIAMETER ICD, RELEASE RATE OF 28.5 L/S
RR-32 = 108mm DIAMETER ICD, RELEASE RATE OF 32.0 L/S
RR-44 = 127mm DIAMETER ICD, RELEASE RATE OF 44.0 L/S
RR-45 = 127mm DIAMETER ICD, RELEASE RATE OF 45.0 L/S
RR-62 = 152mm DIAMETER ICD, RELEASE RATE OF 62.0 L/S
RR-63 = 152mm DIAMETER ICD, RELEASE RATE OF 63.0 L/S
RR-65 = 152mm DIAMETER ICD, RELEASE RATE OF 65.0 L/S

AVALON ENCORE STAGE 6 TEMPORARY ICD

DICB 1 - RR-86 = 178mm DIAMETER ICD, RELEASE RATE OF 86.0 L/S
DICB 2 - RR-78.5 = 178mm DIAMETER ICD, RELEASE RATE OF 78.5 L/S
DICB 3 - RR-45 = 127mm DIAMETER ICD, RELEASE RATE OF 45.0 L/S
STMH 6628 - RR-53 = 127mm DIAMETER ICD, RELEASE RATE OF 53.0 L/S (PLUG TYPE)

OUTSIDE OF PROPOSED DEVELOPMENT ICD

RR-41 = 127mm DIAMETER ICD, RELEASE RATE OF 41.0 L/S
RR-80 = 152mm DIAMETER ICD, RELEASE RATE OF 80.0 L/S
RR-74 = 188mm DIAMETER ICD, RELEASE RATE OF 74.0 L/S
RR-288 = 334mm DIAMETER ICD, RELEASE RATE OF 288.0 L/S

* REFER TO 170401-701 FOR DETAILS
* ICD SHALL BE WALL MOUNT TYPE EXCEPT IF IDENTIFIED OTHERWISE

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

minto

No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
1	AS PER CITY COMMENTS	MAR. 16/18	AGS
2	ISSUED FOR TENDER	MAR. 28/18	AGS
3	AS PER CITY COMMENTS	APR. 26/18	AGS
4	ISSUED FOR CONSTRUCTION	MAY 7/18	AGS
5	AS PER CITY COMMENTS	MAY 17/18	AGS

SCALE 1:500

DESIGN	PLM
CHECKED	AGS
DRAWN	PNC
CHECKED	PLM
APPROVED	AGS

LICENSED PROFESSIONAL ENGINEER [redacted] s.21 PROVINCE OF ONTARIO

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

CLIENT No. 148
PROJECT No. 170401

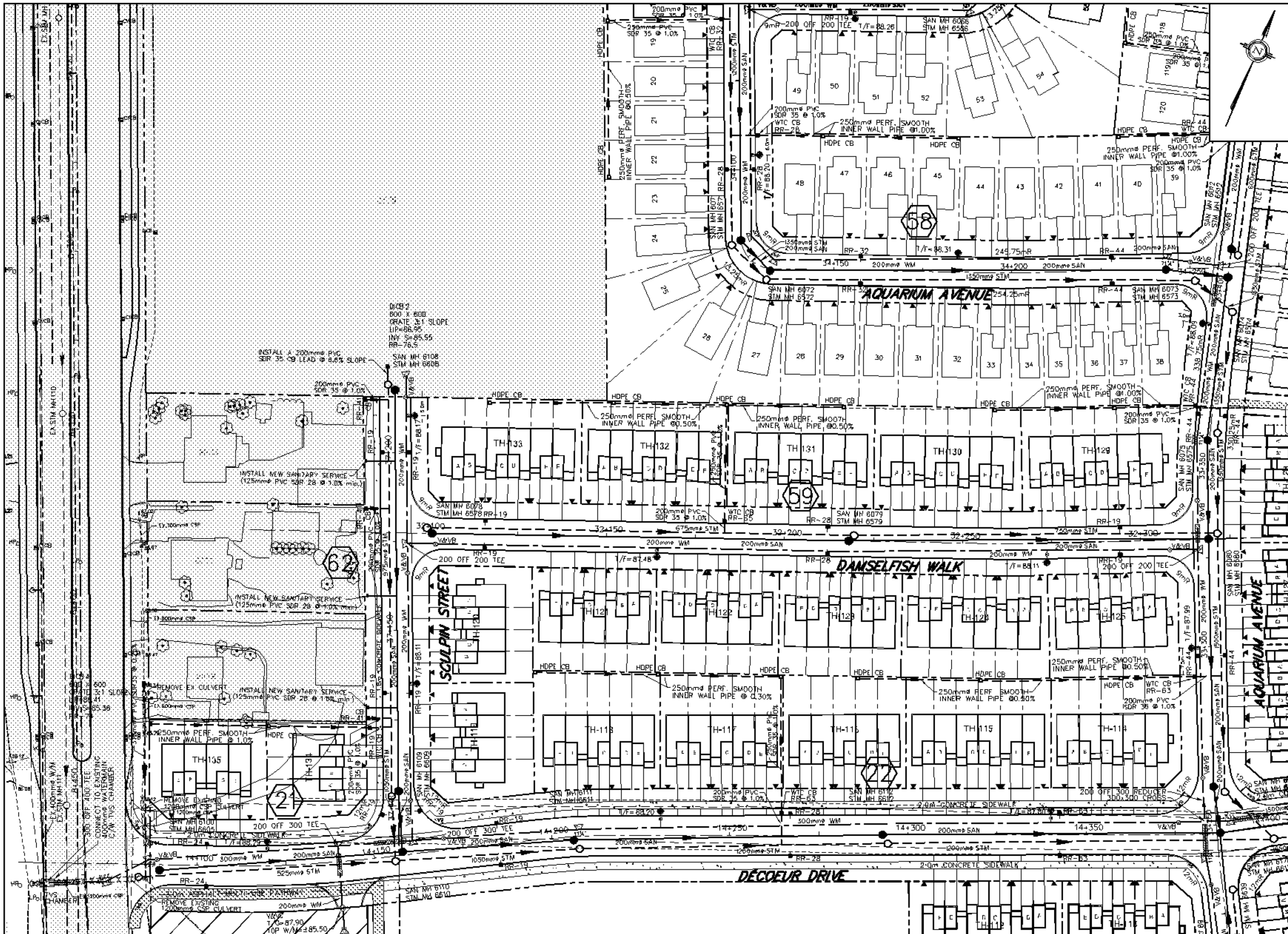
PLAN
GENERAL PLAN OF SERVICES

DRAWING No. 170401-S5

D07-16-09-0018-STAGE 6

16796

000375



NOTES:

1. CONSTRUCT ALL WATERMAIN TO CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS (0900) AND SPECIFICATIONS. BEDDING SHALL BE AS PER OPSD 1102.01 AND OPSD 1102.02
2. PROVIDE INSULATION AT CATCHBASINS IN ACCORDANCE WITH CITY OF OTTAWA'S STANDARD DETAIL DRAWING W23.
3. INSTALL ALL SERVICES IN ACCORDANCE WITH CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS R21, W26, W36, W38 AND S11.1.
4. PROVIDE CATHODIC PROTECTION ON WATERMAIN AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.
5. RESTRAIN ALL BENDS, TEES, AND CAPS TO CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS AND SPECIFICATIONS.
6. ALL PROPOSED WATER SERVICES AND MAINS MUST HAVE MINIMUM COVER OF 2.4m OTHERWISE PROVIDE THERMAL INSULATION AS PER OSDD W22.
7. ALL SIDEWALKS SHALL BE HANDICAP ACCESSIBLE AND AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC4, SC6 AND SC7.2.
8. ALL CONNECTION TO EXISTING WATERMAIN STUB SHALL BE PERFORM BY THE CITY OF OTTAWA. THE EXCAVATION, BACKFILL AND REINSTATEMENT SHALL BE PERFORM BY THE CONTRACTOR
9. CONNECT TO EXISTING SANITARY, STORM AND WATERMAIN STUBS.
10. IN AREAS WHERE SERVICE TRENCHES ARE LOCATED WITHIN 3 METRES OF RESIDENTIAL FOUNDATION, SUCH AS REAR YARD CATCHBASIN LEADS, IT WILL BE NECESSARY TO BACKFILL THE PORTION OF THE TRENCH BELOW THE FOUNDATION LEVEL WITH ENGINEERED FILL.
11. FOR THRUST BLOCK DESIGN, ON THE WATERMAIN, A SOIL BEARING CAPACITY OF 90 KPA CAN BE USED (REFER TO 170401-101 FOR DESIGN).
12. ALL STORM SEWERS WITH 900mm IN DIAMETER AND GREATER MUST BE BENCHED. ALL SANITARY MANHOLES MUST BE BENCHED. SEWER SHALL HAVE CLASS "B" BEDDING
13. THE CITY OF OTTAWA WILL NOT PERMIT ANY ENCROACHMENTS ONTO ANY REAR YARD CATCH BASIN LEAD DRAINAGE EASEMENTS.
14. ALL STORM AND SANITARY SERVICES ARE TO BE EQUIPPED WITH A BACKWATER VALVE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S14 AND S14.2
15. ALL HYDRANTS ARE TO BE LOCATED AND INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS W18 AND W19.
16. CONTRACTOR IS TO REPAIR BENCHING TO ALL EXISTING SAN MH PRIOR TO CONNECTIONS.
17. SPECIAL PIPE BEDDING AND COVER IS REQUIRED IN AREAS OF GRAY SILTY CLAY AND SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO BACKFILL
18. CURBS SHALL BE DEPRESSED AT EVERY ENTRANCE CROSSING AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC1.1 AND SC7.1.
19. PERFORATED PIPE FOR REAR YARD SHALL BE INSTALLED AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S29.
20. ALL MANHOLE COVERS ARE TO HAVE RUBBER PLUGS AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS S24 AND S24.1.
21. STORM AND SANITARY SERVICE CONNECTIONS MUST BE ABOVE THE SPRING LINE OF THE SEWER MAIN PIPE AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S11
22. SERVICE CONNECTIONS TO SEWERS OVER 5m DEEP REQUIRE APPROVED CONTROLLED SETTLEMENT JOINTS AS PER CITY OF OTTAWA STANDARD DETAIL DRAWINGS S11 AND S11.1.

LEGEND

Symbol	Description
DEC 300mm	EXISTING DECIDUOUS TREE
	EXISTING TREE LINE
	EXISTING CATCHBASIN
LP	EXISTING LIGHT POLE
HP	EXISTING HYDRO POLE
	EXISTING VALVE
Trans	EX PADMOUNT HYDRO TRANSFORMER
BPed	EXISTING BELL PEDESTAL
TVPed	EXISTING CABLE PEDESTAL
SIB	EXISTING STANDARD IRON BAR
	EXISTING WATERMAIN
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	PROPOSED WATERMAIN
	PROPOSED STORM SEWER
	PROPOSED SANITARY SEWER
	PROPOSED STORM MANHOLE
	PROPOSED SANITARY MANHOLE
	PROPOSED BEND C/W THRUSTBLOCK (SPECIAL DESIGN)
	PROPOSED CAP C/W THRUSTBLOCK (SPECIAL DESIGN)
V&VB	PROPOSED VALVE AND VALVE BOX
V&VC	PROPOSED VALVE AND VALVE CHAMBER
	PROPOSED FIRE HYDRANT
DICB	PROPOSED DITCH INLET CATCHBASIN AS PER OPSD 705.030
HDPE CB	PROPOSED HDPE CB AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWING S30 AND S31.
WTC	PROPOSED WATERTIGHT COVER
CB	PROPOSED CATCHBASIN
	PROPOSED INSULATION
T/F=87.38	PROPOSED TOP OF FLANGE ELEVATION
▲	HOUSE SERVICE
9mR	CURB RADIUS
TWSI	TACTILE WALKING SURFACE INDICATORS AS PER CITY OF OTTAWA'S STANDARD DETAIL DRAWINGS SC 7 AND SC 7.3
	OUTSIDE PROPOSED DEVELOPMENT
	SITE PLAN APPROVAL
	BM TOP OF FLANGE – HYDRANT ±450mm ABOVE GROUND LEVEL ON SOUTH SIDE OF DECOEUR DRIVE ELEV.=87.48

REVIEWED
By WC at 8:44 am, May 28, 2018

AVALON ENCORE STAGE 6 PERMANENT ICD

RR-19 = 83mm DIAMETER ICD, RELEASE RATE OF 19.0 L/S
RR-24 = 94mm DIAMETER ICD, RELEASE RATE OF 24.0 L/S
RR-28 = 102mm DIAMETER ICD, RELEASE RATE OF 28.5 L/S
RR-32 = 108mm DIAMETER ICD, RELEASE RATE OF 32.0 L/S
RR-44 = 127mm DIAMETER ICD, RELEASE RATE OF 44.0 L/S
RR-45 = 127mm DIAMETER ICD, RELEASE RATE OF 45.0 L/S
RR-62 = 152mm DIAMETER ICD, RELEASE RATE OF 62.0 L/S
RR-63 = 152mm DIAMETER ICD, RELEASE RATE OF 63.0 L/S
RR-65 = 152mm DIAMETER ICD, RELEASE RATE OF 65.0 L/S

AVALON ENCORE STAGE 6 TEMPORARY ICD

DICB 1 – RR-86 = 178mm DIAMETER ICD, RELEASE RATE OF 86.0 L/S
DICB 2 – RR-78.5 = 178mm DIAMETER ICD, RELEASE RATE OF 78.5 L/S
DICB 3 – RR-45 = 127mm DIAMETER ICD, RELEASE RATE OF 45.0 L/S
CBMH 6626 – RR-53 = 127mm DIAMETER ICD, RELEASE RATE OF 53.0 L/S (PLUG TYPE)

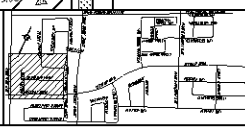
OUTSIDE OF PROPOSED DEVELOPMENT ICD

RR-41 = 127mm DIAMETER ICD, RELEASE RATE OF 41.0 L/S
RR-80 = 152mm DIAMETER ICD, RELEASE RATE OF 80.0 L/S
RR-74 = 188mm DIAMETER ICD, RELEASE RATE OF 74.0 L/S
RR-288 = 334mm DIAMETER ICD, RELEASE RATE OF 288.0 L/S

* REFER TO 170401-101 FOR DETAILS
* ICD SHALL BE WALL MOUNT TYPE EXCEPT IF IDENTIFIED OTHERWISE

THE POSITION OF ALL POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, DETERMINE THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND ASSUME ALL LIABILITY FOR DAMAGE TO THEM.

minto



No	REVISION △-APPLIES WHEN DRAWING MODIFIED	DATE	BY
△	AS PER CITY COMMENTS	MAR. 16/18	AGS
△	ISSUED FOR TENDER	MAR. 28/18	AGS
△	AS PER CITY COMMENTS	APR. 26/18	AGS
△	ISSUED FOR CONSTRUCTION	MAY 7/18	AGS
△	AS PER CITY COMMENTS	MAY 17/18	AGS

SCALE 1:500 (5m 0 15m)

DESIGN	PLM
CHECKED	AGS
DRAWN	PNC
CHECKED	PLM
APPROVED	AGS

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — s.21

ATREL Engineering Ltd.

CITY OF OTTAWA
EAST URBAN COMMUNITY
AVALON ENCORE STAGE 6

MINTO COMMUNITIES INC.

CLIENT No 148
PROJECT No. 170401

PLAN
GENERAL PLAN OF SERVICES

DRAWING No 170401-S4

D07-16-09-0018-STAGE 6

16796

000376

DRAFT

- All Units In Metric Unless Otherwise Noted.
- Base Information Obtained From Various Sources And Is Approximate.
- Schedule / Plan Information Is Conceptual And Requires Verification by Appropriate Agency.
- Aerial Photo: Google Earth, Approx. Spring 2018.

GERRARD DESIGN

CAIVAN 2075 MER BLEUE | Ottawa, Ontario

PRELIMINARY LOTTED CONCEPT

SEP 18, 2020
PROJECT 2063
SCALE 1:1500

SK-02

000377

Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines

Background: Existing Clay Soils Policy

The City of Ottawa's Clay Soils Policy, as it is often referred to by city staff and external stakeholders, is derived from a 2005 report titled Trees and Foundations Strategy in Areas of Sensitive Marine Clay in the City of Ottawa (approved by Planning and Environment Committee on September 27, 2005 and by City Council on October 12, 2005).

This report was mainly focused on the provision of a risk management framework for the assessment and mitigation or possible removal of existing City trees where the trees were identified as a significant contributing factor for foundation damage. One of the six recommendations speaks to the planting of new trees on City property in Sensitive Marine Clay (SMC) soils, which can be used interchangeably with the more technical terminology of Champlain Sea Clay soils – but for the purposes of this report, the term Sensitive Marine Clay soils will be used because of historical continuity with the 2005 report noted above.

This recommendation established that when planting trees on city property where SMC soils are known to exist, the tree must be low water demand and planted at a distance equivalent to the full mature height of the tree from a building foundation or structure. This became the Council direction and policy for all new street tree planting in SMC soils, or simply, the Clay Soils Policy.

The practical result of the implementation of this policy has been many new subdivisions with only four varieties of small ornamental trees (Amur Maple, Serviceberry, Crab Apple and Japanese Lilac, which can be planted at a separation distance of 7.5 meters, their approximate mature height, from a building foundation) and some streets with no trees at all.

The Policy has since been described by some stakeholders as overly onerous, highly risk adverse, and based on inadequate scientific evidence. The results have been undesirable for residents, the Development Industry, and the City of Ottawa, who all wish to see tree-lined streets that contribute to the health and liveability of new communities and to work towards Council's strategic initiative of increasing urban forest cover.

Towards an Improved Clay Soils Policy

In March 2015, Planning Committee approved the report titled Building Better and Smarter Suburbs: Strategic Directions and Action Plan. Two of the Action Plan items in the report specifically dealt with obtaining better geotechnical information on clay soils and using that improved scientific basis to bring flexibility to the existing Clay Soils Policy where warranted. This builds on the early work of the draft Street Tree Manual for Greenfield Neighbourhoods, which demonstrated that improvements to tree planting in greenfield communities could only be accomplished by revising the Clay Soils Policy.

During the spring and summer of 2016, under the direction of the Greater Ottawa Homebuilders Association, a group of companies with expertise in geotechnical engineering, landscape architecture and forestry, including Golder, Paterson, Houle Chevrier, NAK and IFS Associates, undertook a review the City of Ottawa's existing requirements for tree planting in sensitive marine clay soils. Background information used for this review included the City of Ottawa's Draft Street Tree Manual (June 2015) and the United Kingdom's National House Building Council – Chapter 4.2 Building Near Trees (NHBC Standards 2016).

This 2016 review resulted in proposed technical revisions to the Clay Soils Policy. City staff from Forestry, Planning, Parks and Facilities Planning, and Legal have reviewed and built upon these proposed revisions to produce the Tree Planting in Sensitive Marine Clay Soils – 2017 Guidelines. These collaborative efforts are

based on the notion of planting trees in SMC soils in accordance with improved scientific and geotechnical information, with updated technical and procedural details outlined in this document.

The Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines were received by Planning Committee on September 26, 2017, and approved by delegated authority in October 2017. Going forward, implementation of the 2017 Guidelines is expected to increase the number and/or size and variety of street trees in new subdivisions in areas of sensitive marine clay soils.

Guidelines for Tree Planting in Sensitive Marine Clay Soils

The following Guidelines are primarily focused on small and medium size street trees. However, large trees (mature height over 14m) can still be planted in areas of SMC soils provided a tree to foundation setback equal to the full mature height of the tree can be provided (e.g. in a park or other green space).

For street trees in the road right-of-way where SMC soils have been identified, the tree to foundation setbacks may be reduced to **4.5m** for small (mature tree height up to 7.5m) and medium size trees (mature tree height 7.5m-14m) provided all of the following six conditions are met:

1. The modified plasticity index of the soil between the underside of footing (USF) and a depth of 3.5m generally does not exceed 40%. This corresponds to soils with low/medium potential for soil volume change. Clay soils that exceed the 40% plasticity index are considered to have high potential for soil volume change. For these worst-case soils, the setbacks and tree planting restrictions remain unchanged from the 2005 Clay Soils Policy (tree setback must equal the mature height of the tree – i.e. 7.5m setback for small trees).

2. The USF is 2.1m or greater below the lowest finished grade. Note: this footing level must be satisfied for footings within 10m of the tree, as measured from the centre of the tree trunk, and verified by means of the Grading Plan as indicated in the Procedural Changes below.

3. A **small** size tree must be provided with a minimum of **25m^3** of available soil volume, as determined by a Landscape Architect. A **medium** size tree must be provided with a minimum of **30m^3** of available soil volume, as determined by a Landscape Architect. The developer will ensure the soil is generally uncompacted when backfilling in street tree planting locations.

   Note: the soil volume calculation must be based on a depth of 1.5m below finished grade (e.g. 5m length x 4m width at surface x 1.5m depth = 30m^3). It may include lands in the right-of-way and on private property, but must subtract the volume of shallow utility trenches (i.e. volume of shallow utility trenches cannot count towards minimum soil volume).

4. The tree species must be small to medium size, as confirmed by a Landscape Architect in the Landscape Plan.

5. The foundation walls are to be reinforced at least nominally (minimum of two upper and two lower 15M bars in the foundation wall) to provide ductility as described in the Geotechnical Report.

6. Grading surrounding the tree must promote draining to the tree root zone (in such a manner as not to be detrimental to the tree), as noted on the subdivision Grading Plan.

Procedural Changes Required to Implement the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines:

In areas of clay soils, the following procedures and conditions are to be followed for new plans of subdivision:

Tests

- One Atterberg Limits test and one water content test on 150 metre spacing (closer spacing where there are variations in soil composition, topography, etc.) and a grain size test for every four boreholes.
- One shrinkage test per subdivision.

Grading Plan

- The USF depth will be verified by means of the grading plan.
- The subdivision grading plan will promote draining to the tree root zone (in such a manner as not to be detrimental to the tree) and be noted in a drawing as part of the Grading Plan.

Geotechnical Reports

- Reinforcement of foundation walls will be confirmed by the Geotechnical Report. In any SMC soils, foundation walls are to be reinforced at least nominally, with a minimum of two upper and two lower 15M (rebar size) bars in the foundation wall.
- A Geotechnical Engineer will provide a separate section within the Geotechnical Report on Sensitive Marine Clay soils, which includes a signed letter and corresponding map that confirms the locations of low/medium and/or high sensitivity clay soils, as determined by the plasticity tests (referenced above under Guideline 1).
- The Geotechnical Report with signed letter and map will be provided to the Landscape Architect prior to preparation of the Landscape Plan in order to inform details of the Landscape Plan.
- The Geotechnical Report with signed letter and map will be circulated by the City Planner file lead, with the Landscape Plan, to Forestry staff and the Planning Foresters for review in conjunction with the Landscape Plan. This must be completed prior to registration of the subdivision agreement.

Landscape Plan

- A Landscape Architect will develop a Landscape Plan that is consistent with the information and recommendations provided in the Geotechnical Report to the satisfaction of the Planning, Infrastructure and Economic Development Department and Forestry Services. The Landscape Plan shall include a note indicating that is has been developed as per the Geotechnical Report (date, author), the letter (date, author), and Map (date, title).
- At the time of tree planting, in addition to providing an F1 inspection form, the Landscape Architect will provide a signed letter indicating that trees are of small or medium size and have been planted with appropriate soil volume, as noted in Guidelines #3 and #4 above.

Minimum Number of Trees per Plan of Subdivision

- In areas of low/medium plasticity SMC soils (modified plasticity index generally does not exceed 40%), the minimum number of trees that must be provided in a plan of subdivision will be one tree per lot, and two per corner lot, with the following exceptions that intend to maximize the number of medium size trees that can be planted:
    - Where abutting properties form a continuous greenspace between driveways (i.e. many townhouse and semi-detached dwellings; some detached dwellings where driveways are on opposite sides of the house) one medium size tree will be planted instead of two smaller sized trees, provided the minimum recommended soil volume can be achieved. In these cases only, for the purpose of determining the minimum number of trees in a plan of subdivision, one medium size tree that is replacing two small trees will be "counted" as two trees.
    - The medium size tree should be planted as close as possible to the middle of this continuous greenspace (in the right-of-way) to maximize available soil volume.
    - On larger lots with sufficient soil volume for a medium size tree, one medium size tree will be planted on each lot (or each side of a corner lot), even if abutting properties form a continuous greenspace between driveways.

Subdivision Conditions

The following details are intended to assist file leads with the writing of new draft plan of subdivision conditions to support the implementation of the Tree Planting in Sensitive Marine Clay Soils - 2017 Guidelines:

- City of Ottawa Forestry staff will:
    - Review the Geotechnical Report and prepare and approve any direction to homeowners regarding tree watering or surface permeability in proximity to trees.
    - Notify homeowners that trees on City property will be subject to City tree maintenance programs for pruning and other maintenance.
    - Provide file leads with the appropriate Subdivision Conditions prior to registration.
- In areas of low/medium plasticity SMC soils (modified plasticity index generally does not exceed 40%):
    - The minimum number of trees that must be provided in a plan of subdivision will be one tree per lot, and two per corner lot, except where abutting properties form a continuous greenspace between driveways. In these cases, one medium size tree will be planted instead of two small size trees, provided the minimum $30m^3$ of soil volume can be achieved. In these cases only, for the purpose of determining the minimum number of trees in a plan of subdivision, one medium size tree that is replacing two small trees will be "counted" as two trees.
    - The medium size tree should be planted as close as possible to the middle of this continuous greenspace (in the right-of-way) to maximize available soil volume.
    - On larger lots with sufficient soil volume for a medium size tree, one medium size tree will be planted on each lot (or each side of a corner lot), even if abutting properties form a continuous greenspace between driveways.
    - Where medium size trees cannot be planted because of high plasticity clay soils, small trees shall be planted at one tree per lot.
    - If trees need to be replaced, Forestry staff reserve the right to plant appropriate size trees at one tree per lot.

DESCRIPTIONS OF WORKS

Caivan (Mer-Bleue) Inc.
2934 Baseline Road
Suite 302
Ottawa, ON
K2H 1B2

Cassette Subdivision – 2275 Mer-Bleue Road
Cumberland Ward

The establishment of wastewater infrastructure Works located in the Cumberland Ward, consisting of the following:

- **sanitary sewers:** on Ryan Reynolds Way (from Station 0+510.00 to 0+150.00); on Broadcast Avenue (from Station 0+020.00 to 0+120.00); on Scuplin Street (from Station 0+060.00 to 0+010.00); all discharging to existing sewers located at the Minto Avalon Development and ultimately to the Tenth Line Road Pump Station.
- **storm sewers** on Ryan Reynolds Way (from Station 0+510.00 to 0+150.00); on Broadcast Avenue (from Station 0+020.00 to 0+120.00); on Scuplin Street (from Station 0+060.00 to 0+010.00); all discharging to existing sewers located at the Minto Avalon Development and ultimately to the Avalon West (Neighborhood 5) Stormwater Management Pond Expansion;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;
all in accordance with the submitted application and supporting documents listed in Schedule A forming part of this Approval.

The establishment of stormwater management Works to serve the Cassette Subdivision development, for the collection, transmission, treatment and disposal of stormwater runoff from a total catchment area of 4.04-hectares, to provide erosion control, enhanced quality control through will be achieved in the existing Avalon West (N5) SWM Facility and to attenuate post-development peak flows to pre-development peak flows for all storm events up to and including the 100-year storm event, discharging existing roadside ditches consisting of the following:

- **stormwater management facility (catchment area 4.04 hectares):** Proposed storm sewers collect flows from the subdivision and discharge to the existing Minto Avalon Development and Avalon West (N5) SWM Facility (ECA #6142-BEJHCE, dated August 1, 2019), which is an existing tributary watercourse of McKinnon Creek. The related ECA's for Stage 5 and Stage 6 of the Minto Avalon Development are ECA #0606-AHXJCH (dated February 2, 2017) and ECA #8605-AYUHJG (dated May 30, 2018), respectively.

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule A forming part of this Approval.

TERMS AND CONDITIONS FOR WORKS

Definitions:

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

3. "District Manager" means the District Manager of the appropriate local District Office of the Ministry, where the Works are geographically located;

4. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended;

5. "Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of the approved named equipment;

6. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

7. "MNRF" means the Ministry of Natural Resources and Forestry of the government of Ontario and includes all officials, employees or other persons acting on its behalf;

8. "Owner" means Caivan (Greenbank North) Inc., and includes {its/her/his/their} successors and assignees;

9. "OWRA" means the *Ontario Water Resources Act, R.S.O. 1990, c. O.40*, as amended;

10. "Works" means the sewage works described in the Owner's application, and this Approval.

Terms and Conditions:

1. GENERAL CONDITIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

4. Where there is a conflict between the documents listed in Schedule A and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

5. The conditions of this Approval are severable. If any condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

2. In the event that completion and commissioning of any portion of the Works is anticipated to be delayed beyond the specified expiry period, the Owner shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of Approval of the Works are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of Owner;

    b. change of address of the Owner;

c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act,* R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or

d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act,* R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

3. The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

5. TEMPORARY EROSION AND SEDIMENT CONTROL

1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

6. RECORD KEEPING

1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation, maintenance and monitoring activities required by this Approval.

Schedule A forms part of this Approval and contains a list of supporting documentation / information received, reviewed and relied upon in the issuance of this Approval.

Schedule A

1. Application for Environmental Compliance Approval, dated 2022/08/17, received on 2022/08/17, submitted by Caivan (Greenbank North) Inc.;
2. Transfer of Review Letter of Recommendation, dated 2022/08/17 and signed by Natasha Baird, P.Eng., Senior Engineer, Development Review, City of Ottawa;
3. Design Brief for Cassette Subdivision (2275 Mer-Bleue Road), prepared by David Schaeffer Engineering Limited, 2nd Submission, dated June, 2022
4. Engineering Drawings, prepared by David Schaeffer Engineering Limited, revision 3, dated 22/06/29.
5. Pipe Data Form (PIBS 6238e)
6. Storm Sewer Description Sheet
7. Sanitary Sewer Description Sheet
8. Environmental Compliance Approval No.6142-BEJHCE, August 1, 2019
9. Environmental Compliance Approval No.7375-A8QGEU, April 12, 2016
10. Environmental Compliance Approval No.0606-AHXJCH, February 2, 2017
11. Environmental Compliance Approval No.8605-AYUHJG, May 30, 2018
12. Stormwater Management Report for Cassette Subdivision, 2275 Mer-Bleue Road, prepared by J.F. Sabourin and Associates, dated June 2022.
13. Draft Plan Conditions
14. M-Plan prepared by J.D. Barnes dated plotted March 15, 2022
15. Articles of Incorporation
16. Zoning Map
17. Location Plan
18. Operating Authority Contact Information;
19. Environmental Bill of Rights Form dated June 29, 2022;
20. Sourcewater Protection Map
21. South Nation Conservation Authority Consultation
22. Cheque in the amount of $1,100.00 made out to the City of Ottawa

Reasons:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included to prevent the operation of stormwater pipes and other conveyance until such time that their required associated stormwater management Works are also constructed.

5. Condition 5 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.

6. Condition 6 is included to require that all records are required for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

File Number: D07-16-21-0001

Date: August 17, 2022

Supervisor, Applications Review Unit
Client Services and Permissions Branch
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto ON
M4V 1P5

Dear: Sir/Madam

Subject: **Cassette Subdivision – 2275 Mer-Bleue Road**
Part of Lots 2 and 3, Concession 11 (Geographic Township of Cumberland
Submitted Under Transfer of Review (ToR) Agreement No. TOR-OTT-E-2019-01 for the City of Ottawa

This letter of recommendation along with the other documents in the application package have been submitted in support of recommending an Environmental Compliance Approval (ECA) for the above-noted project. The recommendationis based on the following technical assessment of the project.

The applicant, Caivan (Mer Bleu) Inc., has applied for an Environmental Compliance Approval for the Works described below.

Based on the above-noted information an assessment of the project was conducted with the following results:

Project Summary/Eligibility for Transfer of Review Program

Installation of new sanitary and storm sewers, including erosion control measures, and all related appurtenances to service the proposed Cassette Subdivision located at 2275 Mer-Bleue Road in the Cumberland Ward.

Proposed sanitary sewers will connect to an existing 200 mm diameter sanitary sewers within the existing Minto Avalon Development area and tributary to the Tenth Line Road Pump Station (ECA #7375-A8QGEU, April 12, 2016).

Proposed storm sewers collect flows from the subdivision and discharge to the existing Minto Avalon Development infrastructure which is tributary to the Avalon West (Neighborhood 5) Stormwater Management Pond Expansion (ECA #6142-BEJHCE, dated August 1, 2019).

The related ECA's for Stage 5 and Stage 6 of the Minto Avalon Development are ECA #0606-AHXJCH (dated February 2, 2017) and ECA #8605-AYUHJG (dated May 30, 2018), respectively.

Enhanced Level Quality Control (80% total suspended solids removal) will be achieved in the existing Avalon West (N5) SWM Facility.

The works are eligible for review under the ToR program because they consist of proposed sanitary and storm which all discharge to existing municipal infrastructure. The works are all designed in accordance with the Ministry's Design Guidelines for Sewage Works (2008).

Documentation Reviewed

The Municipality's assessment of the works was based on the following information:

1. Application for Environmental Compliance Approval, dated 2022/08/17 submitted by Caivan (Mer Bleu) Inc.;
2. Design Brief for Cassette Subdivision (2275 Mer-Bleue Road), prepared by David Schaeffer Engineering Limited, 2nd Submission, dated June, 2022
3. Engineering Drawings, prepared by David Schaeffer Engineering Limited, revision 3, dated 22/06/29.
4. Pipe Data Form (PIBS 6238e)
5. Storm Sewer Description Sheet
6. Sanitary Sewer Description Sheet
7. Environmental Compliance Approval No.6142-BEJHCE, August 1, 2019
8. Environmental Compliance Approval No.7375-A8QGEU, April 12, 2016
9. Environmental Compliance Approval No.0606-AHXJCH, February 2, 2017
10. Environmental Compliance Approval No.8605-AYUHJG, May 30, 2018
11. Stormwater Management Report for Cassette Subdivision, 2275 Mer-Bleue Road, prepared by J.F. Sabourin and Associates, dated June 2022.
12. Draft Plan Conditions
13. M-Plan prepared by J.D. Barnes dated plotted March 15, 2022
14. Articles of Incorporation
15. Zoning Map
16. Location Plan
17. Operating Authority Contact Information;
18. Environmental Bill of Rights Form dated June 29, 2022;
19. Sourcewater Protection Map
20. South Nation Conservation Authority Consultation
21. Cheque in the amount of $1,100.00 made out to the City of Ottawa

Fees Received

Transfer of Review fee collected by certified cheque, $1,100.00, paid to the City of Ottawa

Regulatory Requirements

The works are considered a prescribed instrument under the Environmental Bill of Rights but are exempt from requirements as they have undergone substantially equivalent process of public participation. The proposed works have fulfilled the EAA requirements through a Class EA Schedule B process. Duty to Consult does not apply to this project.

Technical Criteria Used to Assess the Application

1. Ministry's Design Guidelines for Sewage Works, 2008 (PIBS 6879);
2. Stormwater Management Planning and Design Manual, 2003 (PIBS 4329e);
3. City of Ottawa Sewer Design Guidelines Second Edition, October 2012 and design criteria;
4. City of Ottawa Technical Bulletin PIEDTB-2016-01
5. City of Ottawa Technical Bulletin ISTB-2018-04
6. City of Ottawa Technical Bulletin ISTB-2019-02
7. Quantity controls within the development will be provided via inlet control devices (ICDs) appropriately sized to control inflows into the minor system to 220 L/s/ha as defined in the approved stormwater management report for the adjacent Avalon West (N5) development. Overall quantity controls (post-development to pre-development levels of peak flows for all storm events up to and including the 100-year storm event) for the catchment area will be provided by the existing Avalon West (N5) SWM Facility (Ministry ECA No 6142-BEJHCE (dated August 1, 2019)).
8. Quality controls are not required within the development parcel. Enhanced Level Quality Control (80% total suspended solids removal) will be achieved within the existing downstream Avalon West (N5) SWM Wet Facility.

Source Water Protection

The MECP source water protection mapping indicates that the site is located outside of the Rideau Valley source protection area. The proposed works are not located in highly vulnerable aquifers areas. According to the Ministry's website http://www.applications.ene.gov.on.ca/swp/en/ the proposed works are not expected to be considered a significant drinking water threat and will not require additional risk assessment.

Stormwater Works Project Timing/Relationship to Other Works

A review of the application information confirms that any additional stormwater quantity and/or quality control for the stormwater to be collected by the proposed storm sewers and conveyance in the application will be provided by existing stormwater management

works consisting of a wet stormwater management facility servicing a 255.90 hectare catchment area, providing Enhanced Level water quality protection and erosion control, and to attenuate post-development peak flows to pre-development peak flows for all storm events up to and including the 100-year storm event and located within Part of Lot 4, Concession 11 (Cumberland) in the City of Ottawa and approved by Ministry ECA No 6142-BEJHCE (dated August 1, 2019).

Confirmation of Clearance with the local Ministry District Office, Conservation Authority, Other Agencies

Consultation was undertaken as per letter dated February 24, 2021, from the South Nation Conservation.

The local Ministry District Office is copied on this submission package as this application is for standard works.

Final Recommendation/Confirmation by Review Engineer

I confirm that I did not design nor certify the proposed works for this project. Based upon the assessment described above, I am recommending that the project be granted an ECA by the Ministry of the Environment, Conservation and Parks.

For further information, please contact Kevin Murphy at DSEL by e-mail at kmurphy@DSEL.ca or by telephone at 613-324-8361, or Natasha Baird at the City of Ottawa at natasha.baird@ottawa.ca.

Sincerely,

Natasha Baird, P.Eng., PEO license No. 100072919
Senior Engineer - Infrastructure Applications
Development Review, East Branch
Planning Services
Planning, Real Estate & Economic Development Department

c.c. Tracy Hart, District Manager, MECP Ottawa District Office
Peter McKay, Infrastructure Renewal Program Manager, Infrastructure Assessment - Water Resources Assets Unit (MC 26-61) (letter only)
Alex Polyak. Project Manager, East Branch
Geraldine Wildman, Manager, Development Review, East Branch
Hugo Lalonde, Director Land Development , Caivan (Mer Bleu) Inc. (letter only)
Kevin L Murphy, P.Eng., Project Manager, David Schaeffer Engineering (letter only)

Enclosures(9).

MINISTRY OF THE ENVIRONMENT, CONSERVATION AND PARKS
TRANSFER OF REVIEW PROGRAM APPLICATION SUBMISSION CHECKLIST

This Checklist must be completed for all applications submitted under the Transfer of Review (ToR) program. Application packages will not be accepted unless ALL of the parts of the Checklist are filled in and all required supporting documentation is submitted to the Ministry.

APPLICANT REQUIREMENTS

The Municipality must confirm if the following documents or requirements were completed by th4e applicant and include them in the application package to the Ministry (if applicable). Incomplete applications will be returned to the Municipality.

Project Title: Cassette Subdivision (2275 Mer-Bleue Road)

Project is for (check all that apply):

Sanitary sewers ☒, forcemains ☐, siphons ☐; or sanitary pumping stations ☐.
Stormwater sewers ☒, ditches ☐, culverts ☐, grassed swales ☐; or oil/grit separators ☐;

Wet pond ☐, wetland ☐, dry pond ☐, hybrid wetpond/wetland ☐, stormwater pumping stations ☐
Green roofs ☐, soakaways, infiltration trenches and chambers ☐, bioretention ☐, vegetated filter strips ☐,
Permeable pavement ☐, enhanced grassed swales ☐, dry swales (bioswales) ☐, perforated pipe systems ☐
Rooftop/Surface/Underground Storage ☐
Others (please specify):

	YES	NO	N/A
Completed MOECC Application for an Environmental Compliance Approval	☒	☐	☐
Application signed and dated by proponent	☒	☐	☐
Application signed and dated by other interested parties (e.g. Municipality,	☒	☐	☐
Proof of legal name: Articles of Incorporation or other applicable documents if applicant is a Corporation; or birth certificate or passport if applicant is a person	☒	☐	☐
Development Permit: Under section 24(3) of the *Niagara Escarpment Planning and Development Act*, it is illegal to issue an Environmental Compliance Approval unless a "Development Permit" has been issued for the	☐	☐	☒
Design report (if the application is for stormwater works, a Stormwater Management	☒	☐	☐
Drawings signed, stamped and dated by a Professional Engineer	☒	☐	☐
Completed Ministry Pipe Data Form (PIBS 6238e)[1]	☒	☐	☐
If the application is for a sewage pumping station, contingency plans for emergency and pump failure situations	☐	☐	☒
If the application is for a forcemain or siphon, contingency plans for possible overflows	☐	☐	☒
Confirmation that pre-application consultation with the Local Ministry District Office was done:	☐	☐	☒
Confirmation that Environmental Assessment Act requirements are fulfilled? Exempt ☐; Class EA ☐; Other ☐ (include rationale) Schedule [A A+ B C] (circle one) and Paragraph: __ • If Schedule B applies, include a copy of the Notice of Completion; and • If Schedule C applies, include a copy of the Notice of Completion and evidence that the Environmental Study Report was completed.	☒	☐	☐

1 This form is required if the proposed works include sanitary sewers, forcemains, sewage pumping stations, or stormwater sewers.

Confirmation whether Environmental Bill of Rights (EBR) requirements apply	☒	☐	☐
Public consultation on the project. • If yes, include summary of all public consultation; • If no or N/A, provide rationale	☒	☐	☐
Confirmation whether Duty to Consult requirements have been met	☐	☐	☒
If the works are to be constructed on land that is not owned by the applicant, proof of consent has been obtained from the owner of the land, allowing construction of the works	☐	☐	☒
If the stormwater works discharge to a surface water body, confirmation that the local Conservation Authority OR MNRF District Office was consulted	☐	☐	☒
If the stormwater works discharge to a location or works that are not owned by the applicant, proof of consent has been obtained from the owner of the receiving works	☐	☐	☒
If the proposed works are in an area where they are considered a significant threat to sources of drinking water (Y/N)[2]: • If yes, the Source Protection Supplementary Report/Information should outline how the proposed works will be managed to mitigate the contamination of sources of drinking water through the construction, design and operation of the proposed activity • If no, the Source Protection Supplementary Report should outline details to support this conclusion	☐	☐	☒
List any other applicant documents included in the submission to the Ministry as separate attachments to this			

MUNICIPALITY REQUIREMENTS

The Municipality must confirm that they have completed the following documents or requirements. All documents noted below MUST be submitted. Incomplete applications will be returned to the Municipality.

	YES	NO	N/A
Completed the Letter of Recommendation meeting the following requirements?	☒	☐	☐
• Confirms that the design is in accordance with the Ministry "Design Guidelines for Sewage Works, 2008" and/or the "Stormwater Management Planning and Design Manual, 2003"	☒	☐	☐
• Includes the fee amount that was received by the Municipality.	☒	☐	☐
• If the application is for stormwater works, includes description of water quantity and quality criteria that were established for the project and confirmation that the criteria were agreed to by relevant agencies	☐	☐	☒
• If the application is for storm sewers or other stormwater conveyance, confirms that necessary stormwater management facilities are in place or will be constructed and in operation in the same timeframe as the sewers or conveyance OR interim measures will be provided to meet water quantity or	☒	☐	☐
• Confimation that a copy of the draft ECA was submitted to the local Ministry District Office	☐	☐	☒

[2]Works under the ToR program may be a significant threat when according to Tables of Drinking Water Threats, they occur in a protection zone around municipal systems under the following circumstances. The Source Water Protection Map can be found at: http://www.applications.ene.gov.on.ca/swp/en/

- Wellhead Protection Area (WHPA) A-D with a vulnerability score of 10
- Wellhead Protection Area (WHPA) E and/or Intake Protection Zones (IPZ) 1, 2 or 3 with a vulnerability score of 8 or higher
- Issues contributing area for chloride, nitrate or phosphorus

• Confirms that clearance from the local Conservation Authority or MNRF, as required, has been obtained	☒	☐	☐
• For drainage works under the *Drainage Act*, confirms that approval of the petition under the *Drainage Act* has been obtained, as applicable	☐	☐	☒
• Confirms that the works are not considered a significant drinking water	☐	☐	☒
• If the sewage works is a significant drinking water threat, confirms that the works have been reviewed by the Municipality in accordance with the *Clean Water Act*, 2006 and the applicable policies of the local Source Protection Plan. The review has determined that the activity will no longer pose a significant threat to drinking water as a result of the measures identified by the proponent and with appropriate terms and conditions, if approved	☐	☐	☒
• Confirms that the requirements of the Environmental Assessment Act, the Environmental Bill of Rights and/or the Duty to Consult have been met or that they do not apply	☒	☐	☐
• Confirms that the Municipality's Review Engineer is an employee of the Municipality with authority to review applications for an ECA	☒	☐	☐
• Confirms that the Municipality's Review Engineer did not design the works in the application	☒	☐	☐
• Confirms that the Letter of Recommendation is signed and dated by the Review Engineer and includes their PEO licence number	☒	☐	☐
Any additional documents required for Additional Works	☐	☐	☒
Has the Municipality provided a draft ECA including the description of the works, and terms and conditions to be included in the ECA?	☒	☐	☐
List any other applicant documents included in the submission to the Ministry as separate attachments to this checklist.			

Natasha Baird

2022-Aug-17

Date

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 1079-CHNKX4
Issue Date: September 1, 2022

Caivan (Mer Bleu) Inc.
2934 Baseline Road, Suite 302
Ottawa, Ontario
K2H 1B2

Site Location: Cassette Subdivision
2275 Mer-Bleue Road
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the establishment of wastewater infrastructure Works located in the City of Ottawa, consisting of the following:

- **sanitary sewers** on Ryan Reynolds Way (from Station 0+510.00 to Station 0+150.00), Broadcast Avenue (from Station 0+020.00 to Station 0+120.00), and Sculpin Street (from Station 0+060.00 to Station 0+010.00), all discharging to existing sewers located at the Minto Avalon Development and ultimately to the Tenth Line Road Pump Station;

- **storm sewers** on Ryan Reynolds Way (from Station 0+510.00 to Station 0+150.00), Broadcast Avenue (from Station 0+020.00 to Station 0+120.00), and Sculpin Street (from Station 0+060.00 to Station 0+010.00), all discharging to existing sewers located at the Minto Avalon Development and ultimately to the Avalon West (Neighborhood 5) Stormwater Management Pond Expansion;

the establishment of stormwater management Works to serve the Cassette Subdivision development, located in the City of Ottawa, for the collection, transmission, treatment and disposal of stormwater runoff from a total catchment area of 4.04 hectares, to attenuate post-development peak flows to allowable peak flows for all storm events up to and including the 100-year storm event, discharging to existing storm sewers consisting of the following:

- **rooftop or surface storage (catchment area 4.04 hectares),** located within the Ryan Reynolds, Broadcast Avenue and Sculpin Street right-of-ways, having a maximum available storage volume of 198 cubic metres and a maximum ponding depth of 260 millimetres, discharging via catchbasin storm leads equipped with either 83, 94, 102, 108, 127, or 152 millimetre diameter inlet control devices, allowing a maximum discharge of 741 litres per second under the 100-year storm event to existing storm sewers located within the Aquarium Avenue right-of-way;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

3. "District Manager" means the District Manager of the appropriate local District Office of the Ministry, where the Works are geographically located;

4. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended;

5. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

6. "Owner" means Caivan (Mer Bleu) Inc., and includes its successors and assignees;

7. "OWRA" means the *Ontario Water Resources Act, R.S.O. 1990, c. O.40* , as amended;

8. "Works" means the sewage Works described in the Owner's application, and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

4. Where there is a conflict between the documents listed in Schedule "A" and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

5. The conditions of this Approval are severable. If any condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

2. In the event that completion and commissioning of any portion of the Works is anticipated to be delayed beyond the specified expiry period, the Owner shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of Approval of the Works are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

a. change of Owner;

b. change of address of the Owner;

c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act,* R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or

d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act,* R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

3. The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

2. The Owner shall make all necessary investigations, take all necessary steps and obtain all necessary approvals so as to ensure that the physical structure, siting and operations of the Works do not constitute a safety or health hazard to the general public.

3. The Owner shall undertake an inspection of the condition of the Works, at least once a year, and undertake any necessary cleaning and maintenance to ensure that sediment, debris and excessive decaying vegetation are removed from the Works to prevent the excessive build-up of sediment, oil/grit, debris and/or decaying vegetation, to avoid reduction of the capacity and/or permeability of the Works, as applicable. The Owner shall also regularly inspect and clean out the inlet to and outlet from the Works to ensure that these are not obstructed.

4. The Owner shall construct, operate and maintain the Works with the objective that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen, foam or discoloration on the receiving waters.

5. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Owner's administrative office for inspection by the Ministry. The logbook shall include the following:

   a. the name of the Works; and

   b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed and method of clean-out of the Works.

6. The Owner shall prepare an operations manual prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information:

   a. operating and maintenance procedures for routine operation of the Works;

   b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

   c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;

   d. contingency plans and procedures for dealing with potential spills and any other abnormal situations and for notifying the District Manager; and

   e. procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

7. The Owner shall maintain the operations manual current and retain a copy at the Owner's administrative office for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

5. TEMPORARY EROSION AND SEDIMENT CONTROL

1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

6. REPORTING

1. One (1) week prior to the start-up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start-up date.

2. The Owner shall, upon request, make all reports, manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

3. The Owner shall prepare a performance report within ninety (90) days following the end of the period being reported upon, and submit the report(s) to the District Manager when requested. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be prepared to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

    a. a description of any operating problems encountered and corrective actions taken;

    b. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works;

    c. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

    d. a summary of all spill or abnormal discharge events; and

    e. any other information the District Manager requires from time to time.

7. RECORD KEEPING

1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation, maintenance and monitoring activities required by this Approval.

Schedule "A"

1. Application for Environmental Compliance Approval, dated August 17, 2022 and received on August 17, 2022, submitted by Caivan (Mer Bleu) Inc.;

2. Transfer of Review Letter of Recommendation, dated August 17, 2022 and signed by Natasha Baird, P.Eng., Senior Engineer, Development Review, City of Ottawa, including the following supporting documents:

   a. Final Plans and Specifications prepared by David Schaeffer Engineering Limited.

   b. Pipe Data Form - Watermain, Storm Sewer, Sanitary Sewer, and Forcemain Design Supplement to Application for Approval for Water and Sewage Works.

   c. Hydraulic Design Sheets prepared by David Schaeffer Engineering Limited.

   d. Stormwater Management Report prepared by David Schaeffer Engineering Limited.

3. Email received on August 25, 2022 from Natasha Baird, City of Ottawa

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from the Works are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the Works. The Condition also ensures that adequate storage is maintained in the Works at all times as required by the design. Furthermore, this Condition is included to ensure that the Works are operated and maintained to function as designed.

5. Condition 5 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.

6. Condition 6 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

7. Condition 7 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me and the Ontario Land Tribunal within 15 days after receipt of this notice, require a hearing by the Tribunal. Section 142 of the *Environmental Protection Act* provides that the notice requiring the hearing ("the Notice") shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5
OLT.Registrar@ontario.ca

and

The Director appointed for the purposes of
Part II.1 of the *Environmental Protection Act*
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the *Environmental Protection Act.*

DATED AT TORONTO this 1st day of September, 2022

A. Ahmed

Aziz Ahmed, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

RR/

c: District Manager, MECP Ottawa District Office
Clerk, City of Ottawa (File No. D07-16-21-0001)
Natasha Baird, P. Eng., Senior Enginer, Development Review, City of Ottawa
Kevin Murphy, David Schaeffer Engineering Ltd.

Ontario

Ministry of the Environment and Climate Change

Environmental Compliance Approval Application

Table of Contents

© Queen's Printer for Ontario, 2019

Environmental Compliance Approval Application

General Information and Instructions

General Information

Information requested in this form is collected under the authority of the *Environmental Protection Act* (EPA), *Ontario Water Resources Act* (OWRA) and Environmental Bill of Rights (EBR), and will be used to evaluate applications for Environmental Compliance Approvals (ECAs) issued under Part II.1 of the EPA. This application form should not be used for mobile PCB destruction facilities.

For all questions related to preparing or submitting this form or about the Ministry's collection of information related to applying for an ECA, contact:

Client Services and Permissions Branch
135 St. Clair Ave. West, 1st Floor
Toronto Ontario M4V 1P5
Telephone outside Toronto 1-800-461-6290 or in Toronto 416-314-8001.

Instructions

1. Applicants are responsible for ensuring that they complete the most recent application form. Application forms and information about the required supporting documentation and technical requirements are available from the Client Services and Permissions Branch (the address and phone number are provided in the General Information on this page). As well, you can get this information from your local District Office of the Ministry of the Environment and Climate Change, and online at: https://www.ontario.ca/page/environmental-approvals
2. A complete application consists of:
   - a completed and signed application form;
   - all required supporting documents and technical requirements identified in:
     i. this form,
     ii. Ministry guidance,
     iii. the Applications for Environmental Compliance Approvals regulation, and
   - payment of the application fee (in Canadian funds) by certified cheque or money order made payable to the Minister of Finance, or credit card payment (for payments up to $10,000). For Transfer of Review, make the cheque or money order payable to the appropriate municipality. T**he Ministry may return or refuse incomplete applications to the applicant**. The Director may require additional information of any application initially accepted as complete.
3. Submit the complete application as follows:
   - One (1) paper copy (unless the application is a Transfer of Review), one (1) electronic copy and the fee to the Director, Client Services and Permissions Branch at the address provided in the General Information on this page.
   - If the application is a Transfer of Review, the applicant must submit two (2) copies of the completed application and the fee to the designated municipal authority.
4. The applicant must also send a copy of the application without the fee to the local Ministry District Office that has jurisdiction over the area where the facilities are located. DO NOT send payment to the District Office.
   - To locate the appropriate local Ministry District Office, visit the Ministry of the Environment and Climate Change website at: http://www.ontario.ca/environment-and-energy/ministry-environment-and-climate-change-regional-and-district-offices
5. For Waste Disposal Sites the applicant must also send a copy of the application without the fee to the Clerk's office of the local municipality (both upper and lower tier) in which the facility/proposed facility is located unless the application is for a revocation or an amendment that is environmentally insignificant or the applicant is a municipality. DO NOT send any payment information to the municipality.

 © Queen's Printer for Ontario, 2019

Information collected by the Ministry of the Environment and Climate Change is subject to the *Freedom of Information and Protection of Privacy Act (FIPPA)*. If the applicant is of the view that any part of the application is confidential on the grounds that such information constitutes a trade secret or scientific, technical, commercial, financial or labour relations information, please make this known now. Otherwise, the Ministry may make the information available to the public without further notice to the applicant.

It is an offence under the EPA and OWRA to provide false or misleading information in this application and/or accompanying documents.

Complete the sections as shown below.

- Section 1: Applicant Information
- Section 2: Project Information
- Section 3: Regulatory Requirements
- Section 4: Site Information
- Section 5: Facility Information
- Section 6: Supporting Documentation
- Section 7: Payment Information
- Section 8: Authorization

Fields marked with an asterisk (*) are mandatory.

1. Applicant Information

1.1 Applicant Information

Applicant Type *

☑ Corporation ☐ Individual ☐ Federal Government ☐ Municipal Government

☐ Partnership ☐ Provincial Government ☐ Sole Proprietor

☐ Other (specify) _____

Applicant Name (Legal name of individual or organization as evidenced by legal documents) *

Caivan (Mer Bleu) Inc.

☑ Select if Business Name same as Applicant Name

Business Name *

Caivan (Mer Bleu) Inc.

Business Number *	Business Website Address
2782682	

Primary North American Industry Classification System (NAICS) Code *

236110

Other NAICS Code

Separate list attached?

☐ Yes ☑ No

Business Activity Description

Land development

✓ Completion Status (1.1 Applicant Information)

1.2 Applicant Physical Address

Address Type? *

☑ Civic Address ☐ Survey Address

Civic Address

Unit Number	Street Number *	Street Name *
302	2934	Baseline road

Survey Address

Enter Lot and Concession or Part and Reference Plan

Lot	Concession	Part	Reference Plan

Municipality/Unorganized Township *	County/District	
Ottawa		

Province/State *	Country *	Postal/Zip Code *
Ontario	Canada	K2H 1B2

Telephone Number *	Fax Number	Mobile Number	Email Address *
613-295-5082 ext.			hugo.lalonde@caivan.com

Geo Reference

Description of location	Map Datum	Zone	Accuracy Estimate	Geo-Referencing Method	UTM Easting	UTM Northing
Southwest corner of property						
Physical location of front door or main entrance						

✓ Completion Status (1.2 Applicant Physical Address)

1.3 Applicant Mailing Address

☑ Select if same as Physical Address

Unit Number	Street Number *	Street Name *
302	2934	Baseline road

Delivery Designator	Delivery Identifier	Postal Station

Municipality/Unorganized Township *	County/District	
Ottawa		

Province/State *	Country *	Postal/Zip Code *
Ontario	Canada	K2H 1B2

Telephone Number *	Fax Number	Mobile Number	Email Address *
613-295-5082 ext.			hugo.lalonde@caivan.com

✓ Completion Status (1.3 Applicant Mailing Address)

2. Project Information

2.1 Project Name and Description

Project Name *

Cassette Subdivision - 2275 Mer-Bleue Road

Project Description Executive Summary *

Installation of new sanitary and storm sewers, including erosion control measures, and all related appurtenances to service the proposed Cassette Subdivision located at 2275 Mer-Bleue Road in the Cumberland Ward. Proposed sanitary sewers will connect to existing 200 mm diameter sanitary sewer stubs from Sculpin Street and Aquarium Drive that are within the existing Minto Avalon Development and ultimately conveyed to the Tenth Line Road Pump Station (ECA #7375-A8QGEU, April 12, 2016). Proposed storm sewers collect flows from the subdivision and discharge to the existing Minto Avalon Development infrastructure (975mm diameter sewer stubs from Sculpin Street and Aquarium Drive) which are tributary to the Avalon West (Neighborhood 5) Stormwater Management Pond Expansion (ECA #6142-BEJHCE, dated August 1, 2019). The related ECA's for Stage 5 and Stage 6 of the Minto Avalon Development are ECA #0606-AHXJCH (dated February 2, 2017) and ECA #8605-AYUHJG (dated May 30, 2018), respectively. Enhanced Level Quality Control (80% total suspended solids removal) will be achieved in the Avalon West (N5) SWM Facility.

Supplemental Application Information (select information button for required information for this field) *

Construction is anticipated to begin in August/September 2022.

✓ Completion Status (2.1 Project Name and Description)

2.2 Application Type

Type *

- [x] New ECA
- [ ] Amendment to existing ECA
- [ ] Revocation of existing ECA
- [ ] Administrative amendment to existing ECA
- [ ] Application for renewal of limited operational flexibility
- [ ] Consolidation of existing ECAs

Is this application for the addition of a new project type to the site or a new municipal waste category/class code to the waste management systems or a new sewage facility type?

- [ ] Yes
- [ ] No

Is this application for Transfer of Review? *

- [x] Yes
- [ ] No

✓ Completion Status (2.2 Application Type)

2.3 Project Type

Project Type (Select all that apply) *	Limited Operational Flexibility?	Pilot Project?
☐ Air - Stationary	☐	☐
☐ Air - Mobile	☐	☐
☐ Noise	☐	☐
☐ Vibration	☐	☐
☐ Waste Disposal Site - Landfill site	N/A	☐
☐ Waste Disposal Site - Transfer site	☐	☐
☐ Waste Disposal Site - Processing site	☐	☐
☐ Waste Disposal Site - Composting site	N/A	☐
☐ Waste Disposal Site - Thermal Treatment site	N/A	☐
☐ Sewage - Industrial	☐	☐
☑ Sewage - Municipal	☐	☐
☐ Sewage - Private	☐	☐
☐ Waste Management System – General Waste Management System	N/A	☐
☐ Waste Management System - Hauled Sewage (Septage)	N/A	☐
☐ Waste Management System – Soil Conditioner for transport to a site for Application on Land	N/A	☐
☐ Waste Management System - Mobile Waste Processing	N/A	☐
☐ Cleanup of contaminated sites - Mobile	N/A	☐
☐ Cleanup of contaminated sites - Site specific	N/A	☐

✓ Completion Status (2.3 Project Type)

2.4 Approval Information

Application initiated by *

☑ Applicant
☐ S. 20.18 Order (attach copy)
☐ Condition of existing approval
☐ Provincial Officer Order (attach copy)
☐ Inspection Report (attach copy)
☐ Other (specify) _____

Current Environmental Compliance Approvals that may be changed or amended by this application: ☑ N/A

Environmental Compliance Approval Number	Date of Issuance (yyyy/mm/dd)

Separate list attached?

☐ Yes ☑ No

Proposed Environmental Compliance Approvals related to this project: ☐ N/A

Project Type	Ministry Reference Number (if applicable)	Have Submitted	Have not Submitted
		☐	☐

Separate list attached?

☐ Yes ☑ No

✓ Completion Status (2.4 Approval Information)

2.5 Other Approval/Permits for Facility ☐ N/A

List all other instruments (approvals or permits) issued by the Ministry of the Environment and Climate Change or applied for under the *Environmental Protection Act*, *Environmental Assessment Act*, *Ontario Water Resources Act* and *Safe Drinking Water Act, 2002* and any Environmental Activity and Sector Registrations that are relevant to this application.

Instrument Type	Instrument Number/ Application Reference Number	Approval or Application Date (yyyy/mm/dd)
Sewage Municipal	ECA #6142-BEJHCE	2019/08/01
Sewage Municipal	ECA #7375-A8QGEU	2016/04/12
Sewage Municipal	ECA #0606-AHXJCH	2017/02/02
Sewage Municipal	ECA #8605-AYUHJG	2018/05/30

Separate list attached?

☐ Yes ☑ No

List all other instruments (approvals or permits) issued by an agency, municipality or another ministry that are relevant to this application.

Issuing Agency	Approval or Permit Name	Approval or Permit Number	Issued Date (yyyy/mm/dd)

Separate list attached?

☐ Yes ☐ No

✓ Completion Status (2.5 Other Approval/Permits for Facility)

2.6 Technical Contacts

Technical Contact 1

Area of Responsibility (Select all that apply) *

☐ Air ☐ Noise/Vibration ☑ Sewage ☐ Waste

Name of Technical Contact

Last Name *	First Name *
Murphy	Kevin

Company *
David Schaeffer Engineering Ltd.

Address Information

☐ Select if same as Applicant Mailing Address

Civic Address

Unit Number	Street Number *	Street Name *
103	120	Iber Road

Delivery Designator	Delivery Identifier	Postal Station

Municipality/Unorganized Township *	County/District
Stittsville	

Province/State *	Country *	Postal/Zip Code *
Ontario	Canada	K2S 1E9

Telephone Number *	Fax Number	Mobile Number	Email Address *
613-324-8361 ext.			kmurphy@dsel.ca

✓ Completion Status (2.6 Technical Contacts)

3. Regulatory Requirements

3.1 Environmental Bill of Rights (EBR) Requirements

Is this a proposal for a prescribed instrument under the EBR? *

☑ Yes ☐ No

If yes, is this proposal exempted from the EBR requirements? *

☑ Yes ☐ No

If yes, please check one of the following (Please provide supporting information.) *

☑ This proposal has been considered in a substantially equivalent process of public participation. (EBR, 1993, s.30.)

Was the public participation process carried out in fulfillment of the requirements related to an approval under the *Planning Act*? *

☑ Yes ☐ No

If yes, was the *Planning Act* approval related to a plan of subdivision? *

☑ Yes ☐ No

☐ This proposal is for an emergency situation. (EBR, 1993, s. 29.)

☐ This proposal is for an amendment to or revocation of an existing Environmental Compliance Approval that is not environmentally significant. (EBR, 1993, s. 22 (3).)

☐ This proposal has been subject to or exempted from EAA Requirements or considered in a decision of a tribunal. (EBR, 1993, s. 32.)

✓ Completion Status (3.1 Environmental Bill of Rights (EBR) Requirements)

3.2 *Environmental Assessment Act* (EAA) Requirements

Is the proposed undertaking subject to the requirements of the EAA? *

☑ Yes ☐ No

If yes, please select one of the following: *

☑ The proposed undertaking has fulfilled the requirements of the EAA through the completion of a Class EA process

Name of Class EA * Municipal Class EA

Schedule/Group/Category (if applicable) * Schedule A - Wastewater Management Projects #10

If applicable, please submit a copy of the proof of completion (for example, Notice of Completion).

Was the undertaking subject of a Part II Order request(s)? *

☐ Yes ☑ No

If yes, please submit a copy of the Director's or Minister's decision letter.

☐ The proposed undertaking has fulfilled all of the requirements for the EAA through:

Select all that apply:

☐ completion of an Environmental Screening Process pursuant to O. Reg. 101/07 of the EAA

☐ completion of an Environmental Screening Process pursuant to O. Reg. 116/01 of the EAA

Was the undertaking subject of an elevation request(s)?

☐ Yes ☐ No

If yes, please submit a copy of the Director's decision letter. If an appeal was made to the Director's decision, please also submit a copy of the Minister's decision letter.

☐ completion of an Environmental Screening Process pursuant to O. Reg. 231/08 of the EAA

Was the undertaking subject of an objection(s)?

☐ Yes ☐ No

If yes, please submit a copy of the Minister's decision letter.

☐ The proposed undertaking has fulfilled the requirements of the EAA through the completion of an individual Environmental Assessment.

Please submit a copy of the signed Notice of Approval.

Was the undertaking exempted from the requirements of the EAA? *

☐ Yes ☑ No

The proposed undertaking has fulfilled the requirements of the EAA through an exemption provided under:

Select one of the following

☐ Section _____ of Ontario Regulation No. _____ or

☐ Declaration/Exemption Order Number _____

If Regulation, Declaration Order or Exemption Order does not refer directly to this undertaking, please provide supporting documentation to explain why it applies to this facility

✓ Completion Status (3.2 *Environmental Assessment Act* (EAA) Requirements)

3.3 Consultation/Notification

Indigenous Consultation:

Is the proposed project/activity on Crown land or does/would it alter access to Crown land? *	☐ Yes ☑ No
Is the proposed project/activity in an open or forested area where hunting, trapping or plant gathering could occur? *	☐ Yes ☑ No
Does the proposed project/activity involve the clearing of forested land? *	☐ Yes ☑ No
Could the proposed project/activity impact a water body (e.g., direct discharge) or alter access to a water body? *	☐ Yes ☑ No
Could the proposed project/activity impact cultural heritage or archaeological resources, or access to them? *	☐ Yes ☑ No
Is the proposed project/activity adjacent or close to a First Nation Reserve? *	☐ Yes ☑ No
Is the applicant aware of any concerns from Indigenous communities about this proposed project/activity? *	☐ Yes ☑ No
Were there conditions placed, or direction provided, in another (or previous) permit or approval for consultation in relation to this project/activity? *	☐ Yes ☑ No
Based on the online Guide to Applying for an Environmental Compliance Approval, or direction provided by the ministry or another agency, are Indigenous consultation activities likely required as part of this application process? *	☐ Yes ☑ No

If Yes to the question above, please describe the consultation/notification activities undertaken for this application or as part of another process (e.g., EAA) in relation to the proposed project/activity, including a summary of the notification/ consultation, First Nation and Métis communities contacted, key issues raised and how they were addressed, any changes to the project as a result of these activities, and any planned consultation/notification activities in the future.

Please attach supporting documents (e.g., record of consultation, delegation letter and/or direction provided by the Crown, materials provided to communities, meeting notes and agendas, correspondence with communities as appropriate).

If the applicant has determined that consultation with First Nation and Métis communities is not likely required for the proposed project/activity, please provide a rationale why: *

Approval of the subdivision and proposed infrastructure have gone through the City of Ottawa's public participation processes required under the Planning Act. Specifically, public and agency consultation meetings regarding function servicing plans were held as part of the Planning Act approvals for the Draft Plan of Subdivison.

Other Consultation/Notification:

Has the applicant had a ministry pre-application consultation in relation to the proposed project? *

☐ Yes ☑ No

If this application is for a waste disposal site, have the neighbour notification requirements been completed?

☐ Yes ☐ No

If yes, please attach a Public Consultation/Notification Report that includes the notice and list of recipients.

If no, please select the reason for not undertaking neighbour notification:

☐ Application is for an administrative amendment

☐ The proposal was subject to public consultation through an Environmental Assessment process

☐ other , please explain _____

Are there any other consultation/notification activities that have been undertaken to fulfill requirements by other legislation or through voluntary efforts? *

☑ Yes ☐ No

If yes, please: *

1. describe the consultation/notification activities below; and
2. attach documents describing each of these consultation\notification activities, any changes to the project as a result of these activities and any planned consultation/notification activities in the future.

Development application under the Planning Act.

✓ Completion Status (3.3 Consultation/Notification)

4. Site Information

4.1 Site Address or Storage Location

Will the vehicles or equipment be stored at more than one location?

☐ Yes ☐ No

(If yes, please enter all vehicle or equipment storage locations below and attach separate list, as necessary.)

☐ Select if same as Applicant Physical Address

Address Type? *

☑ Civic Address ☐ Survey Address

Primary Civic Address

Unit Number	Street Number *	Street Name *
	2275	Mer-Bleue Road

Additional Civic Addresses

Unit Number	Street Number	Street Name

Separate list attached?

☐ Yes ☑ No

Primary Survey Address

Enter Lot and Concession or Part and Reference Plan

Lot	Concession	Part	Reference Plan

Additional Survey Address

Enter Lot and Concession or Part and Reference Plan

Lot	Concession	Part	Reference Plan

Separate list attached?

☐ Yes ☐ No

Municipality/Unorganized Township *	County/District	
Ottawa		
Province/State *	**Country ***	**Postal/Zip Code ***
Ontario	Canada	K4A 3P8

Non-address Information (includes any additional information to clarify the physical location)

Geo Reference (required)

☐ Select if same as Applicant Physical Geo Reference

Description of location	Map Datum *	Zone *	Accuracy Estimate *	Geo-Referencing Method *	UTM Easting *	UTM Northing *
Southwest corner of property	NAD83	18	+/- 5m	CAD	461,172.63	5,032,218.85
Physical location of front door or main entrance	NAD83	18	+/-5m	CAD	461,146.11	5,032,578.65

✓ Completion Status (4.1 Site Address or Storage Location)

4.2 Site or Storage Location Information

Site Name *
Cassette Subdivision

Days and Hours of Operation *	Ministry of the Environment and Climate Change District Office *
365 Days / 24hours/day	Ottawa District Office

Is the site (property) that is the subject of this application owned by the applicant? *

☑ Yes ☐ No

If no, please include the owner's name, address and a signed document indicating that the applicant has the authority to install and operate the proposed activity, or store vehicles or equipment on the land.

Is the applicant the operating authority of the site that is the subject of this application? *

☐ Yes ☑ No

If no, please include the operating authority name, address and phone number.

Is the site located in an area of development control as defined by the *Niagara Escarpment Planning and Development Act* (NEPDA)? *

☐ Yes ☑ No

If yes, please attach a copy of the NEPDA permit for proposed activity.

Is the site within an area covered by the Oak Ridges Moraine Conservation Plan? *

☐ Yes ☑ No

If yes, please attach proof of municipal planning approval for the proposed activity/work (for example, zoning by-law, letter from municipality, etc.).

✓ Completion Status (4.2 Site or Storage Location Information)

4.3 Site Zoning and Classification ☐ N/A

Current Land Use *	Official Plan Designation *	Current Zoning (Please attach zoning map, if available.) *
Vacant	General Urban	R3YY[2776], R3YY[2775]

Adjacent Land Use (select all that apply) *

☐ Industrial ☐ Agricultural ☐ Commercial ☐ Recreational ☑ Residential

☐ Other (specify) _____

Adjacent Land Zoning *
R3YY[2164], R3YY[2115], R3Z, DR, MC[1812]

Does the current zoning permit the proposed activity? *

☑ Yes ☐ No

Does the applicant have correspondence from the municipality to confirm that the current zoning of the property permits the proposed use? *

☐ Yes ☑ No If yes, please attach correspondence from the municipality.

Does the official plan designation support the proposed activity? *

☑ Yes ☐ No ☐ N/A

✓ Completion Status (4.3 Site Zoning and Classification)

4.4 Point of Entry into Ontario ☐ N/A

(for waste management system vehicles that are stored at an address outside of Ontario)

City in closest proximity to the point of entry

Description of Point of Entry

✓ Completion Status (4.4 Point of Entry into Ontario)

4.5 Source Protection/Drinking Water Threats (sewage or waste disposal site applications only) ☐ N/A

Check the source protection area(s) where the activity is/will be located *

☐ Ausable Bayfield	☐ Cataraqui Region	☐ Catfish Creek
☐ Central Lake Ontario	☐ Credit Valley	☐ Crowe Valley
☐ Essex	☐ Ganaraska	☐ Grand River
☐ Grey Sauble	☐ Halton	☐ Hamilton
☐ Kawartha-Haliburton	☐ Kettle Creek	☐ Long Point
☐ Lakehead	☐ Lake Simcoe and Couchiching/Black River	☐ Lower Trent
☐ Lower Thames Valley	☐ Maitland Valley	☐ Mattagami
☐ Mississippi Valley	☐ Niagara	☐ North Bay Mattawa
☐ Northern Bruce Peninsula	☐ Nottawasaga Valley	☐ Rideau Valley
☐ Raisin Region	☑ South Nation	☐ Saugeen Valley
☐ Sault Ste. Marie	☐ Severn Sound	☐ Sudbury
☐ St. Clair Region	☐ Toronto and Region	☐ Otonabee-Peterborough
☐ Outside a source protection area	☐ Quinte	☐ Upper Thames River

Is the proposed activity located or planned to be located in a vulnerable area identified in a local assessment report source protection plan under the *Clean Water Act, 2006*? *

☐ Yes ☑ No

If yes, what is/are the vulnerable area(s)/zone(s)?

☐ Wellhead Protection Areas ☐ Surface Water Intake Protection Zones ☐ Highly Vulnerable Aquifers

☐ Significant Groundwater Recharge Areas

Is the activity being applied for identified as a significant drinking water threat in the assessment report for the local source protection area? *

☐ Yes ☑ No

✓ Completion Status (4.5 Source Protection/Drinking Water Threats)

4.6 Receiver of Effluent Discharge (sewage applications only) ☐ N/A

Intermediate Receiver Name *

Existing storm sewer stubs (to Avalon West (N5) SWM Facility); Existing sanitary sewer stubs (Sculpin/Aquarium St)

Watershed Name *

McKinnon Creek

Type of Receiver *

☐ Surface Water ☐ Groundwater ☑ Other (specify) * Storm and sanitary sewers outlet to existing sewer stubs

Has the facility received local Conservation Authority clearance? (for stormwater management facility discharging to the natural environment) *

☑ Yes ☐ No

If yes, please include a copy of the Conservation Authority clearance.

Final Receivers ☑ N/A

Will the proposed activity discharge sewage to any of the following critical receivers?

☐ Lake Simcoe ☐ Rideau River ☐ Detroit River

☐ Great Lakes ☐ Rouge River ☐ Bay of Quinte

☐ Other (specify) _____

Is the receiver a Policy 2 receiver?

☐ Yes ☐ No

Does the applicant have a Policy 2 deviation approval from the directors?

☐ Yes ☐ No

If yes, please attach a copy of the Director's approval.

✓ Completion Status (4.6 Receiver of Effluent Discharge)

5. Facility Information

5.1 Air Note** - If the application does not have air emissions please proceed to Section 5.2 Information

5.1.1 Summary of Equipment that Discharges Contaminants to the Air

Select Type of Equipment	Number of Pieces of Equipment
☐ Combustion equipment that uses natural gas, propane, no. 2 oil, landfill gas or sewage treatment gas for fuel for the purpose of providing comfort heating or emergency power, producing hot water or steam, or heating material in a system that does not discharge to the atmosphere (Total Heat input of all units: ≤ 50,000,000 kJ/hr)	N/A
☐ Storage tanks	N/A
☐ Welding operations that use a maximum of 10 kilograms of welding rod per hour	N/A
☐ Combustion equipment that uses waste-derived fuel for the purpose of providing comfort heating, burning ≤ 15 litres per hour	
☐ Heat cleaning ovens used for parts cleaning and associated parts washers or degreasing equipment, other than solvent degreasing equipment	
☐ Cooling towers	
☐ Equipment used to control emissions of contaminants, other than a fume incinerator	
☐ Laboratory fume hoods	
☐ Paint spray booths and associated equipment that have a design capacity of up to 8 litres per hour of paint	
☐ Grain dryers	
☐ Any other equipment not listed above with a flow rate of less than or equal to 1.5 m^3/second	
☐ Any other equipment not listed above with a flow rate of greater than 1.5 m^3/second	
☐ Equipment that is subject to an Environmental Compliance Approval, and from which there is no proposed increase in the discharge of any contaminant that was previously reviewed by the Director.	N/A

✓ Completion Status (5.1.1 Summary of Equipment that Discharges Contaminants to the Air)

5.1.2 Emission Summary and Dispersion Modelling (ESDM) Report

Is the review of an existing, approved ESDM required as part of this proposed application?

☐ Yes ☐ No

If yes, identify the number of emission sources described in the existing ESDM Report that emit contaminants in common with the sources forming the subject of the application (if none, enter zero).

Have all of these emission sources been described in an ESDM Report that was previously reviewed as part of an application for an existing Environmental Compliance Approval?

☐ Yes ☐ No

✓ Completion Status (5.1.2 ESDM Report)

5.1.3 O. Reg. 419/05 Requirements

Which of the following sections of O. Reg. 419/05 applies to the facility?

☐ s.19 (Schedule 2)

☐ s. 20 (Schedule 3)

☐ Does not apply. Please indicate reason _____

Has an instrument under O. Reg. 419/05 been issued?

☐ Yes ☐ No

If yes, what type(s) of instruments (including any notices, orders or approvals) has (have) been issued? (select all that apply)

☐ ss. 4(2) Adjacent Properties

☐ ss. 7(1) Specified Dispersion Models

☐ ss. 8(2) Negligible Sources

☐ ss. 10(2) Operating Conditions

☐ ss. 11(2) Refined Emission Rates

☐ ss. 13.1 Value of Dispersion Modeling Parameters

☐ ss. 13(1) Meteorological Data

☐ ss. 14(6) Area of Modelling Coverage

☐ ss. 20(4) Speed-up Request

☐ ss. 20(5) Speed-up Order

☐ s. 35 Site-specific Standard

☐ ss. 35(14) Site-specific Standard Order

☐ ss. 39(3) Technical Standard Registration (Industry Standard)

☐ ss. 39(4) Technical Standard Registration (Equipment Standard)

☐ Other (list all that have been issued) _____

Is an instrument under O. Reg. 419/05 being requested as part of this application?

☐ Yes ☐ No

If yes, what type(s) of notice, order or approval is (are) being requested?

☐ ss. 7(1) Specified Dispersion Models

☐ ss. 8(2) Negligible Sources

☐ ss. 10(2) Operating Conditions

☐ ss. 11(2) Refined Emission Rates

☐ ss. 13(1) Meteorological Data

☐ ss. 14(6) Area of Modelling Coverage

☐ ss. 20(4) Speed-up Request

☐ s. 32 Request for a Site-specific Standard Order

☐ ss. 39(1)(a) Application for Technical Standard Registration (Industry Standard)

☐ ss. 39(1)(b) Application for Technical Standard Registration (Equipment Standard)

☐ Other (list all that have been issued) _____

Please attach the form(s) requesting the notice(s) and/or order(s) and any additional supporting information.

Has an s. 30 Upper Risk Threshold (Schedule 6) been exceeded?

☐ Yes ☐ No

If yes, please include additional supporting information.

Is the facility located in a multi-tenant building?

☐ Yes ☐ No

If yes, additional information may be requested.

Are all of the contaminants to which the application relates represented in the Ministry of the Environment and Climate Change publication titled "Summary of Standards and Guidelines to support Ontario Regulation 419: Air Pollution- Local Air Quality' or have they been screened out based on the publication titled " Jurisdictional Screening Level (JSL) List, A Screening Tool for Ontario Regulation 419: Air Pollution - Local Air Quality"?

☐ Yes ☐ No

(If no, please attach Supporting Information for a Maximum Ground Level Concentration Acceptability Request for Compounds with no Ministry POI Limit - Supplement to Application for Approval, EPA S. 9).

✓ Completion Status (5.1.3 O. Reg. 419/05 Requirements)

✓ Completion Status (5.1 Air)

5.2 Noise Note** - If the application does not have noise emissions please proceed to Section 5.3

5.2.1 Noise Assessment Information

Has an Acoustic Assessment Report (AAR) been completed in relation to the proposed project/activity?

☐ Yes ☐ No

If yes, please attach the Acoustic Assessment Report

Does the AAR show that applicable limits are met?

☐ Yes ☐ No

If no, please attach the Acoustic Assessment Report including the Noise Abatement Action Plan

If no, is the application eligible for Primary or Secondary Noise Screening?

☐ Yes ☐ No

Note that if the proposed activity is not eligible for either of the screenings, an AAR must be submitted.

If yes, is the proposed activity eligible for the Primary Noise Screening?

☐ Yes ☐ No

If yes, is the actual separation distance between the facility and the nearest noise sensitive point of reception (POR) greater than the minimum required separation distance calculated from the Primary Noise Screening?

☐ Yes ☐ No

If yes, please attach the Primary Noise Screening form and supporting documentation.
Note that if the Primary Noise Screening is not successful then the applicant may attempt to proceed with the Secondary Noise Screening.

If no, does the Secondary Noise Screening Form show that the applicable sound level limits are met?

☐ Yes ☐ No

If yes, please attach the Secondary Noise Screening Form and supporting documentation.
Note that if meeting the applicable sound level limits cannot be demonstrated, then an AAR must be submitted.

✓ Completion Status (5.2.1 Noise Assessment)

5.2.2 Equipment Subject to Noise Review

Description	Number of Pieces of Equipment
☐ Arc Furnaces	
☐ Asphalt Plants	
☐ Blow-down Devices	
☐ Co-Generation Facilities	
☐ Crushing Operations	
☐ Flares	
☐ Gas Turbines	
☐ Pressure Blowers or Large Induced Draft Fans (flow rate > 47 m^3/second or static pressure > 1.25 kilopascals)	
☐ Any other equipment not listed above that has not previously been reviewed by the Director in connection with an application for an Environmental Compliance Approval with respect to the facility	
☐ Any other equipment not listed above that is identical to equipment for which a noise assessment was previously reviewed by the Director in connection with an application for an Environmental Compliance Approval with respect to the facility	

✓ Completion Status (5.2.2 Equipment Subject to Noise Review)

✓ Completion Status (5.2 Noise)

5.3 Sewage Works Information

Note** - If the application does not contain Sewage Works please proceed to Section 5.4

5.3.1 Facility Type - Sewage Works

Select the type of facility that is the subject of the application (select all that apply). *

☐ Sewage Treatment Plant (STP) ☐ Stormwater Management Facility

For the following, the applicant must complete and attach the relevant sections of the pipe data form:

☑ Storm Sewers ☐ Ditches ☐ Combined Sewers

☐ Force mains ☑ Sanitary Sewers ☐ Pumping Station

Sewage Treatment Plant Details

☐ Primary ☐ Secondary ☐ Tertiary

☐ Receives septage ☐ Constructed/Engineered Wetlands ☐ On-site system

☐ Lagoons (check all that apply below)

☐ Septage ☐ Municipal ☐ Other (specify) _____

Facility Type

☐ Municipal or private facility

Category: ☐ New ☐ 1 ☐ 2 ☐ 3 ☐ 4

Please indicate the maximum design capacity of the municipal or private sewage treatment plant:

☐ ≤ 4,500 m^3/day ☐ > 4,500 m^3/day

☐ Facility for the treatment of leachate

Category: ☐ New ☐ 1 ☐ 2 ☐ 3 ☐ 4

☐ Facility for the treatment of industrial process wastewater

Category: ☐ New ☐ 1 ☐ 2 ☐ 3 ☐ 4

☐ Facility for the disposal of non-contact cooling water

☐ Subsurface disposal

Please indicate the design capacity of the subsurface disposal:

☐ ≤ 15m^3/day ☐ > 15 m^3/day and < 50 m^3/day ☐ > 50 m^3/day

Stormwater Management Facility Details

Category: ☐ New ☐ 1 ☐ 2 ☐ 3 ☐ 4

Pond Type

☐ Wet Pond ☐ Dry Pond ☐ Other (specify) _____

What is the drainage area (in hectares) associated with the proposed activity? _____

Does the applicant own all, or part of the drainage area?

☐ Applicant owns all of the drainage area

☐ Applicant owns part of the drainage area

☐ Applicant does not own the drainage area

For the drainage area land that the applicant does not own, does the applicant have an agreement with the owner(s) of the drainage area?

☐ Yes ☐ No

What is the predominant type of land use in the drainage area?

☐ Rural or Agricultural ☐ Commercial or Industrial ☐ Residential

Is a Hydrogeological Assessment required? *

☐ Yes ☑ No

(If yes, please attach the hydrogeological assessment.)

Is a review of effluent criteria assessment for stormwater management, cooling water or soil remediation facilities required? *

☐ Yes ☑ No

(If yes, please attach the final effluent criteria accepted by the Regional Office of the Ministry.)

Is a review of effluent criteria assessment for municipal or private sewage, industrial process wastewater or leachate treatment plant required? *

☐ Yes ☑ No

(If yes, please attach the final effluent criteria accepted by the Regional Office of the Ministry.)

Note: The Hydrogeological Assessment, effluent criteria, and surface water assessment must be discussed and prepared with the Ministry's regional technical support section during a pre-application meeting(s) and consultation(s) with the Ministry. A proof of concurrence from technical support must be included as part of the ECA application package.

✓ Completion Status (5.3.1 Facility Type - Sewage Works)

5.3.2 Servicing

The works will provide sewage servicing for (select all that apply): *

☑ Residential

Residential Type *

☑ Subdivision ☐ Condominium ☐ Institutional

☐ Other (specify) _____

Is there a Municipal Responsibility Agreement in place? *

☐ Yes ☐ No ☑ N/A

(If yes, please attach a copy of the Municipal Responsibility Agreement.)

☐ Commercial

Commercial Type

☐ Hotel, Motel, Inn ☐ Campground, Park ☐ Rental Cabins

☐ Resort ☐ Shopping Malls ☐ Restaurant

☐ Highway Service Station/Gas Bars ☐ Other (specify) _____

☐ Industrial

Describe _____

✓ Completion Status (5.3.2 Servicing)

5.3.3 Sewage Servicing for Waste Disposal/Landfill Sites

Does/Will the sewage treatment facility receive waste disposal/landfill site leachate? *

☐ Yes ☑ No

If yes, please identify the site(s) below.

Name of Site Contributing Leachate	Environmental Compliance Approval Number	Volume of Leachate (m^3)
1.		

✓ Completion Status (5.3.3 Sewage Servicing for Waste Disposal/Landfill Sites)

✓ Completion Status (5.3 Sewage Works)

5.4 Waste Disposal Site

Note** - If the application is not for a waste disposal or processing site please proceed to Section 5.5

5.4.1 Facility Description - Waste Disposal Site (information on the nature of the proposed business or activity at this site)

Service Area	Total Area of Site (hectares)

Monitoring (select all that apply)

☐ Groundwater ☐ Surface Water ☐ Landfill Gas

☐ Leachate ☐ None

☐ Other (specify) _____

Type(s) of waste to be accepted at this site (select all that apply)

Subject:

☐ Hazardous Waste

☐ Liquid Industrial Waste

Non-subject:

☐ Municipal (non-hazardous)

☐ Other Liquid Waste

Municipal waste categories to be accepted at this site (select all that apply)

☐ All Categories ☐ Contaminated Soil ☐ Domestic Sources

☐ IC & I Sources ☐ Source Separated Organics ☐ Tires

☐ Leaf and Yard Waste ☐ Wood Waste ☐ Blue Box Materials

☐ Other (specify) _____

Other liquid waste categories to be accepted at this site (select all that apply)

☐ Processed Organics ☐ Hauled Sewage

☐ Waste from Food Processing/Preparation Operations ☐ Other (specify) _____

Hazardous Waste / Liquid Industrial Waste

Class Code	Class Code	Class Code	Class Code	Class Code

✓ Completion Status (5.4.1 Facility Description - Waste Disposal Site)

5.4.2 Waste Transfer/Processing/Composting - Complete this information if waste transfer and/or processing and/or composting take(s) place at this facility

Waste Type to be Transferred or Processed

☐ Hazardous waste or liquid industrial waste

Design Capacity

☐ ≤ 100 tonnes per day ☐ > 100 tonnes per day

☐ Waste other than hazardous waste and liquid industrial waste

Design Capacity

☐ ≤ 100 tonnes per day ☐ > 100 tonnes per day

Change to Operations

☐ No Change Proposed

☐ Change does not require fundamental design review

☐ Change requires fundamental design review

Liquid Waste

Maximum Storage Capacity (m^3)

Hazardous	Liquid Industrial	Other Liquid Waste

Maximum Residual for Final Disposal (m^3)

Hazardous		Liquid Industrial Waste		Other Liquid Waste	
Daily	Annually	Daily	Annually	Daily	Annually

Solid Waste

Maximum Storage Capacity (tonnes)

Hazardous	Non-Hazardous

Maximum Residual for Final Disposal (tonnes)

Hazardous		Non-hazardous	
Daily	Annually	Daily	Annually

Maximum Amount of Waste to be Received Daily

Liquid (m^3)			Solid (tonnes)	
Hazardous	Liquid Industrial	Other Liquid Waste	Hazardous	Non-hazardous

✓ Completion Status (5.4.2 Waste Transfer/Processing/Composting)

5.4.3 Thermal Treatment Facility - Complete this information if thermal treatment takes place at this facility

Waste Type for Thermal Treatment

☐ Hazardous waste or liquid industrial waste

Design Capacity

☐ ≤ 100 tonnes per day ☐ > 100 tonnes per day

☐ Waste other than hazardous waste and liquid industrial waste

Design Capacity

☐ ≤ 100 tonnes per day ☐ > 100 tonnes per day

Change to Operations

☐ No Change Proposed

☐ Change does not require fundamental design review

☐ Change requires fundamental design review

Liquid Waste

Maximum Storage Capacity (m^3)

Hazardous	Liquid Industrial	Other Liquid Waste

Maximum Residual for Final Disposal (m^3)

Hazardous		Liquid Industrial Waste		Other Liquid Waste	
Daily	Annually	Daily	Annually	Daily	Annually

Solid Waste

Maximum Storage Capacity (tonnes)

Hazardous	Non-Hazardous

Maximum Residual for Final Disposal (tonnes)

Hazardous		Non-hazardous	
Daily	Annually	Daily	Annually

Maximum Amount of Waste to be Received Daily

Liquid (m^3)			Solid (tonnes)	
Hazardous	Liquid Industrial	Other Liquid Waste	Hazardous	Non-hazardous

Maximum Daily Feed Rate (tonnes/m^3)

Hazardous Waste (tonnes)	Non-hazardous Waste (tonnes)	Liquid Industrial Waste (m^3)	Other Liquid Waste (m^3)

✓ Completion Status (5.4.3 Thermal Treatment Facility)

5.4.4 Landfill Site - Complete this information if this facility operates as a landfill site

Waste Types to be accepted at the Landfill

☐ Hazardous waste or liquid industrial waste

Design Capacity

☐ ≤ 40,000 m^3 ☐ > 40,000 m^3 ≤ 3 million m^3 ☐ > 3 million m^3

☐ Waste is only uncontaminated tree stumps, leaves, branches, concrete and rocks

Design Capacity

☐ ≤ 40,000 m^3 ☐ > 40,000 m^3 ≤ 3 million m^3 ☐ > 3 million m^3

☐ Waste other than hazardous waste and liquid industrial waste, other than uncontaminated tree stumps, leaves, branches, concrete and rocks.

Design Capacity

☐ ≤ 40,000 m^3 ☐ > 40,000 m^3 ≤ 3 million m^3 ☐ > 3 million m^3

Change to Operations

☐ No Change Proposed

☐ Change does not require fundamental design review or hydrogeological assessment

☐ Change requires fundamental design review or hydrogeological assessment

Note: The Hydrogeological Assessment, effluent criteria, and surface water assessment must be discussed and prepared with the Ministry's regional technical support section during a pre-application meeting(s) and consultation(s) with the Ministry. A proof of concurrence from technical support must be included as part of the ECA application package.

Maximum Landfilling Capacity (m^3)

Hazardous Waste	Non-hazardous Waste	Liquid Industrial Waste	Other Liquid Waste

Maximum Amount of Waste to be Received

Hazardous Waste (tonnes)		Non-hazardous Waste (tonnes)		Liquid Industrial Waste (m^3)		Other Liquid Waste (m^3)	
Daily	Annually	Daily	Annually	Daily	Annually	Daily	Annually

Landfill Information

Area to be Landfilled (hectares)	Total Site Area including Buffer Area (hectares)
Estimated Date of Closure (yyyy/mm/dd)	Population Served

Control Types (select all that apply)

☐ Leachate Collected and Treated Off-site ☐ Leachate Collected and Treated On-site

☐ Landfill Gas Collected and Flared ☐ Landfill Gas Collected for Energy Generation

☐ Other (specify) _____

✓ Completion Status (5.4.4 Landfill Site)

✓ Completion Status (5.4 Waste Disposal Site)

5.5 Waste Management Systems (Except Mobile Waste Processing)

Note**- If the application is not for a waste management system please proceed to Section 5.7.

5.5.1 Fleet List (all vehicles and equipment to be used in the operation of the Waste Management System)

Year	Make	Model	Vehicle Identification Number (VIN)	License Plate Number	Province/State

Separate list attached?

☐ Yes ☐ No

✓ Completion Status (5.5.1 Fleet List)

5.5.2 Vehicle Information

Are all the vehicles to be used owned by the applicant?

☐ Yes ☐ No

If no, please include additional information about ownership arrangements for each vehicle not owned by the applicant.

Has a minimum of $1,000,000.00 liability insurance been obtained for all vehicles for which it is required?

☐ Yes ☐ No

Describe any additional insurances that are held (for example, environmental impairment liability insurance).

✓ Completion Status (5.5.2 Vehicle Information)

5.5.3 General Waste Management System

Type(s) of Waste to be Transported by the General Waste Management System (select all that apply)

Subject:

☐ Hazardous Waste

☐ Liquid Industrial Waste

Non-subject:

☐ Municipal (non-hazardous)

☐ Other Liquid Waste

Non-subject Categories to be Transported by the General Waste Management System (select all that apply)

☐ Blue Box Materials

☐ Commercial

☐ Leaf/Yard Waste

☐ Spill Cleanup Material

☐ Tires

☐ Waste Wash Water

☐ Waste from Food Processing/ Preparation Operations

☐ Processed Organics (not for land application)

☐ Domestic Sources

☐ Non-Hazardous Solid Industrial

☐ Wood Waste

☐ Contaminated Soil

☐ Asbestos Waste in Bulk

☐ Grease Trap Waste

☐ Dewatered Catch Basin Clean-out Material

☐ Other (specify) _____

Subject Waste Categories to be Transported by the General Waste Management System

Hazardous Waste / Liquid Industrial Waste

Class Code	Class Code	Class Code	Class Code	Class Code

Separate list attached?

☐ Yes ☐ No

☐ All drivers are/will be trained in accordance with O. Reg. 347 and all pertinent environmental legislation.

☐ Each vehicle used to transport a specific subject waste class is suitable for that waste transportation in order to protect the health and safety of the public and the natural environment.

Note: For transporters of pathological waste and PCBs (waste classes 243 and 312) Operations Manual and Driver Training Manual must also be attached and Financial Assurance must be provided.

General Waste Management System - Disposal Site Information

What is the Final Destination of Waste to be Transported by the General Waste Management System? (select all that apply)

☐ A disposal site in Ontario approved by the Ministry of the Environment and Climate Change

☐ Disposal sites outside of Ontario approved by another regulatory agency

List the destination province(s)/state(s)

Province/State	Province/State	Province/State	Province/State

✓ Completion Status (5.5.3 General Waste Management System)

5.5.4 Soil Conditioner Waste Management System (includes non-agricultural source material (NASM) that is waste and processed organic waste (biosolids) destined for land application only)

Has the applicant received recommendation from Biosolids Utilization Committee (BUC) for land application of processed organic waste (biosolids) or NASM?

☐ Yes If yes, please provide a copy of the BUC recommendation.

☐ No If no, please clarify _____

Spreading equipment (land application only)

Equipment Type	Make and Model	Description

Separate list attached?

☐ Yes ☐ No

Method of system operation (land application only)

Estimated quantity to be handled on an annual basis (cubic metres/litres/tonnes)

Please describe the loading procedures:

Please describe the spreading methods:

Please describe the storage facilities (tanks, lagoons, etc.):

Soil Conditioner Waste Management System - Land Application Sites

What is the final destination of waste to be transported by the soil conditioner waste management system? (must include for land application only)

☐ Non-agricultural land ☐ Agricultural land ☐ Both agricultural and non-agricultural land

✓ Completion Status (5.5.4 Soil Conditioner Waste Management System)

5.5.5 Hauled Sewage (Septage) Waste Management System

Type(s) of hauled sewage (septage) to be transported

☐ Portable toilet waste ☐ Septic tank waste ☐ Holding tank waste

☐ Other (specify) _____

Spreading equipment (land application only)

Equipment Type	Make and Model	Description

Separate list attached?

☐ Yes ☐ No

Does this system include in-transit storage?

☐ Yes ☐ No

If yes:

a) What is the duration of storage? Please specify (Maximum period of in-transit storage should not exceed more than two weeks):

b) Is the storage tank a prefabricated tank with the capacity < 100,000 L, designed and constructed in accordance with a Class 5 Sewage System under the Ontario Building Code or CAN/CSA B66-05?

☐ Yes ☐ No If no, please provide a copy of the design of the storage tank signed and dated by a professional engineer.

Does this system include in-transit processing?

☐ Yes ☐ No

If yes:

a) Location of in-transit processing:

☐ In Vehicle ☐ In-storage Tank

b) Describe the method of in-transit processing:

Does this system use barge/boat to transport hauled sewage (septage)?

☐ Yes ☐ No

If yes:

a) Has a minimum of $1,000,000.00 liability insurance been obtained for the barge/boat for which it is required?

☐ Yes ☐ No

b) Does the barge/boat have an engine of 10 horsepower (hp) or more, for which a commercial vessel license is required from Transport Canada?

☐ Yes ☐ No If yes, please include a copy of the commercial vessel license.

Note: For in-transit storage or processing the applicant must include with the application the consent of the landowner, if the landowner is different than the applicant. A financial assurance estimate must be provided by applicants using in-transit storage or using in-transit processing where processing is conducted in the in-transit storage tanks.

Hauled Sewage (Septage) Waste Management System - Land Application Sites ☐ N/A

List the Environmental Compliance Approval Number(s) of all disposal site(s) approved by the Ministry of the Environment and Climate Change for land application of hauled sewage in association with this waste management system.

Instrument Type	Instrument Number	Approval or Application Date (yyyy/mm/dd)

✓ Completion Status (5.5.5 Hauled Sewage (Septage) Waste Management System)

✓ Completion Status (5.5 Waste Management Systems (Except Mobile Waste Processing))

5.6 Waste Management System - Mobile Waste Processing

Note**: If the application is not for the use and operation of mobile waste processing equipment, proceed to Section 5.7

5.6.1 Mobile Waste Management System Process and Equipment Description

Type(s) of Waste to be Processed (select all that apply)

Subject:

☐ Hazardous Waste

☐ Liquid Industrial Waste

Non-subject:

☐ Municipal (non-hazardous)

☐ Other Liquid Waste

Type of Waste to be Processed by the Unit(s)	Number of Units	Financial Assurance (per unit)	Financial Assurance Required
Non-hazardous Solid Waste		$5,000	
Hazardous Waste		$20,000	
Liquid Industrial Waste		$20,000	
Other Liquid Waste		$20,000	
Multiple Types of Waste from the Categories Above		$20,000	
	Total Financial Assurance		

Municipal (non-hazardous) Waste Categories to be Processed (select all that apply)

☐ Contaminated Soil at Cleanup Site ☐ Wood Waste ☐ Construction and Demolition Waste

☐ Asbestos Waste ☐ Tires ☐ Domestic Waste

☐ Other (specify) _____

Other Liquid Waste Categories to be Processed (select all that apply)

☐ Hauled Sewage ☐ Waste from Food Processing/Preparation Operations ☐ Processed Organic

☐ Other (specify) _____

Hazardous / Liquid Industrial Waste Types to be Processed

Class Code	Class Code	Class Code	Class Code	Class Code

✓ Completion Status (5.6.1 Mobile Waste Management System Process and Equipment Description)

5.6.2 Equipment Information - Please attach a separate list if more space is required.

Equipment List

Unit No.	Unit Type	Process Description	Equipment Type	Make	Model	Serial Number	Equipment Capacity (including unit of measurement)

Separate list attached?

☐ Yes ☐ No

✓ Completion Status (5.6.2 Equipment Information)

✓ Completion Status (5.6 Waste Management System - Mobile Waste Processing)

5.7 Cleanup of Contaminated Sites

Note** - If the application is not for a cleanup of a contaminated site please proceed to Section 6.

Type of Cleanup

☐ In-situ ☐ Ex-situ ☐ Both

Contaminated media to be treated:

☐ Groundwater ☐ Surface water ☐ Sediment ☐ Soil

Waste Type

Subject:

☐ Hazardous Waste

☐ Liquid Industrial Waste

Non-subject:

☐ Municipal (non-hazardous)

☐ Other Liquid Waste

Type of discharge

☐ Air ☐ Groundwater ☐ Storm or sanitary ☐ Surface water

☐ Noise

✓ Completion Status (5.7 Cleanup of Contaminated Sites)

6. Supporting Documentation and Technical Requirements

6.1 General

This is a list of supporting information to this application and is subject to the FIPPA and EBR.

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Proof of legal name	Required	☑ Yes ☐ No		☐
Enhanced EBR description	N/A	☐ Yes ☐ No		☐
Provincial Officer Notice	N/A	☐ Yes ☐ No		☐
Inspection Report	N/A	☐ Yes ☐ No		☐
Detailed project and process description	Required	☑ Yes ☐ No		☐
Pre-application Consultation Record	N/A	☐ Yes ☐ No		☐
Legal Survey(s)	N/A	☐ Yes ☐ No		☐
Site Plan(s)	Required	☑ Yes ☐ No		☐
Scaled area location plan(s) with geo-referencing points identified	Required	☑ Yes ☐ No		☐
Documentation in support of EBR Exception	Required	☑ Yes ☐ No		☐
Proof of Compliance with EAA Requirements	Required	☑ Yes ☐ No		☐
Proof of Consultation/Notification	Required	☑ Yes ☐ No		☐
Financial Assurance Estimate	Optional	☐ Yes ☑ No	N/A	☐
Name, address and consent of land/ site owner for the installation and operation of the proposed activity or storage location of equipment or vehicle	N/A	☐ Yes ☐ No		☐
Name, address and phone number of the Operating Authority	Required	☑ Yes ☐ No		☐
Copy of NEPDA Permit	N/A	☐ Yes ☐ No		☐
Copy/Proof of Municipal Planning Approval (ORMCA, general)	N/A	☐ Yes ☐ No		☐
Municipal Zoning Confirmation Letter	N/A	☐ Yes ☐ No		☐
Zoning map	Required	☑ Yes ☐ No		☐
Conservation Authority Clearance	Required	☑ Yes ☐ No		☐
Director's approval for Policy 2 Deviation	N/A	☐ Yes ☐ No		☐
Application Fee	Required	☑ Yes ☐ No		☐
A copy of this application has been sent to the Ministry Local District Office	Required	☑ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.1 General)

6.2 Air

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Emission Summary and Dispersion Modelling (ESDM) Report prepared in accordance with s. 22 and of O. Reg. 419/05 (including signed checklist)	N/A	☐ Yes ☐ No		☐
Electronic copy of the Dispersion Modelling input and output files prepared in accordance with s. 26 of O. Reg. 419/05	N/A	☐ Yes ☐ No		☐
Supporting Information for a Maximum Ground Level Concentration Acceptability Request for Compounds with no Ministry POI Limit - Supplement to Application for Approval, EPA S. 9	N/A	☐ Yes ☐ No		☐
Copies of forms requesting O. Reg. 419/05 instruments and supporting documentation	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.2 Air)

6.3 Noise and Vibration

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Primary Noise Screening	N/A	☐ Yes ☐ No		☐
Secondary Noise Screening	N/A	☐ Yes ☐ No		☐
Acoustic Assessment Report including signed checklist (AAR)	N/A	☐ Yes ☐ No		☐
Vibration Assessment Report	N/A	☐ Yes ☐ No		☐
Noise Abatement Action Plan	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.3 Noise and Vibration)

6.4 Sewage Works

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Signed Municipal Responsibility Agreement	N/A	☐ Yes ☐ No		☐
Detailed description of the proposed activities/works	Required	☑ Yes ☐ No		☐
Notice of Completion for the Environmental Study Report (ESR)	Optional	☐ Yes ☑ No	N/A	☐

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Design Brief	Required	☑ Yes ☐ No		☐
Preliminary Engineering Report	Optional	☐ Yes ☑ No	N/A	☐
Final Plans	Required	☑ Yes ☐ No		☐
Engineering Drawings and Specifications	Required	☑ Yes ☐ No		☐
Sewage quantity and quality characteristics	Required	☑ Yes ☐ No		☐
Stormwater Management Report	Required	☑ Yes ☐ No		☐
Stormwater Management Plan	Required	☑ Yes ☐ No		☐
Hydrogeological Assessment with proof of concurrence from the Ministry's Regional technical support section	N/A	☐ Yes ☐ No		☐
Environmental Impact Analysis	Optional	☐ Yes ☑ No	N/A	☐
Final effluent criteria accepted with proof of concurrence from the Ministry's Regional Technical Support Section	N/A	☐ Yes ☐ No		☐
Sewage Works Limited Operational Flexibility Requirements - Engineer's Report	N/A	☐ Yes ☐ No		☐
Sewage Works Limited Operational Flexibility Requirements - Declarations	N/A	☐ Yes ☐ No		☐
Pipe Design Data Form	Required	☑ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.4 Sewage)

6.5 Waste Disposal Sites

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Design and Operations Report	N/A	☐ Yes ☐ No		☐
Stormwater Management Report	Optional	☐ Yes ☐ No		☐
Hydrogeological Assessment with proof of concurrence from the Ministry's Regional technical support section	N/A	☐ Yes ☐ No		☐
Assessment of Physical and Water Use Conditions	Optional	☐ Yes ☐ No		☐
Waste Limited Operational Flexibility Requirements - Engineer's Report	N/A	☐ Yes ☐ No		☐
Waste Limited Operational Flexibility Requirements - Declarations	N/A	☐ Yes ☐ No		☐
Copy of notification to adjacent landowners	N/A	☐ Yes ☐ No		☐

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.5 Waste Disposal Sites)

6.6 Waste Management Systems

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Proof of vehicle and/or equipment ownerships	N/A	☐ Yes ☐ No		☐
Complete Fleet List (list of all vehicles, trailers and equipment used)	N/A	☐ Yes ☐ No		☐
Copy of the Liability Insurance for all vehicles for which insurance is required	N/A	☐ Yes ☐ No		☐
Copy of BUC recommendation	N/A	☐ Yes ☐ No		☐
Copy of the storage tank design	N/A	☐ Yes ☐ No		☐
Copy of commercial vehicle licence	N/A	☐ Yes ☐ No		☐
Description of the physical location where the vehicles transporting biomedical waste are being disinfected	Optional	☐ Yes ☐ No		☐
Drivers Training Manual (for PCB/ Biomedical Waste)	Optional	☐ Yes ☐ No		☐
A copy of the applicant's Operation Plan including detailed packaging and biomedical waste handling methods	Optional	☐ Yes ☐ No		☐
Contingency and Emergency Procedures Plan (for PCB/ Biomedical Waste/Hauled Sewage (Septage))	Optional	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.6 Waste Management Systems)

6.7 Mobile Waste Processing ☐ N/A

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Design and Operations Report - Mobile Waste Processing of General Waste	N/A	☐ Yes ☐ No		☐
Design and Operations Report - Mobile Waste Processing of Liquid Waste	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.7 Mobile Waste Processing)

6.8 Cleanup of Contaminated Sites ☐ N/A

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Design Report for Cleanup of Contaminated Sites	N/A	☐ Yes ☐ No		☐
Other (please describe)	Optional	☐ Yes ☐ No		☐

✓ Completion Status (6.8 Cleanup of Contaminated Sites)

6.9 Other Attachments ☐ N/A

Title	Reference	Confidential
		☐

Is there an attachment of an additional list of attachments?

☐ Yes ☐ No

If there is not enough space to list all of the attachments included in this application package, please include an additional listing of these attachments.

✓ Completion Status (6.9 Other Attachments)

6.10 Confidentiality

Attachment	Required, Optional or N/A	Attached?	If no, provide explanation, (include referenced attachment if more space is required for rationale)	Confidential
Explanation for confidentiality	N/A	☐ Yes ☐ No		☐

✓ Completion Status (6.10 Confidentiality)

Please note: The collection of personal information in this application is necessary to administer the Ministry's approvals program, which is authorized pursuant to the *Environmental Protection Act* and the *Ontario Water Resources Act*. The personal information collected in this application will be used to administer the program, including for the purposes of the Ministry's compliance and enforcement activities under the aforementioned acts, and for the purposes of making information in respect of Environmental Compliance Approvals available to the public with the exception of payment information. Questions about the collection of the information can be directed to a Client Service Representative, Client Services and Permissions Branch, 135 St. Clair Avenue West, 1st Floor, Toronto ON M4V 1P5; Telephone outside Toronto 1-800-461-6290 or in Toronto 416-314-8001 or Fax 416-314-8452.

7. Authorization

7.1 Statement of the Applicant

I am authorized to prepare and submit this application and to make this certification. I have reviewed the complete application and I have made all inquiries that are necessary to declare to the best of my knowledge, information and belief:

- The information contained in this application is complete and accurate.
- The Technical Contact(s) identified in this application has/have been authorized to prepare certain technical material, and act on behalf of the applicant to discuss this application with the Ministry of the Environment and Climate Change and to provide additional information about this application to the Ministry on request.
- The information provided to the Technical Contact(s) in relation to this application is complete and accurate.

Name of Signing Authority (Please print) *			
Hugo Lalonde			
Title *			
Director, Land Development			
Telephone Number	ext.	Mobile Number	Fax Number
613-295-5082			
Email Address			
hugo.lalonde@caivan.com			
Signature			Date (yyyy/mm/dd)

✓ Completion Status (7.1 Statement of the Applicant)

7.2 Statement of the Municipality ☐ N/A

I, the undersigned hereby declare on behalf of the Municipality, that the Municipality has no objection to the construction of the works in the Municipality.

Name (Please print) *	
Natasha Baird	
Title *	Name of Municipality *
Senior Engineer - Development Review	Ottawa
Signature	Date (yyyy/mm/dd)

✓ Completion Status (7.2 Statement of the Municipality)

7.3 Statement of Technical Contacts

Technical Contact 1

I have been authorized by the applicant to prepare the technical materials for the area(s) of responsibility identified in section 2.6 that are included in the application. I have reviewed those technical materials and I have made all inquiries that are necessary to declare to the best of my knowledge, information and belief:

- The technical materials contained in this application in respect of the area(s) of responsibility identified in section 2.6 are complete and accurate.
- I have the relevant education and experience necessary to provide this certification.

Name of Technical Contact (Please print) *	
Kevin L. Murphy	
Signature	Date (yyyy/mm/dd)

✓ Completion Status (7.3 Statement of Technical Contacts)

8. Payment Information - Application for an Environmental Compliance Approval

Please Note:

1. If this form has been completed by hand, the fee calculations must be completed and attached separately. The supplemental fee calculations do not need to be included if this form has been completed electronically.

2. If this form has been completed electronically, the fees for this application have been calculated based on the information provided. The Ministry may require additional information during the review of the application that could impact the total fee required.

3. All fees should be paid in Canadian funds, payable to the *Minister of Finance*, except fees for *Transfer of Review*, which are payable to the local municipality.

4. Credit card payments are accepted for payments under $10,000 only. **Never email credit card information.**

5. If payment is being made by certified cheque or money order, please staple the payment to this page.

6. The information collected in this section of the form is considered confidential and will only be used to process the application fee.

7. To protect credit card information, do not submit this page containing payment information via e-mail or any other electronic means if it includes credit card information. Credit card information should be submitted only by mail, facsimile, or hand-delivery. Applications containing payment information that are submitted via e-mail or any other electronic means will not be processed and will be destroyed.

Do not include this page in the copies of the application that are being provided to the Local Ministry District Office.

Amount Enclosed	Method of Payment *
1,100	☑ Certified Cheque ☐ Money Order ☐ VISA ☐ MasterCard

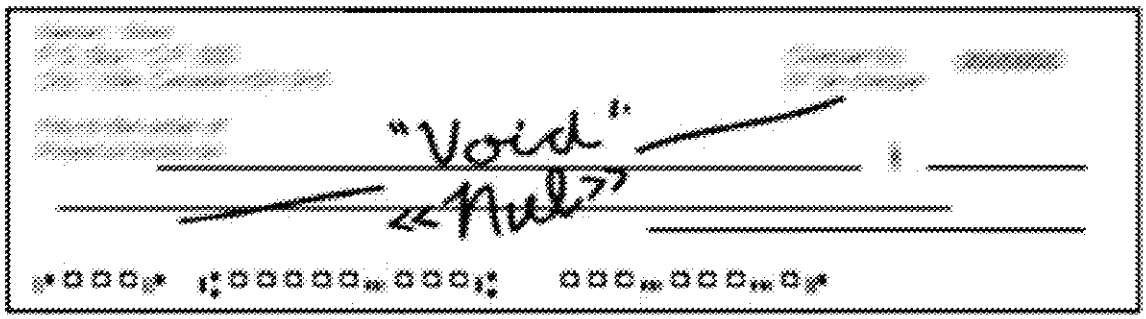
Credit Card Information (if paying by VISA or MasterCard)

Name of Cardholder (Please print)

Card Number	Expiry Date (mm/yy)
Card Holder's Signature	Date (yyyy/mm/dd)

✓ Completion Status (8 Payment Information)

If paying by certified cheque or money order, please attach it here.



Application Summary

For Office Use Only			
Reference Number	Payment Received ($)	Date (yyyy/mm/dd)	Initials

Applicant Name
Caivan (Mer Bleu) Inc.

Project Name
Cassette Subdivision - 2275 Mer-Bleue Road

Project Description Executive Summary
Installation of new sanitary and storm sewers, including erosion control measures, and all related appurtenances to service the proposed Cassette Subdivision located at 2275 Mer-Bleue Road in the Cumberland Ward. Proposed sanitary sewers will connect to existing 200 mm diameter sanitary sewer stubs from Sculpin Street and Aquarium Drive that are within the existing Minto Avalon Development and ultimately conveyed to the Tenth Line Road Pump Station (ECA #7375-A8QGEU, April 12, 2016). Proposed storm sewers collect flows from the subdivision and discharge to the existing Minto Avalon Development infrastructure (975mm diameter sewer stubs from Sculpin Street and Aquarium Drive) which are tributary to the Avalon West (Neighborhood 5) Stormwater Management Pond Expansion (ECA #6142-BEJHCE, dated August 1, 2019). The related ECA's for Stage 5 and Stage 6 of the Minto Avalon Development are ECA #0606-AHXJCH (dated February 2, 2017) and ECA #8605-AYUHJG (dated May 30, 2018), respectively. Enhanced Level Quality Control (80% total suspended solids removal) will be achieved in the Avalon West (N5) SWM Facility.

Supplemental Application Information
Construction is anticipated to begin in August/September 2022.

Application Status

Section	Completed?
1. Application Information	☑ Yes ☐ No
2. Project Information	☑ Yes ☐ No
3. Regulatory Requirements	☑ Yes ☐ No
4. Site Information	☑ Yes ☐ No
5. Facility Information	☑ Yes ☐ No
6. Supporting Documentation	☑ Yes ☐ No
7. Payment Information	☑ Yes ☐ No
8. Authorization	☑ Yes ☐ No

Fee Summary

Activity	Amount ($)
Administrative Processing	$200.00
Review of EPA s. 9 activities	$0.00
Review of EPA s. 27 activities	$0.00
Review of OWRA s. 53 activities	$900.00
Total Fee	$1,100.00

The Ministry may request additional fees upon review of this application.
If this form is submitted in print version only and the smart calculation feature is not used, please attach the fee calculation separately.

Ontario

Ministry of the Environment, Conservation and Parks

Pipe Data Form - Watermain, Storm Sewer, Sanitary Sewer, and Forcemain Design Supplement to Application for Approval for Water and Sewage Works

General

Information requested in this form is collected under the authority of the *Ontario Water Resources Act*, R.S.O. 1990 (OWRA), the *Safe Drinking Water Act* (SDWA), the Drinking-Water Systems Regulation (O. Reg. 170.03) and the Environmental Bill of Rights, c. 28, Statutes of Ontario 1993 (EBR). This information will be used to evaluate applications for approval of municipal and private sewage works as required by Section 53 (OWRA) and to evaluate applications for approval of municipal and non- municipal drinking-water systems as required by Sections 31, 36, 38, 52 and 60 of the SDWA.

Instructions

1. This form should accompany all Applications for a Water and Sewage Works. It does not replace the Application form for a Certificate of Approval and is required in addition to the supporting technical information described in the Guide for Applying for Municipal and Private Water and Sewage Works. All designs are expected to be in accordance with MECP design guidelines and the 10 State Standards.

2. The information contained in this form and the required supporting stamped engineering drawings are the minimum information requirements used to process the application for a Certificate of Approval. All sections MUST be filled out and incomplete forms will be RETURNED to the applicant. If the design does not meet the MECP design guidelines and the 10 State Standards, please explain why and how the issue will be addressed. Additional information may be requested during the review process.

3. Application forms and supporting documentation are available from the Client Services and Permissions Branch (CSPB) toll free at 1-800-461-6290 (locally at 416-314-8001), from your local District Office of the Ministry of the Environment, Conservation and Parks, and in the "Publications" section of the Ministry of the Environment, Conservation and Parks website at https://www.ontario.ca/page/water-and-sewage-works-approvals-sample-applications-guides-and-resources

4. Questions regarding completion and submission of this data form should be directed to the Client Services and Permissions Branch (CSPB), 135 St. Clair Avenue West, 1st Floor, Toronto ON M4V 1P5, 1-800-461-6290 or 416-314-8001, or to your local District Office of the Ministry of the Environment, Conservation and Parks.

Information for Proponents Applying for a ECA for Water and Sewage Works

Section 53 of the *Ontario Water Resources Act* R.S.O. 1990 and Part V of the *Safe Drinking Water Act* require that anyone who establishes, alters, extends or replaces new or existing water or sewage works do so only in accordance with approval granted by the Director. As a result, any plans to change watermains, storm sewers, sanitary sewers, or combined sewers must first be granted a Certificate of Approval (works which are exempt from Certificate of Approval requirements are detailed in Ontario Regulation 525/98). Detailed information on approval requirements and procedures are contained in separate documents entitled "Guide for Applying for Approval of Municipal and Private Water and Sewage Works (Section 53 *Ontario Water Resources Act* R.S.O. 1990)" and "Guide For Applying For Approvals Related To Municipal And Nun-Municipal Drinking-Water-Systems – Parts V and VI of the *Safe Drinking Water Act* and Drinking-Water Systems Regulation" These documents are available on the Ministry of the Environment, Conservation and Parks website (https://www.ontario.ca/page/water-and-sewage-works-approvals-sample-applications-guides-and-resources) or can be obtained by contacting a client services representative at 413-314-8001.

Criteria for Approval – Water and Sewage Works

The anticipated environmental impacts of water and sewage works are land and water contamination, or overflow causing physical damage, or resulting in adverse effects. Generally, these impacts can be minimized by the appropriate design installation, operating and maintenance of the water and sewage pipes. There are a number of guideline assessment criteria, which will be explained in this data form, and which can be read in greater detail in the following guidelines:

- Guidelines for the design of water distribution systems, Ministry of the Environment, 1985
- Guidelines for the design of sanitary sewage systems, Ministry of the Environment, 1985
- Interim guidelines for the design of storm sewer systems, Ministry of the Environment, 1985
- Procedure for the Determination of Treatment Requirements for Municipal and Private Combined and Partially Separated Sewer Systems (Procedure F-5-5)
- Procedures to govern separation of sewers and watermains (Procedure F-6-1)

 © Queen's Printer for Ontario, 2021

Cette publication hautement spécialisée {Pipe Data Form - Watermain, Storm Sewer, Sanitary Sewer, and Forcemain Design Supplement to Application for Approval for Water and Sewage Works} n'est disponible qu'en anglais conformément au Règlement 671/92, selon lequel il n'est pas obligatoire de la traduire en vertu de la *Loi sur les services en français*. Pour obtenir des renseignements en français, veuillez communiquer avec le Ministère de l'Environnement, de la Protection de la nature et des Parcs au 416-314-8001 ou par courriel à enviropermissions@ontario.ca.

1.0 General Project Information

1.1 Site Name

Cassette Subdivision - 2275 Mer-Bleue Road

1.2 Municipality

City of Ottawa

Client (if different from Municipality)

Caivan (Mer Bleu) Inc.

1.3 Type of Works Project (Please check all that apply)

- ☐ Watermain Please complete Sections 1.0 to 5.0 of this form
- ☑ Storm Sewer Please complete Sections 1.0 to 4.0, 6.0 and Appendix A of this form
- ☑ Sanitary Sewer Please complete Sections 1.0 to 4.0, 7.0 and Appendix B of this form
- ☐ Forcemain Please complete Sections 1.0 to 4.0, 8.0 and Appendix C of this form

1.4 (a) Project Purpose (Please check all that apply)

- ☐ Replacement
- ☐ Increased demand
- ☐ Connecting existing lines
- ☑ New development
- ☐ Other (specify) _____

2.0 Environmental Assessment Act Requirements

2.1 Is this a private sector project?

☑ Yes ☐ No If 'No', please complete 2.2 and 2.3

2.2 (a) Choose applicable Municipal sector Class EA Schedule

- ☐ Schedule A
- ☐ Schedule B
- ☐ Schedule C

(b) From the appropriate Schedule identified in 2.2(a), please identify Project Type and associated Schedule/Paragraph No. which applies to the proposed project

- ☐ Water Project
- ☐ Wastewater Project Schedule Number _____

For 'Schedule B' please complete 2.3(a),(b) For 'Schedule C', please complete 2.3(a),(b),(c)

2.3 (a) Has a Notice of Completion been submitted along with this application?

☐ Yes ☐ No

(b) Were any Part II Orders (ie "Bump-up" requests) received for this project?

☐ Yes ☐ No If 'Yes', please provide details:

(c) Has an Environmental Study Report (ESR) been completed?

☐ Yes If 'Yes', please include ESR Cover page with this submission ☐ No

3.0 Drawings

Note: All drawings must include an accurate scale and be stamped by a Professional engineer. If the drawing is of a large scale where small separation distances cannot be easily measured, these distances must be marked on the drawing or noted as a typical separation.

Have the following details been included with this submission?

- [x] Site Plan, including
  - [x] Proposed works
  - [x] Existing works (as appropriate)
  - [x] Property lines/Municipal boundaries
  - [x] Any water bodies in proximity to the works
- [x] Plan and Profile of all Pipes
  - [x] Horizontal distance between watermains and sewers
  - [x] Vertical distance between watermains and sewers
  - [x] Length, diameter and slope of each pipe segment
  - [x] Locations of valves, valve chambers if > 300mm diametre, pressure reducers, tees, etc
  - [x] Location of manholes (and their respective IDs)
- [x] Storm Drainage Area
  - [x] Indicate all areas which drain into the proposed works
  - [x] Physical area in hectares
  - [x] Runoff Coefficient for each drainage area
  - [x] Storm water drainage path
- [x] Sanitary Drainage Area
  - [x] Indicate all areas which drain into the proposed works
  - [x] Physical area in hectares
  - [x] Population for each drainage area
  - [x] Sanitary Sewer drainage path
- [ ] Other Details
  - [ ] Typical separations, where not easily measured from pipe drawings
  - [ ] Appertunances
  - [ ] Municipal drains

4.0 Additional Information

4.1 Are the proposed works laid below the frost penetration depth for the area at all points?

- [x] Yes [ ] No

4.2 (a) Are all existing and proposed watermains separated by at least 2.5 m of clear horizontal distance from all existing and proposed sewers and storm water conveyance systems (ie. ditches)?

- [x] Yes [ ] No

(b) Are all existing and proposed watermains separated by at least 0.5 m of clear vertical distance higher than all existing and proposed sewers and storm water conveyance systems (ie. ditches)?

- [x] Yes [ ] No

(c) Are all existing and proposed sewers, including all drains and similar sources of contamination, separated by at least 15 metres from potable water reservoirs below normal ground surface and well supplies?

- [x] Yes [ ] No

If 'No' to any part of Question 4.0, please refer to Procedure F-6-1 for solutions to prevent contamination when separation distances cannot be met

5.0 Watermains

For Questions 5.1 to 5.3, please attach an additional sheet if necessary

5.1 Description of Proposed Watermain(s) (including service area/development)

5.2 Description of Existing Works (in proximity to proposed works)

5.3 For each watermain, please provide the following details in the chart below (or equivalent)

Street	From (street/manhole)	To (street/manhole)	Diameter (mm)	Roughness

5.4 Are all of the watermains a minimum of 150 mm in diameter?

☐ Yes ☐ No

5.5 What is the expected operating pressure range for this watermain under maximum day demand?

_____ to _____ (please indicate units)

5.6 (a) Will the watermain pressure drop below 275 kPa (40 psi)?

☐ Yes ☐ No

If 'Yes', please provide an explanation for this situation and future plans to address the problem

(b) Is there sufficient pressure (138 kPA or 20 psi) reserved for fire flow/protection?

☐ Yes ☐ No

5.7 If this is a feedermain or a pipe dedicated to transporting potable water only (ie. having no service connections), have hydraulic transients been considered?

☐ Yes ☐ No

If 'Yes', please describe the results

5.8 (a) Are there any dead end points in the system?

☐ Yes ☐ No If 'Yes', then please complete 5.8(b)

(b) How will water stagnation be addressed?

☐ Fire Hydrants ☐ Blow-off point ☐ Other (Specify) _____

5.9 (a) Are there any tee- or cross-connections?

☐ Yes ☐ No If 'Yes', then please complete 5.9(b)

(b) Are there at least two (2) shut-off valves at each tee-connection, and at least three (3) shut-off valves at each cross-connection?

☐ Yes ☐ No

If 'No', how will disruptions to the system be minimized during repairs or emergencies?

6.0 Storm Sewers

For Questions 6.1 to 6.3, please attach an additional sheet if necessary

6.1 Description of Proposed Storm Sewer(s) (including service area/development)

Proposed new storm sewers and all related appurtenances to service the Cassette Subdivision located at 2275 Mer-Bleue Road in the Cumberland Ward. Proposed storm sewers collect flows from the subdivision and discharge to the existing 975mm dia. storm sewers stubs from both Sculpin St and Aquarium Drive. Existing Minto Avalon Development infrastructure conveys flow to the existing Avalon West (Neighborhood 5) Stormwater Management Pond (ECA #6142-BEJHCE, dated August 1, 2019).

6.2 Is this application for approval a part of a larger and/or phased development?

☐ Yes ☑ No

If 'Yes', please provide full details on any existing developments including all Certificates of Approval that have been approved or application that are currently under review. Clearly indicate in all stamped engineering drawings and reports which developments belong to which phase and whether they are existing, for current development, or for future development

6.3 Description of Existing Works (in proximity to proposed works)

Existing 975mm dia. storm sewers stubs from both Sculpin St and Aquarium Drive. Existing Minto Avalon Development storm sewer infrastructure conveys flow to the existing Avalon West (Neighborhood 5) Stormwater Management Pond (ECA #6142-BEJHCE, dated August 1, 2019).

6.4 For each storm sewer, please provide the following details in the chart below (or equivalent)

Street	From (street/manhole)	To (street/manhole)	Diameter (mm)	Roughness
Please refer to the	attached storm sewer	description sheet.		

6.5 Has the Storm Sewer Hydraulic Design Sheet (or equivalent) been included with this submission? (refer to the Guidance Document in Appendix A)

☑ Yes ☐ No

6.6 Please indicate which land use surface types are included in the drainage area and list the runoff coefficient(s) used for each type

	Surface Type	Recommended	Used
☑	Asphalt, concrete, roof areas	0.90 - 1.00	0.90
☐	Gravel	0.80 - 0.85	
☑	Grassed areas, parkland	0.15 - 0.35	0.20
☐	Commercial	0.75 - 0.85	
☐	Industrial	0.65 - 0.75	
☐	Single family dwelling	0.40 - 0.45	
☐	Semi-detached	0.45 - 0.60	
☐	Row housing, Townhousing	0.50 - 0.70	
☐	Apartments	0.60 - 0.75	
☐	Institutional	0.40 - 0.75	
☐	Other		

If USED runoff coefficient does not fall within the RECOMMENDED range, please provide rationale below:

6.7 (a) What is the full flow velocity range for all storm sewers in the proposed works?

0.80 to 1.05 m/s

(b) If the full flow velocity is outside of the range of 0.8 m/s to 6.0 m/s, what measures will be employed to reduce sediment build up and/or erosion in the pipe?

6.8 (a) What is the municipality's requirement for the minor design storm event?

☑ 2 year ☐ 5 year ☐ 10 year ☐ Other

(b) What storm event has been used for the design of the proposed works?

☑ 2 year ☐ 5 year ☐ 10 year ☐ Other

(c) Are there any inlet control devices (ICDs) proposed in the catch basins?

☑ Yes ☐ No

6.9 Please indicate the first destination/location that will be receiving the storm water:

☐ Natural Water Body

Name

Has the Conservation Authority granted approval to discharge to this water body?

☐ Yes ☐ No

☐ Storm Water Management (SWM) Facility

Name

Certificate of Approval Number (if applicable) OR

Application Reference Number (if submitted)

Has the Operating Authority (of the SWM facility) granted approval to discharge to this facility?

☐ Yes ☐ No

☐ Municipal Drain

☑ Existing Sewers

7.0 Sanitary Sewers

For Questions 7.1 to 7.3, please attach an additional sheet if necessary

7.1 Description of Proposed Sanitary Sewer(s) (including service area/development)

Proposed residential development serviced by conventional gravity sanitary sewer system.

7.2 Description of Existing Works (in proximity to proposed works)

Proposed sewers outlet to existing 200mm dia. sewer stubs to the site boundary from Sculpin St & Aquarium Ave.

7.3 For each sewer, please provide the following details in the chart below (or equivalent)

Street	From (street/manhole)	To (street/manhole)	Diameter (mm)	Roughness	
Please refer to the	attached sanitary sewer	description sheet			

7.4 Has the Sanitary Sewer Design Sheet (or equivalent) been included with this submission? (refer to Guidance Document in Appendix B)

☐ Yes ☐ No

7.5 Please indicate which sewage types are applicable in the drainage area and list the daily design flows used in the pipe design for each type.

	Sewage Type	Recommended	Used
☑	Domestic	225 - 450 L/cap/day	280 L/cap/day

	Sewage Type	Recommended	Used
☐	Hospitals	900 - 1800 L/bed/day	
☐	Schools	70 - 140 L/student/day	
☐	Trailer Parks	340 - 800 L/space/day	
☑	Infiltration	0.1 - 0.28 L/ha/s	0.33 L/ha/s
☐	Industrial	35 - 55 m3/ha/day	
☐	Shopping Centres	2500 - 5000 L/1000 m2/day	
☐	Hotels/Motels	150 - 225 L/bed space/day	
☑	Other		

If USED sewage daily design flow does not fall within the RECOMMENDED range, please provide rationale below

7.6 (a) What is the full flow velocity range for all sanitary sewers in the proposed works?

0.62 to 0.84 m/s

(b) If the full flow velocity is outside of the range of 0.6 m/s to 3.0 m/s, what measures will be employed to reduce sewage build up and/or erosion in the pipe?

7.7 It is recommended that sanitary sewers be laid at sufficient depth to receive gravity flow from basements. Are any sanitary sewers above the depth of any basements in the area?

☐ Yes ☑ No

If 'Yes', what methods will be employed to prevent sewage backup into basements?

8.0 Forcemains

For Questions 8.1 to 8.3, please attach an additional sheet if necessary

8.1 Description of Proposed Forcemain(s) (including service area/development)

8.2 Description of Existing Works (in proximity to proposed works)

8.3 For each forcemain, please provide the following details in the chart below (or equivalent)

Street	From (street/manhole)	To (street/manhole)	Diameter (mm)	Roughness	

8.4 (a) Is there an existing ECA for the pumping station associated with this forcemain?

☐ Yes ☐ No

If 'Yes', please provide the Certificate of Approval Number: _____

If 'No', please complete 8.4(b)

(b) Please provide the pumping station design elements by completing Tables 1, 2, and 3 in Appendix C. Have Tables 1, 2, and 3 been included with this submission?

☐ Yes ☐ No

8.5 If this system is not a grinder pump system, is the minimum pipe size at least 100 mm to allow for the passage of small solids?

☐ Yes ☐ No

If 'No', please indicate below which methods will be employed to prevent a blockage in the pipe

8.6 (a) What is the velocity range for all forcemains in the proposed works?

_____ to _____ m/s

(b) If the velocity falls outside of the range of 0.8 m/s to 2.5 m/s, what measures will be employed to reduce sewage build up and/or erosion in the pipe?

8.7 Have the effects of hydraulic transient been considered?

☐ Yes ☐ No

If 'Yes', please indicate the results below

Appendix A - Sample Template

Storm Sewer Hydraulic Design Sheet

Site location (City)	n=	Checking Date (yyyy/mm/dd)
Ref #	Reviewer	

Design Storm: The _____ Year Storm Event

Rational Formula: Q = 2.78*CIA
Where: Q: peak flow (L/s)
C: runoff coefficient
I: rainfall intensity (mm/h)
A: area (ha)

Concentration time: tc = ti + tf (minute)
Where: ti: inlet time before pipe (minute)
tf: time of flow in pipe (minute)
tf = L/(60V) (minute)

Manning Equation:
Qcap. = (D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coefficient

			Runoff							**Pipe**						
Street Name	**From (MH/CB)**	**To (MH/CB)**	Area (A) (ha)	Runoff Coefficient (C)	Section (AC) (ha)	Accum. (AC) (ha)	Concentration time (tc) (min.)	Rainfall Intensity (I) (mm/hr)	Peak Flow (Q) (L/s)	Length (L) (m)	Slope (S) (%)	N. D. (D) (mm)	Qcap. (full) (L/s)	V (full) (m/s)	Time of flow in pipe (min.) (tf)	(Q) / Qcap.

Note: This table has been provided as a reference template only. Applicants are encouraged to use this sample template as an example when creating their own Storm Sewer Hydraulic Design Sheet.

Appendix B - Sample Template

Sanitary Sewer Design Sheet

Site location (City)	n=	Checking Date (yyyy/mm/dd)
Ref #	Reviewer	

Residential Unit average daily flow (q): _____ L/cap.d (225~450 L/cap.d) Unit extraneous flow (E): _____ L/s/ha (0.1-0.28L.s.ha)

q = average daily per capita flow (L/cap.d)
I = Unit of peak extraneous flow (L/s/ha)
Q(p) = peak population flow (L/s)
Q(I) = peak extraneous flow (L/s)
Q(d) = peak design flow (L/s)

Peaking Factor:
M =1+14/(4+(P/1000)^0.5)
Q(p) = (P/1000)qM/86.4 (L/s)
Q(I) = IA (L/s); where A = Area in hectares
Q(d) = Q(p) + Q(I) (L/s)

Manning Equation:
Qcap. = (D/1000)^2.667*(S/100)^0.5/(3.211*n)*1000 (L/s)
D: pipe size (mm)
S: slope (grade) of pipe (%)
n: roughness coefficient

			Inlet Flow								Pipe					
Location			**Individual**		**Accumulative**		**Peaking**	**Pop.**	**Extran.**	**Design**	**Length**	**Size**	**Slope**	**Capacity**	**Velocity**	
Street Name	**From (MH)**	**To (MH)**	P (person)	Area (ha)	P (person)	Area (ha)	Factor (M)	Q(p) (L/s)	Q(e) (L/s)	Q(d) (L/s)	L (m)	D (mm)	S (%)	Qcap. (L/s)	V (m/s)	Q(d)/ Qcap

Note: This table has been provided as a reference template only. Applicants are encouraged to use this sample template as an example when creating their own Sanitary Sewer Design Sheet.

Table 1 (H-1 of APPENDIX H)

Sewage Pumping Station Design – Table 1

Municipality

Pumping Station

Designed by | Date (yyyy/mm/dd)

Design Subject		Unit	Initial Period	10 Year Period	20 Year Period	Ultimate Period
Tributary	A) Residential	ha				
	B) Commercial	ha				
	C) Industrial	ha				
Population Density		Pers/ha				
Population or Equivalent	A) Residential	No.				
	B) Commercial	No.				
	C) Industrial	No.				
Per Capita Flow		L/cap.d				
Average Flow		L/s				
Peak Flow Factor*						
Peak Domestic Flow		L/s				
Infiltration Rate		L/ha.s				
Infiltration Flow		L/s				
Design Peak Flow		L/s				
Pumps		No.				
Pump Discharge		L/s				
Force Main Diameter		mm				
Velocity		m/s				

Note: * The peak flow factor is: 1+14/(4+P^0.5), where P is designed population, in thousand.

Table 2 (H-2 of APPENDIX H)

Sewage Pumping Station Design – Table 2

Municipality

Pumping Station

Designed by	Date (yyyy/mm/dd)

Design Subject	Unit	C=120	C=130	C=140
Pump Design Flow	L/s			
Forcemain Diam.	mm			
Velocity	m/s			
Forcemain Length	m			
Forcemain Head Loss	m			
Suction Line Head Loss	m			
Discharge Line Head Loss	m			
Total Head Loss	m			
Low Water Level Wet Well	m			
High Water Level Wet Well	m			
Forcemain End Elevation	m			
Static Head Max.	m			
Static Head Min.	m			
Total Danamic Head Max.	m			
Total Danamic Head Min.	m			

Table 3 (Abstracted from Appendix I)

Information Required for Sewage Pumping Stations Applications

Standby Power Supply

Is standby power required?

☐ Yes ☐ No

If yes, what kind of standby power is available for this pumping station?

☐ a) Standby Generator ☐ b) Portable Generator ☐ c) Additional hydro feed line

Receiving Watercourse

Will sewage be overflow/bypass any receiving watercourse?

☐ Yes ☐ No

If yes, then:

a) It will be necessary to know in detail the route by which overflow/bypass flow would gain access to the watercourse?

_____

b) The flow in the receiving watercourse at the point of overflow/bypass from the pumping station is as follows:

_____ flow in dry weather (m^3/s)

_____ flow in wet weather (m^3/s)

c) The nearest water intake is located on the receiving watercourse within

_____ metres of the point of entry of the overflow.

Sewage Pumping Station

a) The operating authority responsible for maintenance and operation of this pumping station is

_____

b) The high level alarm is set up to relay a signal to _____

c) Between the time of activation of the high level alarm and the overflow/basement flooding, there are:

_____ m^3 of storage capacity available in the sewers;

_____ m^3 of storage capacity available in the pumping station.

d) This storage will provide:

_____ minutes retention before overflow/basement flooding occurs at the average daily design flow of _____ L/s;

and _____ minutes retention before overflow/basement flooding occurs at the peak design flow of _____ L/s;

e) It is possible to bypass or pump around the pumping station with portable equipment by utilizing the following procedure

_____

7. Authorization

7.1 Statement of the Applicant

I am authorized to prepare and submit this application and to make this certification. I have reviewed the complete application and I have made all inquiries that are necessary to declare to the best of my knowledge, information and belief:

- The information contained in this application is complete and accurate.
- The Technical Contact(s) identified in this application has/have been authorized to prepare certain technical material, and act on behalf of the applicant to discuss this application with the Ministry of the Environment and Climate Change and to provide additional information about this application to the Ministry on request.
- The information provided to the Technical Contact(s) in relation to this application is complete and accurate.

Name of Signing Authority (Please print) *
Hugo Lalonde

Title *
Director, Land Development

Telephone Number	Mobile Number	Fax Number
613-295-5082 ext.		

Email Address
hugo.lalonde@caivan.com

Signature	Date (yyyy/mm/dd)
Hugo Lalonde	2022/08/17

✓ Completion Status (7.1 Statement of the Applicant)

7.2 Statement of the Municipality ☐ N/A

I, the undersigned hereby declare on behalf of the Municipality, that the Municipality has no objection to the construction of the works in the Municipality.

Name (Please print) *
.Natasha Baird

Title *	Name of Municipality *
Senior Engineer - Development Review	Ottawa

Signature	Date (yyyy/mm/dd)
Natasha Baird	2022/08/17

✓ Completion Status (7.2 Statement of the Municipality)

7.3 Statement of Technical Contacts

Technical Contact 1

I have been authorized by the applicant to prepare the technical materials for the area(s) of responsibility identified in section 2.6 that are included in the application. I have reviewed those technical materials and I have made all inquiries that are necessary to declare to the best of my knowledge, information and belief:

- The technical materials contained in this application in respect of the area(s) of responsibility identified in section 2.6 are complete and accurate.
- I have the relevant education and experience necessary to provide this certification.

Name of Technical Contact (Please print) *
Kevin L. Murphy

Signature	Date (yyyy/mm/dd)
Kevin Murphy	2022/08/17

✓ Completion Status (7.3 Statement of Technical Contacts)

STORM SEWER DESCRIPTION

STORM SEWERS to be constructed within Cassette Subdivision at 2275 Mer-Bleue Road, as follows:

STREET	FROM:	TO:	SIZE	MATERIAL
Ryan Reynolds Way	Ryan Reynolds Way (north leg) STA. 0+001.946	Ryan Reynolds Way (south leg) STA. 0+636.828	375 mm 450 mm 525 mm 600 mm 675 mm 750 mm	PVC CONC CONC CONC CONC CONC
Broadcast Avenue	15m East of Mer-Bleue Road STA. 0+033.752	Ryan Reynolds Way STA. 0+122.083	450 mm	CONC
Block 28	Ryan Reynolds Way STA. 0-002.111	Block 28 Existing 975mm Storm Sewer STA. 0+027.028	750 mm	CONC
Sculpin Street	Ryan Reynolds Way STA. 0+129.953	Existing Sculpin Street 975mm Storm Sewer STA. 0+159.177	675 mm	CONC

© DSEL

STORM SEWER DESCRIPTION

STORM SEWERS to be constructed within Cassette Subdivision at 2275 Mer-Bleue Road, as follows:

STREET	FROM:	TO:	SIZE	MATERIAL
Ryan Reynolds Way	Ryan Reynolds Way (north leg) STA. 0+001.946	Ryan Reynolds Way (south leg) STA. 0+636.828	375 mm 450 mm 525 mm 600 mm 675 mm 750 mm	PVC CONC CONC CONC CONC CONC
Broadcast Avenue	15m East of Mer-Bleue Road STA. 0+033.752	Ryan Reynolds Way STA. 0+122.083	450 mm	CONC
Block 28	Ryan Reynolds Way STA. 0-002.111	Block 28 Existing 975mm Storm Sewer STA. 0+027.028	750 mm	CONC
Sculpin Street	Ryan Reynolds Way STA. 0+129.953	Existing Sculpin Street 975mm Storm Sewer STA. 0+159.177	675 mm	CONC

© DSEL

SANITARY SEWER DESCRIPTION

SANITARY SEWERS to be constructed within Cassette Subdivision at 2275 Mer-Bleue Road, as follows:

STREET	FROM:	TO:	SIZE	MATERIAL
Ryan Reynolds Way	Ryan Reynolds Way (north leg) STA. 0+000.00	Ryan Reynolds Way (south leg) STA. 0+638.999	200 mm	PVC
Broadcast Avenue	16m East of Mer Bleue Road STA. 0+020.00	Ryan Reynolds Way STA. 0+120.00	200 mm	PVC
Block 28	Ryan Reynolds Way STA. 0+000.000	Block 28 Existing 200mm Sanitary Sewer STA. 0+025.112	200 mm	PVC
Sculpin Street	Ryan Reynolds Way STA. + 060.00	Existing Sculpin Street 200mm Sanitary Sewer STA. 0+010.00	200 mm	PVC

© DSEL

SANITARY SEWER DESCRIPTION

SANITARY SEWERS to be constructed within Cassette Subdivision at 2275 Mer-Bleue Road, as follows:

STREET	FROM:	TO:	SIZE	MATERIAL
Ryan Reynolds Way	Ryan Reynolds Way (north leg) STA. 0+000.00	Ryan Reynolds Way (south leg) STA. 0+638.999	200 mm	PVC
Broadcast Avenue	16m East of Mer Bleue Road STA. 0+020.00	Ryan Reynolds Way STA. 0+120.00	200 mm	PVC
Block 28	Ryan Reynolds Way STA. 0+000.000	Block 28 Existing 200mm Sanitary Sewer STA. 0+025.112	200 mm	PVC
Sculpin Street	Ryan Reynolds Way STA. + 060.00	Existing Sculpin Street 200mm Sanitary Sewer STA. 0+010.00	200 mm	PVC

© DSEL

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 6142-BEJHCE
Issue Date: August 1, 2019

Minto Communities Inc.
180 Kent Street, Unit 200
Ottawa, Ontario
K1P 0B6

Site Location: Avalon West (Neighbourhood 5) Stormwater Management Pond Expansion
Part of Lot 4, Concession 11 (Cumberland)
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

modifications to existing stormwater management Works to serve Summerside South - Phase 1 development, located in the City of Ottawa, for the collection, transmission, treatment and disposal of stormwater runoff from a total catchment area of 255.90 hectares, to provide Enhanced Level water quality protection and erosion control, and to attenuate post-development peak flows to pre-development peak flows for all storm events up to and including the 100-year storm event, discharging to McKinnon's Creek, consisting of the following:

- **stormwater management facility (catchment area 255.90 hectares):** wet pond expansion with one (1) new sediment forebay, located south of Brian Coburn Boulevard, between Tenth Line Road and Mer Bleue Road, having a permanent storage volume of 106,087 cubic metres, an extended detention volume of 20,511 cubic metres, and a total storage volume of 217,211 cubic metres including the permanent pool, at a total depth of 3.60 metres, an additional outlet structure comprised of a 3.5 metre long concrete weir equipped with a 1,200 millimetre diameter storm outlet pipe, allowing a maximum discharge of 12,900 litres per second and 17,476 litres per second under the 100-year storm event to Points C and E, respectively, in McKinnon's Creek, located immediately behind Blocks 118 to 128, and Blocks 482 and 485;

Previous Works:

- **grassed swale:** a 300 metre long grassed conveyance ditch constructed on municipal land from the outlet of the existing Western Trunk Storm Sewer, designed to accommodate the run-off up to the 100-year storm

event from a catchment area of 6.59 hectares, having a maximum ponding depth of 1.61 metres, a bottom width of 1 metre, a top width of 24 metres, and 3:1 side slopes, complete with an inlet rip-rap lined 20 metres long and 10 metres wide plunge pool, discharging to the sediment forebay of the stormwater management facility;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

Definitions:

1. "Approval" means this entire document and any schedules attached to it, and the application;

2. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

3. "District Manager" means the District Manager of the appropriate local District Office of the Ministry, where the Works are geographically located;

4. "EPA" means the *Environmental Protection Act,* R.S.O. 1990, c.E.19, as amended;

5. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

6. "Owner" means Minto Communities Inc., and includes its successors and assignees;

7. "OWRA" means the *Ontario Water Resources Act, R.S.O. 1990, c. O.40* , as amended;

8. "Previous Works" means those portions of the sewage Works previously approved under an Approval;

9. "Works" means the sewage Works described in the Owner's application, and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

4. Where there is a conflict between the documents listed in Schedule "A" and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

5. The conditions of this Approval are severable. If any condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This Approval will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this Approval.

2. In the event that completion and commissioning of any portion of the Works is anticipated to be delayed beyond the specified expiry period, the Owner shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of Approval of the Works are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of Owner;

b. change of address of the Owner;

c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act,* R.S.O. 1990, c.B17 shall be included in the notification to the District Manager; or

d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act,* R.S.O. 1990, c. C39 shall be included in the notification to the District Manager.

2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

3. The Owner shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

2. The Owner shall make all necessary investigations, take all necessary steps and obtain all necessary approvals so as to ensure that the physical structure, siting and operations of the Works do not constitute a safety or health hazard to the general public.

3. The Owner shall inspect and ensure that the design minimum liquid retention volume is maintained in the Works at all times, except when maintenance is required.

4. The Owner shall undertake an inspection of the condition of the Works, at least once a year, and undertake any necessary cleaning and maintenance to ensure that sediment, debris and excessive decaying vegetation are removed from the Works to prevent the excessive build-up of sediment, oil/grit, debris and/or decaying vegetation, to avoid reduction of the capacity and/or permeability of the Works, as applicable. The Owner shall also regularly inspect and clean out the inlet to and outlet from the Works to ensure that these are not obstructed.

5. The Owner shall construct, operate and maintain the Works with the objective that the effluent from the Works is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen,

foam or discoloration on the receiving waters.

6. The Owner shall maintain a logbook to record the results of these inspections and any cleaning and maintenance operations undertaken, and shall keep the logbook at the Owner's administrative office for inspection by the Ministry. The logbook shall include the following:

   a. the name of the Works; and

   b. the date and results of each inspection, maintenance and cleaning, including an estimate of the quantity of any materials removed and method of clean-out of the Works.

7. The Owner shall prepare an operations manual prior to the commencement of operation of the Works that includes, but is not necessarily limited to, the following information:

   a. operating and maintenance procedures for routine operation of the Works;

   b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

   c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;

   d. contingency plans and procedures for dealing with potential spills and any other abnormal situations and for notifying the District Manager; and

   e. procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

8. The Owner shall maintain the operations manual current and retain a copy at the Owner's administrative office for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

5. TEMPORARY EROSION AND SEDIMENT CONTROL

1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to

maintain the temporary sediment and erosion control measures.

6. REPORTING

1. One (1) week prior to the start-up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start-up date.

2. The Owner shall, upon request, make all reports, manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

3. The Owner shall prepare a performance report within ninety (90) days following the end of the period being reported upon, and submit the report(s) to the District Manager when requested. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be prepared to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

   a. a description of any operating problems encountered and corrective actions taken;

   b. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works, including an estimate of the quantity of any materials removed from the Works;

   c. a summary of any complaints received during the reporting period and any steps taken to address the complaints;

   d. a summary of all spill or abnormal discharge events; and

   e. any other information the District Manager requires from time to time.

7. RECORD KEEPING

1. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the operation, maintenance and monitoring activities required by this Approval.

Schedule "A"

1. Application for Environmental Compliance Approval, dated June 28, 2019, received on July 4, 2019, submitted by Minto Communities Inc.;

2. Transfer of Review Letter of Recommendation, dated June 28, 2019. revised on July 24, 2019, and signed by Jeff McEwen, P. Eng., Manager, Development Review East Branch, City of Ottawa, including the following supporting documents:

   a. Final Plans and Specifications prepared by David Schaeffer Engineering Ltd.

   b. Stormwater Management Report prepared by David Schaeffer Engineering Ltd.

3. Email received on July 19, 2019 from Jeff McEwen, P. Eng., City of Ottawa.

4. Email received on July 23, 2019 from Kate Anderson, E.I.T., David Schaeffer Engineering Ltd.

5. Emails received on July 22, 2019, July 24, 2019, and July 30, 2019 from Will Curry, C.E.T., City of Ottawa.

6. Emails received on July 30, 2019 from Jennifer Ailey, P. Eng., David Schaeffer Engineering Ltd.

7. Application for Approval of Municipal and Private Sewage Works, dated August 13, 2007, with cover letter and Attachments 2, 3, and 4 from Charles Warnock, Program Manager, Infrastructure Approvals, City of Ottawa, dated October 4, 2007 and received on October 9, 2007;

8. Taggart Realty Management: Neighbourhood 5 - East Urban Community Interim Stormwater Management Report, prepared by IBI Group, dated July 2007 and received on August 14, 2007;

9. Set of engineering drawings for Neighbourhood 5 Interim SWM Facility, (Contract No. 12130), prepared by IBI Group, dated July 2007;

10. Revised Drawing No. 100A, Neighbourhood 5 Interim SWM Facility, (Project No. 12130), prepared by IBI Group, dated April 7, 2008;

11. Letter from Robert W. Wingate of IBI Group to the Ministry, dated November 9, 2007;

12. Letter from Peter Deir of IBI Group to the Ministry, dated November 13, 2007;

13. Letter from Ted Phillips of Taggart Investments to the Ministry, dated December 18,

2007;

14. Written procedure issued March 6, 2008 and cosigned by Robert W. Wingate of IBI Group and Ted Edward Phillips of Taggart Realty;

15. Application for Approval of Municipal and Private Sewage Works, dated November 6, 2009 and received on November 19, 2009, Neighbourhood 5 Phase II Interim Stormwater Management Report, dated August 2009, and drawings and addendum documents prepared and submitted by IBI Group;

16. Application for Approval of Municipal and Private Sewage Works, dated March 1, 2011 and received on March 5, 2011, and final plans and specifications prepared by IBI Group;

17. Application for Amended Environmental Compliance Approval, dated March 19, 2013 and received on March 21, 2013, submitted by the City of Ottawa;

18. Avalon West (Neighbourhood 5) Interim Stormwater Management Report, dated March 2013, prepared by IBI Group;

19. Engineering Drawings 104, dated February 27, 2012, and 700A, dated February 21, 2012, prepared by IBI Group;

20. E-mail from Rikke Brown of IBI Group to the Ministry, dated May 22, 2013;

21. E-mail from Rikke Brown of IBI Group to the Ministry, dated May 23, 2013;

22. Application for Environmental Compliance Approval, dated November 1, 2013 and received on January 7, 2014, submitted by the City of Ottawa;

23. Avalon West (Neighbourhood 5) Stormwater Management Facility Design, Revision 5, dated October 2013, prepared by IBI Group;

24. Set of Engineering Drawings (14 drawings) for Avalon West (Neighbourhood 5) SWM Facility, dated September 19, 2013, prepared by IBI Group;

25. Copy of letter from James Holland of South Nation Conservation to Minto Communities Inc., dated November 25, 2013;

26. E-mail from Peter Deir of IBI Group to the Ministry, dated July 9, 2014;

27. Application for Environmental Compliance Approval, dated June 8, 2015 and received on June 24, 2015, submitted by the City of Ottawa;

28. Stormwater Management Report for Summerside West Phase 1, dated June 2015,

prepared by J.F. Sabourin and Associates Inc.;

29. Copy of memorandum from IBI Group to David Schaeffer Engineering Ltd., dated November 3, 2014;

30. Copy of e-mail from Mathieu Leblanc of South Nation Conservation to David Schaeffer Engineering Ltd., dated June 23, 2015;

31. E-mail from Jennifer Ailey of David Schaeffer Engineering Ltd. to the Ministry, dated September 2, 2015;

32. E-mail from Peter Deir of IBI Group to the Ministry, dated September 17, 2015; and

33. E-mail from Jennifer Ailey of David Schaeffer Engineering Ltd. to the Ministry, dated September 30, 2015.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included as regular inspection and necessary removal of sediment and excessive decaying vegetation from the Works are required to mitigate the impact of sediment, debris and/or decaying vegetation on the treatment capacity of the Works. The Condition also ensures that adequate storage is maintained in the Works at all times as required by the design. Furthermore, this Condition is included to ensure that the Works are operated and maintained to function as designed.

5. Condition 5 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.

6. Condition 6 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

7. Condition 7 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 1339-A28J6Z issued on October 2, 2015.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 1st day of August, 2019

THIS APPROVAL WAS MAILED
ON AUG 0 2 2019
BY
(Signed)

A. Ahmed

Aziz Ahmed, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

CA/
c: District Manager, MECP Ottawa
Clerk, City of Ottawa
Jeff McEwen, P. Eng., Manager, Development Review East Branch, City of Ottawa
William Curry, C.E.T., Planning, Infrastructure and Economic Development, City of Ottawa
Brent Strachan, A.S.O., Minto Communities Inc.
Jennifer Ailey, David Schaeffer Engineering Ltd.

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 7375-A8QGEU
Issue Date: April 12, 2016

City of Ottawa
800 Green Creek Drive
Ottawa, Ontario
K1J 1K6

Site Location: Tenth Line Pump Station
2428 Tenth Line Road
Lot Pt. 3, Concession 11
Geographic Township of Cumberland
City of Ottawa

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

amendment to the wastewater infrastructure Works to include modifications in an existing sewage Works (identified under "Previous Works"), consisting of sanitary sewer, sewage pumping station and forcemain as follows:

Proposed Works:

Revisions to the Tenth Line Pump Station, consisting of the following:

- revised tributary drainage area to include the addition of 32 hectares (ha) of Mattamy Summerside West Lands, 23 ha of Minto Urban Expansion Lands and 15.6 Ha of future development lands (Mer Blue Expansion Area 10);

- installation of a new reversed slope 1050 mm diameter concrete sanitary overflow pipe (from Station 0+000.000 to Station 0+036.141) connecting existing sanitary MH 10128 to proposed storm MH 700, discharging overflow to the existing Avalon West (N5) Stormwater Management Pond;

- installation of a new 2400 mm diameter monitoring manhole for access to a velocity-area type flow meter for overflow monitoring that is connected to the sanitary pumping station and the City of Ottawa SCADA network;

- installation of an ultrasonic depth sensor in the existing sanitary MH 10128 that is connected to the sanitary pumping station and the City of Ottawa SCADA network;

- decommissioning of existing overflows from sanitary MH 512 on Harvest Valley Avenue, sanitary MH 284 on Frank Cauley Way and Sanitary MH 100A at the intersection of Brian Coburn Boulevard and Strasbourg Street;

Previous Works:

Inlet Gravity Sanitary Sewer

A 675 mm diameter inlet gravity concrete sanitary sewer constructed on Tenth Line Road servicing Avalon South Subdivision (N4), from Street 31 (80 m south of the pump station) and a stubbed section of gravity sewer for future connection from Neighbourhood 5 (N5) and the Bilberry Creek Industrial Park (BCIP);

Sewage Pump Station

A sanitary sewage pump station with a rated firm capacity of 425 L/s constructed to serve the N4, N5, and the BCIP, comprising of an in-ground cast-in-place wet well located on East side of Tenth Line Road, 2000 m south of Innes Road consisting of the following:

- A cast-in-place bypass chamber located immediately upstream of the wetwell, equipped with two (2) aluminium air vents, flushing connection, isolation valve, pump rails, and process piping;

- Sewage in-flow to the wetwell is directed through an aluminium trash basket;

- A cast-in-place wetwell equipped with three (3) 45 kW (60 HP) submersible pumps (two duty and one standby) of the non-clog type, each pump is capable of pumping up to 170 L/s in the smallest forcemain at 20 m TDH, complete with soft starters, an ultrasonic transducer for liquid level measurement and pump control together with a Multitrode sensor as backup;

- The wetwell is equipped with two (2) aluminum vents, complete with bird screens and one (1) external blower for ventilation;

- The valve room located in the basement is equipped with a common header, which splits into two forcemains (300 mm and 400 mm), equipped with two (2) electromagnetic flow meters, pressure surge relief valve, and swab launcher for forcemain cleaning;

- A 200 kW diesel engine generator set for standby power during emergencies located within the existing above ground control building, including a 1250 L capacity fuel storage facility located with a spill containment area;

- An offsite overflow connection located at the intersection of Street 6 and Street 31 from sanitary sewer (SAMH511) to the storm sewer (STMH543) with an emergency overflow float alarm at the wetwell;

- The control building has electrical and control equipment, including a new Supervisory Control and Data Acquisition (SCADA) system;

- The station is equipped with a 100 mm diameter watermain complete with backflow prevention for washroom facilities; yard hydrant and flushing connection in the bypass chamber constructed 300 mm above the overflow elevation;

Sewage Forcemains

Two parallel polyvinyl chloride (PVC) sanitary forcemains, 300 mm and 400 mm diameter, constructed from the control building to the west side of Tenth Line Road. The forcemains convey flow north 300 m to Street 45 (Vista Park Drive) in the Avalon South Subdivision, where the sewage outlets to a gravity trunk sewer;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

All in accordance with the submitted Environmental Compliance Approval (ECA) application dated (1) March 03, 2016, including all other supporting documents prepared by David Schaeffer Engineering Ltd., and (2) dated July 5, 2005, including all other supporting documents prepared by Stantec Consulting Limited, forming part of this approval.

For the purpose of this environmental compliance approval, the following definitions apply:

"Act" means the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended;

"Approval" means this entire document including the application and any supporting documents listed in any schedules in this Approval;

"BOD5" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"Director" means a person appointed by the Minister pursuant to section 5 of the Environmental Protection Act for the purposes of Part II.1 of the Environmental Protection Act;

"E. Coli" refers to the thermally tolerant forms of Escherichia that can survive at 44.5 degrees Celsius;

"Emergency Situation" means a structural, mechanical or electrical failure that causes a temporary reduction in the capacity of the Sewage Pumping Station or an unforeseen flow condition that may result in:

a) danger to the health or safety of any person; or
b) injury or damage to any property, or serious risk of injury or damage to any property.

"EPA" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;

"Event" in the context the Sewage Pumping Station located outside the Sewage Treatment Plant, means an

action or occurrence, at the Sewage Pumping Station that causes a Sewage Pumping Station Overflow. An Event ends when there is no recurrence of a Sewage Pumping Station Overflow in the 12-hour period following the last Sewage Pumping Station Overflow. Two Events are separated by at least 12 hours during which there has been no recurrence of a Sewage Pumping Station Overflow;

"Limited Operational Flexibility" (LOF) means the Modifications that the Owner is permitted to make to the Works under this Approval;

"Ministry" means the ministry of the government of Ontario responsible for the Environmental Protection Act and the Ontario Water Resources Act and includes all officials, employees or other persons acting on its behalf;

"Notice of Modifications" means the form entitled "Notice of Modifications to Sewage Works" included in Schedule "A";

"Owner" means City of Ottawa and includes its successors and assignees;

"Previous Works" means those portions of the sewage Works previously approved under an Approval;

"Professional Engineer" means a person entitled to practise as a Professional Engineer in the Province of Ontario under a licence issued under the Professional Engineers Act;

"Sewage Pumping Station Overflow" means any discharge from a Sewage Pumping Station located outside the Sewage Treatment Plant that does not undergo any treatment or only receives partial treatment before it is discharged to the environment;

"Substantial Completion" has the same meaning as "substantial performance" in the Construction Lien Act;

"Works" means the sewage works described in the Owner's application(s) and this Approval.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

(1) The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the Conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

(2) Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

(3) Where there is a conflict between a provision of any submitted document referred to in this Approval

and the Conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such Condition to other circumstances and the remainder of this Approval shall not be affected thereby.

(6) The issuance of, and compliance with the Conditions of this Approval does not:

(a) relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority necessary to construct or operate the sewage Works; or

(b) limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

2. EXPIRY OF APPROVAL

(1) This Approval will cease to apply to those parts of the Works which have not been constructed within **five (5) years** of the date of this Approval.

3. CHANGE OF OWNER

(1) The Owner shall notify the Director, in writing, of any of the following changes within **thirty (30) days** of the change occurring:

(a) change of Owner;

(b) change of address of the Owner;

(c) change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act, R.S.O. 1990, c. B17 shall be included in the notification to the Director;

(d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act, R.S.O. 1990, c. C39 shall be included in the notification to the Director.

4. UPON THE SUBSTANTIAL COMPLETION OF THE WORKS

(1) Upon the Substantial Completion of the Works, the Owner shall prepare a statement, certified by a Professional Engineer, that the Works are constructed in accordance with this Approval, and upon request, shall make the written statement available for inspection by Ministry personnel.

(2) Within **one (1) year** of the Substantial Completion of the Works, a set of as-built drawings showing the Works "as constructed" shall be prepared. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be retained at the Works for the operational life of the Works.

5. SEWAGE PUMPING STATION OVERFLOW

(1) Any Sewage Pumping Station Overflow is prohibited, except:

(a) in an Emergency Situation;

(b) where the Sewage Pumping Station Overflow is a direct and unavoidable result of a planned maintenance procedure, the Owner notified the Water Supervisor **fifteen (15) days** prior to the Sewage Pumping Station Overflow and the Water Supervisor has given written consent of the Sewage Pumping Station Overflow; or,

(c) where the Sewage Pumping Station Overflow is planned for research or training purposes, the discharger notified the Water Supervisor **fifteen (15) days** prior to the Sewage Pumping Station Overflow and the Water Supervisor has given written consent of the Sewage Pumping Station Overflow.

(2) The Owner shall forthwith notify the Spills Action Centre (SAC) at 1-800-268-6060 or e-mail at moe.sac.moe@ontario.ca and the Medical Officer of Health of every Sewage Pumping Station Overflow Events. This notice shall include, at a minimum, the following information:

(a) the date and time at which the Event(s) started,

(b) duration of the Event(s);

(c) the location of the Event(**s**);

(d) the measured or estimated volume of the Event(s) (unless the Event(s) is/are ongoing); and

(e) the reason for the Event (s).

(3) The Owner shall submit Sewage Pumping Station Overflow Event Reports to the Ministry's local office on an Annual basis, no later than forty-five (45) days following the end of the calendar year covered by the Event Report. Event Reports may be in an electronic format specified by the Ministry. In each Event Report the Owner shall include, at a minimum, the following information on any Event(s)

that occurred:

(a) the date and time at which the Event(s) started,

(b) duration of the Event(s);

(c) the location of the Event(**s**);

(d) the measured or estimated volume of the Event(s) (unless the Event(s) is/are ongoing); and

(e) the reason for the Event(s).

(4) The Owner shall use best efforts to collect a representative sample consisting of a minimum of two (2) grab samples of the Sewage Pumping Station Overflow and have it analysed for parameters outlined in Table 1 of Condition 7 (2) using the protocols specified in Condition 7 (3), one at the beginning of the Event and the second approximately near the end of the Event, to best reflect the effluent quality of such Sewage Pumping Station Overflow.

(5) The Owner shall maintain a record of all Sewage Pumping Station Overflow(s), which shall contain, at a minimum, the types of information set out in Condition 5 (2 a) to 5 (2 e) in respect of each Sewage Pumping Station Overflow.

6. OPERATION AND MAINTENANCE

(1) The Owner shall exercise due diligence in ensuring that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate operator staffing and training, including training in all procedures and other requirements of this Approval and the Act and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.

(2) The Owner shall prepare an operations manual within **six (6) months** of Substantial Completion of the Works, that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the Works;

(b) inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the Works;

(d) procedures for the inspection and calibration of monitoring equipment;

(e) a spill prevention control and countermeasures plan, consisting of contingency plans and

procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the Water Supervisor; and

(f) procedures for receiving, responding and recording public complaints, including recording any follow-up actions taken.

(3) The Owner shall maintain the operations manual current and retain a copy at the location of the Works for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

(4) The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

7. MONITORING AND RECORDING

The Owner shall, upon the issuance of this Approval, carry out the following monitoring program:

(1) All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analysed for each parameter listed and all results recorded:

Table 1 - Monitoring during a Sewage Pumping Station Overflow Event
(Samples to be collected from the Sewage Pumping Station Overflow stream near the Sewage Pumping Station)

Sample Type	Grab
Parameters	BOD5, Total Suspended Solids, Total Phosphorus, E. Coli

(3) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.

8. REPORTING

(1) **Fifteen (15) days** prior to the date of a planned Sewage Pumping Station Overflow being conducted pursuant to Condition 5 and as soon as possible for an unplanned Sewage Pumping Station Overflow, the Owner shall notify the Water Supervisor in writing of the pending start date, in addition to an assessment of the potential adverse effects on the environment and the duration of the Sewage Pumping Station Overflow.

(2) In addition to the obligations under Part X of the Environmental Protection Act, (which includes contacting the Spills Action Centre (SAC) at 1-800-268-6060 or e-mail at moe.sac.moe@ontario.ca), the Owner shall, within **ten (10) working days** of the occurrence of any reportable spill as defined in Ontario Regulation 675/98, Bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, (with the exception of a sanitary sewage discharged during an Event), submit a full written report of the occurrence to the Water Supervisor describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(3) The Owner shall prepare and submit a report to the Water Supervisor on an annual basis. The reports shall contain the following information:

(a) a copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule A, Section 1 (Limited Operational Flexibility) with a status report on the implementation of each modification;

(b) a report summarizing all modifications completed as a result of Schedule A, Section 3.

9. LIMITED OPERATIONAL FLEXIBILITY

(1) The Owner may make modifications to the Works in accordance with the Terms and Conditions of this Approval and subject to the Ministry's "Limited Operational Flexibility Criteria for Modifications to Sewage Works", included under Schedule A of this Approval, as amended.

(2) Sewage works proposed under Limited Operational Flexibility shall adhere to the design guidelines contained within the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended.

(3) The Owner shall ensure at all times, that the Works, related equipment and appurtenances which are installed or used to achieve compliance are operated in accordance with all Terms and Conditions of this Approval.

(4) For greater certainty, the following are not permitted as part of Limited Operational Flexibility:

(a) Modifications to the Works that result in an increase of the Rated Capacity of the Works;

(b) Modifications to the Works that may adversely affect the approved effluent quality criteria or the location of the discharge/outfall;

(c) Modifications to the Works approved under s.9 of the EPA, and

(d) Modifications to the Works pursuant to an order issued by the Ministry.

(5) Implementation of Limited Operational Flexibility is not intended to be used for piecemeal measures that result in major alterations or expansions.

(6) If the implementation of Limited Operational Flexibility requires changes to be made to the Emergency Response, Spill Reporting and Contingency Plan, the Owner shall, as deemed necessary in consultation with the Water Supervisor, provide a revised copy of this plan for approval to the local fire services authority prior to implementing Limited Operational Flexibility.

(7) For greater certainty, any alteration made under the Limited Operational Flexibility may only be carried out after other legal obligations have been complied with including those arising from the Environmental Protection Act, Niagara Escarpment Planning and Development Act, Oak Ridges Moraine Conservation Act, Lake Simcoe Protection Act and Greenbelt Act.

(8) Prior to implementing Limited Operational Flexibility, the Owner shall complete a Notice of Modifications describing any proposed modifications to the Works and submit it to the Water Supervisor.

10. TEMPORARY EROSION AND SEDIMENT CONTROL

(1) The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every **two (2) weeks** and after each significant storm event (a significant storm event is defined as a minimum of 25 mm of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

(2) The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

11. RECORD KEEPING

(1) The Owner shall retain for a minimum of **five (5) years** from the date of their creation, all records and information related to or resulting from the operation and maintenance activities required by this Approval.

SCHEDULE 'A'

Limited Operational Flexibility Criteria for Modifications to Sewage Works

1. The modifications to sewage works approved under an Environmental Compliance Approval (Approval) that are permitted under the Limited Operational Flexibility (LOF), are outlined below and are subject to the LOF conditions in the Approval, and require the submission of the Notice of Modifications. If there is a conflict between the sewage works listed below and the Terms and Conditions in the Approval, the Terms and Conditions in the Approval shall take precedence.

1.1 Sewage Pumping Stations

a. Adding or replacing equipment where new equipment is located within an existing sewage pumping station site, provided that the facility Rated Capacity is not exceeded and the existing flow process and/or treatment train are maintained, as applicable.

1.2 Pilot Systems

a. Installation of pilot systems for new or existing technologies provided that:
   i. any effluent from the pilot system is discharged to the inlet of the sewage pumping station or hauled off-site for proper disposal,
   ii. any effluent from the pilot system discharged to the inlet of the sewage pumping station or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
   iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and Water Supervisor three months after completion of the pilot project.

2. Sewage works that are exempt from section 53 of the OWRA by O. Reg. 525/98 continue to be exempt and are not required to follow the notification process under this Limited Operational Flexibility.

3. Normal or emergency operational modifications, such as repairs, reconstructions, or other improvements that are part of maintenance activities, including cleaning, renovations to existing approved sewage works equipment, provided that the modification is made with Equivalent Equipment, are considered pre-approved.

4. The modifications noted in section (3) above are not required to follow the notification protocols under Limited Operational Flexibility, provided that the number of pieces and description of the equipment as described in the Approval does not change.

Ontario
Ministry of
the Environment

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL) OR DISTRICT MANAGER (FOR NON-MUNICIPAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number, issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)

ECA Owner	Municipality

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Description shall include:

1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:

1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Conforms with the Limited Operational Flexibility as per the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act, and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate.

Name (Print)	PEO License Number

Signature	Date (mm/dd/yy)

Name of Employer

Part 4 – Declaration by Owner

I hereby declare that:
1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. These modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.
I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate.

Name of Owner Representative (Print)	Owner representative's title (Print)
Owner Representative's Signature	Date (mm/dd/yy)

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this Approval the existence of this Approval.

2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.

3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

4. Condition 4 is included to ensure that the Works are constructed in accordance with the Approval and that record drawings of the Works "as constructed" are maintained for future references.

5. Conditions 5 and 7 are included to indicate that Sewage Pumping Station Overflow of untreated and/or partially treated sewage to the environment is prohibited, save in certain limited circumstances where the failure to do so could result in greater injury to the public interest than the Sewage Pumping Station Overflow itself, or where the Sewage Pumping Station Overflow can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the *Owner* is aware of the extent and frequency of Sewage Pumping Station Overflow Event(s).

6. Condition 6 is included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner and made available to the Ministry. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the Works.

7. Condition 8 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

8. Condition 9 is included to ensure that the Works are operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider. These conditions are also included to ensure that a Professional Engineer has reviewed

the proposed Modifications and attests that the Modifications are in line with that of Limited Operational Flexibility, and provide assurance that the proposed Modifications comply with the Ministry's requirements stipulated in the terms and conditions of this Approval, Ministry policies, guidelines, and industry engineering standards and best management practices.

9. Condition 10 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction, until they are no longer required.

10. Condition 11 is included to require that all records are retained for a sufficient time period to adequately evaluate the long-term operation and maintenance of the Works.

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 6338-6EVJJ8 issued on August 3, 2005

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 12th day of April, 2016

Gregory Zimmer, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

MS/

c: District Manager, MOECC Ottawa office
Water Supervisor, MOECC Ottawa Office
Jennifer Ailey, David Schaeffer Engineering Ltd.
Charles Warnock, City of Ottawa
Linda Carkner, Program Manager, City of Ottawa, Infrastructure Services

Content Copy Of Original

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 0606-AHXJCH
Issue Date: February 2, 2017

Minto Communities Inc.
180 Kent Street, Suite 200
Ottawa, Ontario
K1P 0B6

Site Location: Avalon West, Stage 5
3100 Brian Coburn Boulevard
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act , R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

storm and sanitary sewers to be constructed in the City of Ottawa, as follows;

storm sewers on Decoeur Drive (from Station 14+443 to Station +15+056.5), Park Number 2 (from MH 142 to MH 5566), Future School Number 3 (from MH 134 to MH 5561), Hepatica Way (from Station 16+466 to Station 16+541.5 and from Station 16+545.5 to Station +16+773.5), Hyssop Street (from Station 18+516.5 to Station 18+730.5), Mountain Sorrel Way (from Station 20+091.5 to Station 20+380, from Station 20+391.5 to Station 20+571.5, and from Station 20+626 to Station 20+756.5), June Grass Street (from Station 12+089.5 to Station 21+307.5), Vendome Street (from Station 26+092.5 to Station 26+220.5), Maskinonge Crescent (from Station 27+088 to Station 27+242.5 and from Station 27+250.5 to Station 27+453), L'Esturgeon Street (from Station 30+047.5 to Station 30+510), Walkway Easement (from MH 5590 to MH W-FS), and Malachigan Crescent (from Station 31+092.5 to Station 31+372.5); and

sanitary sewers on Jerome Jodoin Drive (from Station 1+299.5 to Station 1+490), Decoeur Drive (from Station 14+441.5 to Station 15+056.5), Park Number 2 (from MH 42 to MH 5052), Future School Number 2 (from Stub 22 to MH 5030), Hepatica Way (from Station 16+468.5 to Station 16+772), Hyssop Street (from Station 18+518 to Station 18+729), Mountain Sorrel Way (from Station 20+089 to Station 20+573 and from Station 20+625 to Station 20+755), June Grass Street (from Station 21+091 to Station 21+306), Vendome Street (from Station 26+091 to Station 26+219), Maskinonge Crescent (from Station 27+091 to Station 27+450), L'Esturgeon Street (from Station 30+046 to Station 30+507.5), and Malachigan Crescent (from Station 31+091 to Station 31+374;

all in accordance with the application from Minto Communities Inc., dated January 11, 2017, including final plans and specifications prepared by Atrel Engineering Ltd., Consulting Engineers.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

1. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;

2. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The environmental compliance approval number;
6. The date of the environmental compliance approval;
7. The name of the Director, and;
8. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary* Environmental Review Tribunal 655 Bay Street, Suite 1500 Toronto, Ontario M5G 1E5	AND	The Director appointed for the purposes of Part II.1 of the Environmental Protection Act Ministry of the Environment and Climate Change 135 St. Clair Avenue West, 1st Floor Toronto, Ontario M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 2nd day of February, 2017

Gregory Zimmer, P.Eng.
Director
appointed for the purposes of Part II.1 of
the *Environmental Protection Act*

DG/
c: District Manager, MOECC Ottawa
Jeff McEwen, Manager, City of Ottawa (File No. D07-16-09-0018)
Linda Carkner, City of Ottawa, Program Manager, Infrastrucure Services
M. Rick O'Connor, City Clerk, City of Ottawa
Andre Sauve, P.Eng., Atrel Engineering Ltd.

Content Copy Of Original

ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 8605-AYUHJG
Issue Date: May 30, 2018

Minto Communities Inc.
180 Kent Street, Suite 200
Ottawa, Ontario
K1P 0B6

Site Location: Avalon Encore – Stage 6
2336 Tenth Line Road
City of Ottawa, Ontario

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

the establishment of wastewater infrastructure Works located in the City of Ottawa, consisting of the following:

storm sewers on Décoeur Drive (from Station 14+084 to Station 14+443), Gardenpost Terrace (from Station 29+418 to Station 29+715), Guppy Grove (Station 33+095 to Station 33+231), Sculpin Street (from Station 37+085 to Station 37+222), Damselfish Walk (from Station 32+099.5 to Station 32+321.5), Aquarium Avenue (from Station 33+243 to Station 34+251), Stickleback Way (from Station 36+089.5 to Station 36+371), Shiner Lane (from Station 35+094 to Station 35+166), Commercial lot 2575 Mer Bleue storm services off Aquarium Avenue, the proposed park and Future Site Plan services off Gardenpost Terrace, discharging to existing municipal sewage system, located on Jerome Jodoin Drive; and

sanitary sewers on Décoeur Drive (from Station 14+089 to Station 14+441), Gardenpost Terrace (from Station 29+420.5 to Station 30+012.5), Guppy Grove (from Station 33+091 to Station 33+248), Sculpin Street (from Station 33+088 to Station 37+220), Damselfish Walk (from Station 32+101 to Station 32+319), Aquarium Avenue (from Station 33+248 to Station 34+243.5), Shiner Lane (from Station 35+091.5 to Station 33+170.5), Jerome Jodoin Drive (from Station 1+854 to Station 1+490), Commercial lot 2575 Mer Bleue sanitary service off Aquarium Avenue, the proposed park, the Future Site Plan services off Gardenpost Terrace and Future School services, discharging to existing sanitary sewers, located on Décoeur Drive; and

ditches on Mer Bleue Road (from Station 8+450 to Station 8+635 (West) and

from Station 9+490 to Station 8+620 (East)) to be re-directed towards the proposed deep inlet catch basin 6 and 7, deep inlet catch basin 4 to be constructed on Mer Bleue Road (Station 8+422 (East)) to drain existing ditch along Mer Bleue Road (from Station 8+371 to Station 8+422 (East)), discharging to the existing municipal sewage system, located on Jerome Jodoin Drive;

including erosion/sedimentation control measures during construction and all other controls and appurtenances essential for the proper operation of the aforementioned Works;

all in accordance with the submitted application and supporting documents listed in Schedule "A" forming part of this Approval.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "*Approval*" means this entire document and any schedules attached to it, and the application;
2. "*Director*" means a person appointed by the Minister pursuant to section 5 of the *EPA* for the purposes of Part II.1 of the *EPA*;
3. "*District Manager*" means the District Manager of the appropriate local District Office of the Ministry, where the *Works* are geographically located;
4. "*EPA*" means the *Environmental Protection Act, R.S.O. 1990, c.E.19* , as amended;
5. "*Ministry*" means the ministry of the government of Ontario responsible for the *EPA* and *OWRA* and includes all officials, employees or other persons acting on its behalf;
6. "*Owner*" means Minto Communities Inc., and includes its successors and assignees;
7. "*OWRA*" means the *Ontario Water Resources Act, R.S.O. 1990, c. O.40*, as amended;
8. "*Works*" means the sewage Works described in the *Owner*'s application, and this *Approval*.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL CONDITIONS

1. The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Works* is notified of this *Approval* and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
2. Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Approval*, and the application for approval of the *Works*.
3. Where there is a conflict between a provision of any document in the schedule referred to in this *Approval* and the conditions of this *Approval*, the conditions in this *Approval* shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.
4. Where there is a conflict between the documents listed in Schedule "A" and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
5. The conditions of this *Approval* are severable. If any condition of this *Approval*, or the application of any requirement of this *Approval* to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this *Approval* shall not be affected thereby.

2. EXPIRY OF APPROVAL

1. This *Approval* will cease to apply to those parts of the Works which have not been constructed within five (5) years of the date of this *Approval*.
2. In the event that completion and commissioning of any portion of the *Works* is anticipated to be delayed beyond the specified expiry period, the *Owner* shall submit an application of extension to the expiry period, at least twelve (12) months prior to the end of the period. The application for extension shall include the reason(s) for the delay, whether there is any design change(s) and a review of whether the standards applicable at the time of *Approval* of the *Works* are still applicable at the time of request for extension, to ensure the ongoing protection of the environment.

3. CHANGE OF OWNER

1. The *Owner* shall notify the *District Manager* and the *Director*, in writing, of any of the following changes within thirty (30) days of the change occurring:

    a. change of *Owner*;

    b. change of address of the *Owner*;

    c. change of partners where the *Owner* is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act* , R.S.O. 1990, c.B17 shall be included in the notification to the *District Manager*; or

    d. change of name of the corporation where the *Owner* is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act*, R.S.O. 1990, c. C39 shall be included in the notification to the *District Manager*.

2. In the event of any change in ownership of the *Works*, other than a change to a successor municipality, the *Owner* shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the *District Manager* and the Director.
3. The *Owner* shall ensure that all communications made pursuant to this condition refer to the number at the top of this Approval.

4. OPERATION AND MAINTENANCE

1. If applicable, any proposed storm sewers or other stormwater conveyance in this Approval can be constructed but not operated until the proposed stormwater management facilities in this Approval or any other Approval that are designed to service the storm sewers or other stormwater conveyance are in operation.

Schedule "A"

1. Application for Environmental Compliance Approval, dated April 25, 2018, received on May 03, 2018, submitted by Minto Communities Inc.;
2. Transfer of Review Letter of Recommendation, dated April 30, 2018, and signed by Josh White, P.Eng., Senior Engineer - Infrastructure Applications, City of Ottawa.
3.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted. This condition is also included to emphasize the precedence of conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.
2.
3. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.
4.
5. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.
6.
7. Condition 4 is included to prevent the operation of stormwater pipes and other conveyance until such time that their required associated stormwater management Works are also constructed.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

a. The portions of the environmental compliance approval or each term or condition in the

environmental compliance approval in respect of which the hearing is required, and;

b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

AND

The Director appointed for the purposes of Part II.1 of the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or** www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 30th day of May, 2018

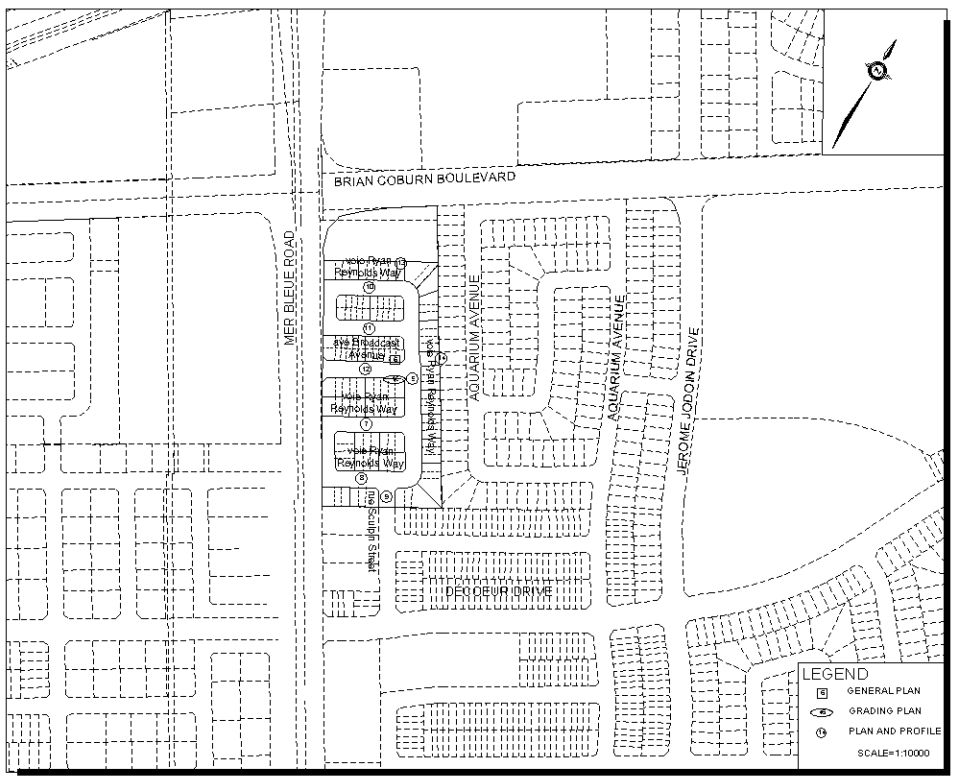
Christina Labarge, P.Eng.
Director
appointed for the purposes of Part II.1 of the *Environmental Protection Act*

EV/
c: District Manager, MOECC Ottawa
Clerk, City of Ottawa (File No. D07-16-09-0018)
Linda Carkner, Program Manager, City of Ottawa
Domenic Idone, Director, Minto Communities
Josh White, P.Eng., Senior Engineer - Infrastructure Applications, City of Ottawa

Will Curry, C.E.T., City of Ottawa
Andre Sauve, Atrel Engineering Ltd.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

Sheet List Table		
Sheet Number	Sheet Title	Sheet Description
0	TITLE PAGE	
1	GENERAL NOTES	
2	STANDARD ROADWAY CROSS SECTIONS	
3	DETAILS AND TABLE	
4	DETAILS	
5	TWSI DETAILS	
6	GENERAL PLAN	
7	voie Ryan Reynolds Way	STA. 0+0.000 TO STA. 0+90.000
8	voie Ryan Reynolds Way	STA. 0+90.000 TO STA. 0+250.000
9	voie Ryan Reynolds Way	STA. 0+250.000 TO STA. 0+410.000
10	voie Ryan Reynolds Way	STA. 0+410.000 TO STA. 0+530.000
11	voie Ryan Reynolds Way	STA. 0+530.000 TO STA. 0+649.000
12	ave Broadcast Avenue	STA 0+0.000 TO STA. 0+134.837
13	Block 27 (MEDIUM DENSITY AND MIXED USE)	STA. 0+0.000 TO STA. 0+39.294
14	Block 28 (SERVICING AND WALKWAY)	STA. 0+0.000 TO STA. 0+77.708
15	rue Sculpin Street	STA. 0+0.000 TO STA. 0+78.515
16	GRADING PLAN	
17	CROSS SECTIONS	
18	SANITARY DRAINAGE PLAN	
19	STORM DRAINAGE PLAN	
20	STATIC PONDING & 100 YEAR + 20% PONDING PLAN	
21	EROSION AND SEDIMENT CONTROL PLAN STAGE 1	
22	EROSION AND SEDIMENT CONTROL PLAN STAGE 2	



DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

PROJECT No. 20-1214

CITY OF OTTAWA

CAIVAN (MER BLEUE) INC.

CITY FILE No. D07-16-21-0001 CITY PLAN No. 18616

000497

GENERAL NOTES:

1. ALL WORKS AND MATERIALS SHALL CONFORM TO THE LATEST REVISIONS OF THE STANDARDS AND SPECIFICATIONS OF THE CITY OF OTTAWA, AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), AS AMENDED BY THE CITY OF OTTAWA.
2. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION, TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
3. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE ENGINEER.
4. ANY AREAS BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTOR'S EXPENSE.
5. RELOCATION OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER AT THE EXPENSE OF THE DEVELOPER.
6. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS". THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONSTRUCTOR AS DEFINED IN THE ACT.
7. ALL CONSTRUCTION SIGNING MUST CONFORM TO THE M.T.O. MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (LATEST AMENDMENT).
8. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE SPECIFIED.
9. THE SUPPORT OF ALL UTILITIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
10. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL BY THE DIRECTOR OF ENGINEERING HAS BEEN OBTAINED.
11. ALL SEWERS CONSTRUCTED WITH GRADES 0.50% OR LESS, SHALL BE INSTALLED WITH LASER AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
12. THE CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL BEDDING OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH, AS SPECIFIED BY OPSD, IS EXCEEDED.
13. ALL PIPE / CULVERT / SECTION SIZES REFER TO INSIDE DIMENSIONS.
14. SHOULD DEEPLY BURIED ARCHAEOLOGICAL REMAINS BE FOUND ON THE PROPERTY DURING CONSTRUCTION ACTIVITIES, THE HERITAGE OPERATIONS UNIT OF THE ONTARIO MINISTRY OF CULTURE MUST BE NOTIFIED IMMEDIATELY.
15. STREET LIGHTING TO CITY OF OTTAWA STANDARDS.
16. ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING.
17. CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 410 AND OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL STORM AND SANITARY SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW.
18. THE CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING NO. S8. THE SEALS SHOULD EXTEND FROM BOTTOM OF TRENCH EXCAVATION TO UNDERSIDE OF ROAD STRUCTURE. THE SEALS SHOULD BE AT LEAST 1.5m LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. GENERALLY, THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUBBEDDING AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPACTABLE BROWN SILTY CLAY PLACED IN MAXIMUM 225mm THICK LOOSE LAYERS COMPACTED TO A MINIMUM OF 95% OF THE MATERIAL'S SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT STRATEGIC LOCATIONS AT NO MORE THAN 60m INTERVALS IN THE SERVICE TRENCHES.
19. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT PREPARED BY PG5083-1-REVISION-2 DATED MARCH 12, 2020, PREPARED BY PATERSON GROUP INC.
20. SLEEVES SHALL BE USED FOR HOUSE CONNECTIONS INSTALLED UNDER GARAGES. HOUSE CONNECTIONS UNDER GARAGES ARE ON AN EXCEPTION BASIS ONLY. SEE DWG. 3 FOR DETAILS.
21. SANITARY AND STORM CONNECTIONS SHALL FOLLOW CITY STANDARDS S11 AND S11.1. WATER CONNECTION SHALL FOLLOW CITY STANDARD W26.

STORM NOTES:

1. ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2 (LATEST AMENDMENT). ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1 (LATEST AMENDMENT). PIPE SHALL BE JOINTED WITH STD. RUBBER GASKETS AS PER CSA A257.3 (LATEST AMENDMENT).
2. ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. S6 AND S7 CLASS 'B' UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
3. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
4. ALL STORM LATERALS SHALL BE PVC SDR 28, WHITE IN COLOR AND MARKED WITH A 50mm x 100mm WOODEN MARKER EXTENDING FROM THE INVERT TO 1.0m ABOVE GRADE PAINTED GREEN. HOUSE CONNECTIONS SHALL BE 2.0 m MIN. BELOW FINISHED GRADE AT STREET LINE WHERE POSSIBLE. SINGLE CONNECTIONS SHALL BE 100mm DIA.
5. STORM MANHOLE FRAME AND COVERS SHALL BE AS PER CITY OF OTTAWA STD. S24.1 AND S25. ALL START OF RUNS MH COVERS THAT ARE NOT IN PONDING AREAS ARE TO BE S28.1.
6. SAFETY PLATFORMS SHALL BE IN ACCORDANCE WITH OPSD 404.02.
7. STORM SEWER MANHOLES SERVING LOCAL SEWERS LESS THAN 900mm SHALL BE CONSTRUCTED WITH A 300mm SUMP. FOR STORM SEWERS 900mm AND OVER USE BENCHING IN ACCORDANCE WITH OPSD 701.021.
8. SINGLE AND DOUBLE CATCHBASINS SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. S1 AND OPSD 705.020, RESPECTIVELY. FRAMES AND GRATE SHALL BE AS PER CITY OF OTTAWA STD. S19.1 FOR REAR LOT CATCHBASINS AND STREET CATCHBASINS. COVER FRAMES LOCATED OUTSIDE OF THE TRAVELED PORTION OF THE ROADWAY OR THE SIDEWALK SHALL BE ANCHORED DIRECTLY TO THE TOPS OF THE PRECAST CONCRETE TOP/CAP WITH A MINIMUM OF FOUR WEDGE ANCHORS EQUALLY SPACED AROUND THE FRAME AS PER CITY SPECIFICATION F-4070. WEDGE ANCHORS SHALL MEET THE REQUIREMENTS OF MS-14.1
9. CURB INLET TYPE CATCH BASIN (CICB) SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. S3. FRAME AND GRATE SHALL BE AS PER CITY OF OTTAWA STD. S22 AND S23, UNLESS OTHERWISE NOTED.
10. SINGLE AND DOUBLE CATCHBASIN LEADS SHALL BE 200mm UNLESS OTHERWISE SPECIFIED, AT 1.0% SLOPE (MIN.). CB LEAD OUT INVERT TO BE SET 1.38m BELOW TOP OF GRATE ELEVATION UNLESS OTHERWISE NOTED.
11. ALL STREET CATCHBASINS/CATCHBASIN MANHOLES SHALL HAVE 600mm SUMPS, AND ALL REAR YARD CATCHBASINS (OPSD 705.010) SHALL HAVE 300mm SUMPS UNLESS OTHERWISE NOTED. REAR YARD LANDSCAPE CATCHBASINS TO BE SUMPLESS.
12. CONTRACTOR SHALL ENSURE THAT CATCHBASINS ARE INSTALLED AT THE LOW POINT OF SAG CURB WORKS.
13. THE STORM SEWER CLASSES HAVE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE ADDITIONAL BEDDING, A DIFFERENT TYPE OF BEDDING OR A HIGHER PIPE STRENGTH AT HIS OWN EXPENSE AND SHALL ALSO BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
14. THE MINIMUM DIAMETER FOR REAR LOT PERFORATED PIPE IS 250mm. REFER TO CITY STD. S29 FOR DETAIL, UNLESS OTHERWISE NOTED.
15. FOR TWO OR MORE REAR LOT CATCH BASINS CONNECTED IN SERIES, THE LEAD FROM THE LAST REAR LOT CB TO THE STORM SEWER SHALL BE SOLID PIPE.

SANITARY NOTES:

1. ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS) AS AMENDED BY THE CITY OF OTTAWA.
2. ALL SANITARY SEWERS SHALL BE PVC SDR 35, IPEX "RING-TITE" (OR EQUIVALENT), AS PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE NOTED.
3. SANITARY SEWER TRENCH AND BEDDING SHALL BE AS PER CITY OF OTTAWA STD. S6 AND S7, CLASS "B" BEDDING UNLESS OTHERWISE NOTED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
4. ALL SANITARY LATERALS ARE TO BE PVC SDR 28, IPEX "RING-TITE" (OR EQUIVALENT) AND MARKED WITH A 50mm x 100mm WOODEN MARKER, EXTENDING FROM THE INVERT TO 1.0 m ABOVE GRADE. HOUSE CONNECTIONS SHALL BE 2.50m BELOW FINISHED GRADE AT STREET LINE WHERE POSSIBLE. SINGLE CONNECTIONS SHALL BE 135mm DIA.
5. SANITARY MANHOLE FRAME AND COVERS SHALL BE AS PER CITY OF OTTAWA STD. S24 AND S25.
6. SAFETY PLATFORMS SHALL BE AS PER OPSD 404.02.
7. DROP STRUCTURES SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA SPECIFICATIONS AND OPSD 1003.01.
8. SANITARY SEWER MANHOLES SHALL BE BENCHED AS PER OPSD 701.021
9. COVER FRAMES LOCATED OUTSIDE OF THE TRAVELED PORTION OF THE ROADWAY OR THE SIDEWALK SHALL BE ANCHORED DIRECTLY TO THE TOPS OF THE PRECAST CONCRETE TOP/CAP WITH A MINIMUM OF FOUR WEDGE ANCHORS EQUALLY SPACED AROUND THE FRAME AS PER CITY SPECIFICATION F-4070. WEDGE ANCHORS SHALL MEET THE REQUIREMENTS OF MS-14.1

WATER NOTES:

1. ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS) AS AMENDED BY THE CITY OF OTTAWA.
2. ALL PVC WATERMAINS SHALL BE EQUAL TO AWWA C-900 CLASS 150, SDR 18.
3. WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
4. ALL PVC WATERMAINS SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W36
5. WATER SERVICES ARE TO BE TYPE K SOFT COPPER AS PER CITY OF OTTAWA STD. W26 UNLESS OTHERWISE SPECIFIED. SINGLE SERVICES SHALL BE 19mm DIA., 50mm DIA. COPPER SHALL BE USED FOR PARK SERVICES. WATER SERVICES SHALL BE MARKED WITH A "50mm x 100mm", EXTENDING FROM THE INVERT TO 1.0m ABOVE GRADE PAINTED BLUE. CURB STOPS SHALL BE INSTALLED AT THE PROPERTY LINE.
6. CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS AS PER CITY OF OTTAWA STD. W40 AND W42.
7. CONTRACTOR TO SUPPLY HYDRANT EXTENSION TO ADJUST THE LENGTH OF HYDRANT BARREL AS REQUIRED TO ENSURE FLANGE IS ABOVE FINISHED GRADE PER CITY STD W19.
8. FIRE HYDRANTS SHALL BE INSTALLED AS PER CITY OF OTTAWA STD. W19, AND LOCATED AS PER CITY STD. W18
9. VALVE IN BOXES SHALL BE INSTALLED AS PER CITY OF OTTAWA STD. W24
10. 50mm DIAMETER WATERMAINS SHALL BE TYPE 'K' COPPER TUBING. WATERMAIN INSTALLATION IN CUL-DE-SAC TO BE INSTALLED AS PER CITY OF OTTAWA STD W37
11. WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS AS PER CITY OF OTTAWA STD. W25.5 AND W25.6.
12. THRUST BLOCKING OF WATERMAIN TO BE INSTALLED AS PER CITY OF OTTAWA STD. W25.3 AND W25.4
13. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS AND BLOW-OFFS AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
14. INSULATION FOR WATERMAIN CROSSING OVER AND BELOW SEWER SHOULD BE IN ACCORDANCE WITH CITY OF OTTAWA STD. W25.2 AND W25, RESPECTIVELY, WHERE WATERMAIN COVER IS LESS THAN 2.4m.
15. WHERE THE SEPARATION BETWEEN SERVICES AND MANHOLES IS LESS THAN 1.2m, WATER SERVICES ARE TO BE INSULATED AS PER CITY STD. W23.
16. AS PER MECP GUIDELINES WHEN CROSSING BELOW, THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER / UTILITY IS 0.50m. FOR CROSSING UNDER SEWER, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTRED AT THE POINT OF CROSSING SO THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.

ROADWORK NOTES:

1. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
2. CONCRETE CURB SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. SC1.1 (BARRIER CURB) AND SC1.3 (MOUNTABLE CURB). PROVISION SHALL BE MADE FOR CURB DEPRESSIONS AT SIDEWALKS AND DRIVEWAYS.
3. ROAD SUBDRAINS SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. R1.
4. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. SC3 AND SC1.4
5. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD. R10 AND OPSD 509.01, OPSS 310.
6. GRANULAR "A" SHALL BE PLACED TO A MINIMUM THICKNESS OF 300mm AROUND ALL STRUCTURES WITHIN PAVEMENT AREA.
7. ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO A MINIMUM OF 98% STANDARD PROCTOR DENSITY.
8. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS & NECESSARY REPAIRS HAVE BEEN CARRIED OUT TO THE SATISFACTION OF THE CONSULTANT.
9. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300mm LIFTS.
10. PEDESTRIAN CURB RAMP WITH BOULEVARD SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD.SC7
11. PAVEMENT DESIGN TYPE

<u>LOCAL ROADS</u> (vale Ryan Reynolds Way, ave Broadcast Avenue, rue Sculpin Street)
- 40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
- 50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
- 150mm OPSS GRANULAR A CRUSHED STONE
- 400mm OPSS GRANULAR B TYPE II

<u>RESIDENTIAL DRIVEWAYS</u> (vale Ryan Reynolds Way, ave Broadcast Avenue)
- 50mm HL-3 OR SUPERPAVE 12.5 ASPHALTIC CONCRETE
- 150mm OPSS GRANULAR A CRUSHED STONE
- 300mm OPSS GRANULAR B TYPE II

GRADING NOTES:

1. A FLAT AREA HAVING A WIDTH OF 0.6m SHALL BE PROVIDED AT THE BOUNDARY LIMITS ADJACENT DEVELOPED PROPERTIES IN ORDER THAT THE EXISTING BOUNDARY ELEVATIONS SHALL BE MAINTAINED.
2. ALL ROOF DOWNSPOUTS SHALL DISCHARGE TO THE GROUND ONTO SPLASH PADS AND SHALL NOT BE CONNECTED TO THE STORM SEWER, OR THE BUILDING FOUNDATION DRAIN.
3. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS." THE GENERAL CONTRACTOR SHALL BE DESIGNATED AS THE CONSTRUCTOR AS DEFINED IN THE ACT.
4. PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL. THE CONTRACTOR SHALL MAINTAIN ALL WORKS UNTIL SERVICING CONSTRUCTION IS COMPLETED TO THE SATISFACTION OF THE ENGINEER AND THE CITY OF OTTAWA.
5. ALL SWALES SHALL BE 0.15m DEEP WITH 3:1 SIDE SLOPES UNLESS OTHERWISE INDICATED. THE MINIMUM LONGITUDINAL SLOPE IS 0.5% AND 1.5% WITH INSTALLATION OF SUBDRAIN OR WITHOUT, RESPECTIVELY.
6. TOP OF GRATE (T/G) ELEVATIONS FOR ALL STREET CATCHBASINS SHOWN ON PLANS, REFER TO THE ELEVATIONS AT GUTTER OR EDGE OF PAVEMENT, WHERE APPLICABLE.

EROSION AND SEDIMENT CONTROL NOTES:

1. PRIOR TO TOPSOIL STRIPPING, EARTHWORKS, OR UNDERGROUND CONSTRUCTION, EROSION AND SEDIMENT CONTROLS SHALL BE IMPLEMENTED TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
2. SEDIMENT CONTROL FENCE SHALL BE CLEANED AND MAINTAINED IN GOOD REPAIR BY CONTRACTOR.
3. SEDIMENT CONTROL FENCE TO REMAIN IN PLACE UNTIL THE WORKING AREA HAS BEEN STABILIZED AND REVEGETATED.
4. ACCUMULATED SEDIMENT TO BE REMOVED OFF SITE PRIOR TO THE REMOVAL OF SEDIMENT CONTROL FENCE.
5. CONTRACTOR TO INSTALL AND MAINTAIN MUD MAT AT CONSTRUCTION ACCESS IN ORDER TO PREVENT MUD TRACKING ONTO ADJACENT ROADS. MUD MAT TO BE MINIMUM 30m LONG AND 10.0m WIDE AND SHALL CONSIST OF 0.3m OF 50mm CLEAR STONE.

SPILLS CONTROL NOTES:

1. ALL CONSTRUCTION EQUIPMENT SHALL BE REFUELED, MAINTAINED AND STORED NO LESS THAN 30 METERS FROM THE WATERCOURSES, STREAMS, CREEKS, WOODLOTS AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
2. THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
3. IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF A POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:

a) IMMEDIATELY NOTIFY THE APPROPRIATE FEDERAL, PROVINCIAL AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, ETC.
b) TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES AS THEY DEEM APPROPRIATE TO MITIGATE AGAINST THE ANY ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
c) THE CONTRACT SHALL RESTORE THE AFFECTED AREA TO ORIGINAL CONDITION OR BETTER, ALL TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

GEOTECHNICAL REPORT/MEMO:

REFER TO:

- GEOTECHNICAL INVESTIGATION REPORT NO. PG5521-1-REVISION-1 DATED MARCH 10, 2021 BY PATERSON GROUP.

INFORMATION PRESENTED ON THESE DRAWINGS HAS BEEN INTERPOLATED FROM THE GEOTECHNICAL REPORTS AND ACCURACY IS NOT GUARANTEED. CONTRACTORS ARE ADVISED TO READ THE GEOTECHNICAL REPORTS AND ASSUME THEIR OWN CONCLUSIONS.

LEGEND

WATERMAIN

CROSS
45° BEND
LATERAL
HYDRANT, VALVE & VB
TEE
VALVE & VC
VALVE & VB
22.5° BEND
11.25° BEND
REDUCER
CAP

SANITARY

MAINTENANCE HOLE
CAP
EXISTING SANITARY MAINTENANCE HOLE

STORM

STREET CATCHBASIN & LEAD
STREET CATCHBASIN WITH CLOSED LID & LEAD
MAINTENANCE HOLE
CURB INLET CATCHBASIN & LEAD
CATCHBASIN / MAINTENANCE HOLE
INTERCONNECTED CATCH BASIN & LEADS
CAP
SINGLE SERVICE LOCATION (ST, SAN & WM)
SINGLE SERVICE LOCATION (SAN & WM)
SINGLE SERVICE LOCATION (ST, SAN & WM)
TEE CATCHBASIN
PERFORATED PIPE
ELBOW CATCHBASIN
EXISTING STORM MAINTENANCE HOLE
DITCH AND CULVERT
CONCRETE SIDEWALK
CURB & DEPRESSED CURB
ASPHALT SIDEWALK
CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
NOISE BARRIER (3.0m UNLESS OTHERWISE NOTED)
DECORATIVE FENCE (SEE LANDSCAPE DRAWINGS FOR DETAIL)
WOOD PRIVACY BARRIER
POST AND RAIL FENCE
PHASING LIMITS
PROPERTY BOUNDARY
BOREHOLE (BH), TEST PIT (TP), AUGER HOLE (AH), MONITORING WELL LOCATION, CONCEPTUAL WELL LOCATION — AS PER GEOTECHNICAL REPORT
CONTOUR
PROPOSED ELEVATION
EXISTING ELEVATION
TOP OF GRATE ELEVATION — T/G 92.55
PROPOSED TERRACING
SURFACE SLOPE — 2.0%
FLOW DIRECTION
MAJOR OVERLAND FLOW DIRECTION
TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6)

BUILDING ENVELOPE

TOP OF FOUNDATION ELEVATION
FINISHED FLOOR ELEVATION
UNDERSIDE OF FOOTING ELEVATION
NUMBER OF RISERS
UNITS REQUIRING PRESSURE REDUCING VALVES
WALKOUT UNITS
SLAB ON GRADE
SANITARY DRAINAGE BOUNDARY
UPSTREAM MH TO DOWNSTREAM MH — 43A - 44A
AREA IN HECTARES — 0.78
POPULATION — 61
STORM DRAINAGE BOUNDARY
UPSTREAM MH TO DOWNSTREAM MH — 43 - 44
AREA IN HECTARES — 0.37
RUNOFF COEFFICIENT — 0.51
PONDING AREA
PONDING AREA ID — PA-1
PROPOSED SILT FENCE
PROPOSED SNOW FENCE
PROPOSED ROCK FLOW CHECK DAM
PROPOSED STRAW BALE BARRIER
PROPOSED STRAW BALE BARRIER WITH FILTER CLOTH
FILTER CLOTH FOR EXISTING STRUCTURE
PROPOSED RIP RAP TREATMENT
JOINT UTILITY TRENCH (HYDRO, BELL, CABLE)
DENOTES NUMBER OF UTILITY DUCTS
CONCRETE ENCASED DUCT
STREET LIGHT CABLE
NATURAL GAS LINE
SERVICE ENTRANCE HYDRO, BELL, CABLE
END WALL BOX
CABLE PEDESTAL
CABLE GRADE LEVEL BOX
BELL PEDESTAL
BELL GRADE LEVEL BOX FOR SPLICING
BELL CENTRAL SPLITTING POINT
HYDRO TRANSFORMER
HYDRO MAINTENANCE HOLE
HYDRO POLE
HYDRO POLE c/w GUY WIRE
STREET LIGHT DISCONNECT
STREET LIGHT STANDARD
COMMUNITY MAILBOX — CMB
BUS STOP LOCATION c/w ASPHALT BOULEVARD — BUS
TREE

CITY OF OTTAWA					
SEWER AND WATERMAIN INSULATION					
CALCULATION OF THICKNESS OF INSULATION					
Depth (m)	Ti	Using Ti			
(m)	(mm)	(mm)	As per City Standard (W22):		
1.05	113	125		Ti=	(2400 - H)
1.10	108	125			12
1.15	104	125			
1.20	100	100			
1.25	96	100			
1.30	92	100	where	Ti =	Thickness of Insulation (mm), 50mm min.
1.35	88	100		H =	H Depth of Cover above O.D (mm)
1.40	83	100			
1.45	79	100			
1.50	75	75			
1.55	71	75			
1.60	67	75			
1.65	63	75			
1.70	58	75			
1.75	54	75			
1.80	50	50			
1.85	46	50			
1.90	42	50			
1.95	38	50			
2.00	33	50			
2.05	29	50			
2.10	25	50			
2.15	21	50			
2.20	17	50			
2.25	13	50			
2.30	8	50			

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED. PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED. PROJECT No. 18048-19 SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES. PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.28m ON THE TOP OF SPINDLE. ELEVATION = 89.280m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-08-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-08-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER s.21 22-08-29 PROVINCE OF ONTARIO

© DSEL

GENERAL NOTES

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

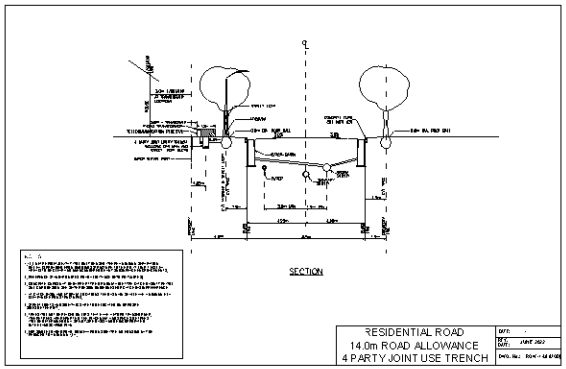
DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

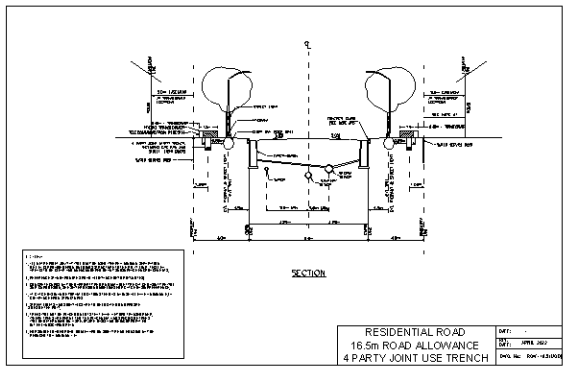
DRAWN BY: A.K./V.W.	CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: C.M.	1
SCALE:	DATE: DECEMBER 2021	

CITY FILE No. D07-16-21-0001

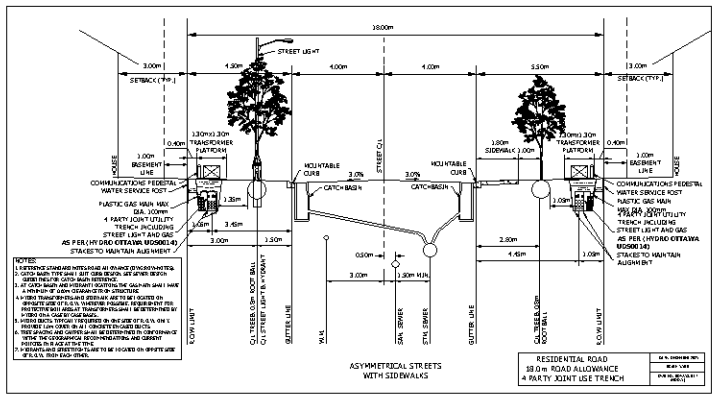
CITY PLAN No. 18616



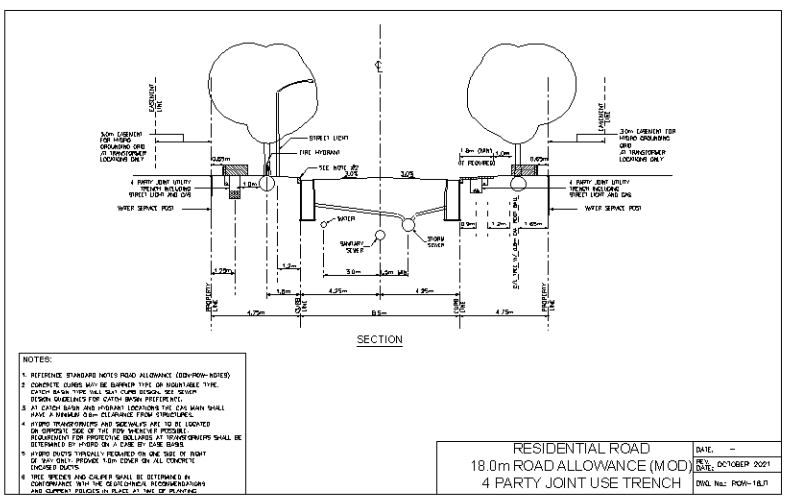
vole Ryan Reynolds Way (STA 0+089.394 TO STA 0+142.633)
vole Ryan Reynolds Way (STA 0+513.877 TO STA 0+552.089)



vole Ryan Reynolds Way (STA 0+000.000 TO STA 0+089.394)
vole Ryan Reynolds Way (STA 0+357.368 TO STA 0+513.877)
vole Ryan Reynolds Way (STA 0+552.089 TO STA 0+638.999)



ave Broadcast Avenue
vole Ryan Reynolds Way (STA 0+142.633 TO STA 0+357.368)



rue Sculpin Street

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED. PROJECT No. 20-10-178-00. SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022. TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED. PROJECT No. 18048-19. SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION
M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00. RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE
LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (ADV JOB NO. 180648-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-08-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-08-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

PROFESSIONAL ENGINEERS PROVINCE OF ONTARIO S.21 22-08-29

© DSEL

STANDARD ROADWAY CROSS SECTIONS

CAIVAN (MER BLEUE) INC.

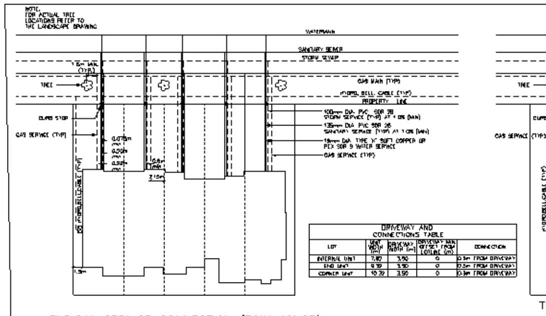
CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.dsel.ca

DRAWN BY: A.F. / V.N.	CHECKED BY: W.L.	SHEET NO
DESIGNED BY: W.L.	CHECKED BY: C.M.	2
SCALE: 1:500	DATE: DECEMBER 2021	

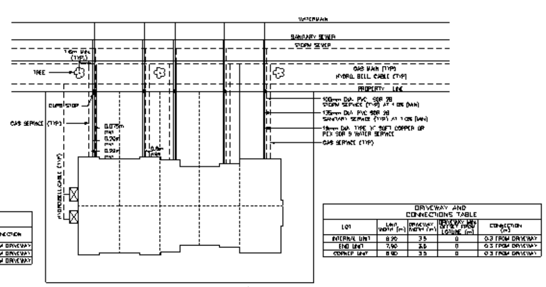
CITY FILE No. D07-16-21-0001 CITY PLAN No. 18816

000499



LOT	LOT WIDTH (m)	DRIVEWAY WIDTH (m)	DRIVEWAY MIN OFFSET FROM LOTLINE (m)	CONNECTION
INTERIOR UNIT	[illegible]	3.50	0	0.3m FROM DRIVEWAY
END UNIT	[illegible]	3.50	0	0.3m FROM DRIVEWAY
CORNER UNIT	[illegible]	3.50	0	0.3m FROM DRIVEWAY

TYPICAL SERVICE CONNECTION (TOWNHOUSE)
NTS

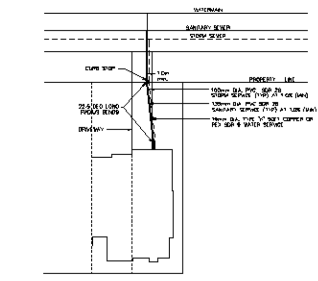


LOT	LOT WIDTH (m)	DRIVEWAY WIDTH (m)	DRIVEWAY MIN OFFSET FROM LOTLINE (m)	CONNECTION (m)
INTERIOR UNIT	[illegible]	3.5	0	0.3 FROM DRIVEWAY
END UNIT	[illegible]	3.5	0	0.3 FROM DRIVEWAY
CORNER UNIT	[illegible]	3.5	0	0.3 FROM DRIVEWAY

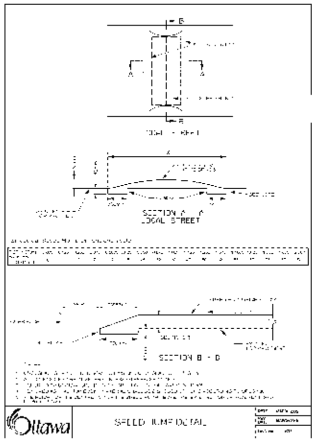
TYPICAL SERVICE CONNECTION (BACK TO BACK TOWNHOUSE SLAB ON GRADE)
N.T.S.

INLET CONTROL DEVICE (ICD) DATA (Circular Orifice Plate)

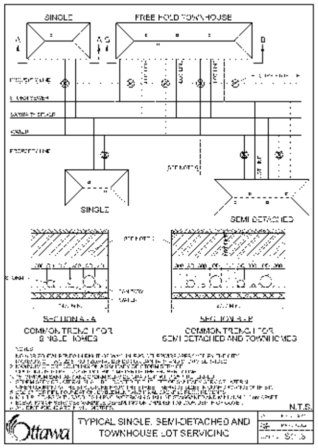
STREET NAME	CATCHBASIN ID	OUTLET PIPE DIA (mm)	OUTLET PIPE TYPE	OUTLET PIPE LENGTH (m)	INV. DEPTH (m)	TOP OF GRATE	GRATE / COVER	INVERT INLET	INVERT OUTLET	ICD DIA (mm)	PONDING ID	STATIC PONDING DEPTH (m)	RELEASE RATE AT 2 YEAR EVENT (L/S)	RELEASE RATE AT 100 YEAR EVENT (L/S)	DRAWDOWN 2 YEAR EVENT (HH:MM)	DRAWDOWN 100 YEAR EVENT (HH:MM)
[illegible] Broadcast Avenue	CB 23	200	PVC	4.93	1.36	88.22	S19 PERFORATED	-	86.91	83	PA-19	0.17	14	17	00:37	01:23
	CB 24	200	PVC	1.00	1.36	88.21	S19 PERFORATED		86.93	83	PA-20	0.13	14	17	00:37	01:23
	CB 25	200	PVC	0.37	1.35	[illegible]	S19 PERFORATED	-	86.37	127	PA-21	0.12	14	[illegible]	[illegible]	[illegible]
	CB 26	200	PVC	2.70	1.35	[illegible]	S19 PERFORATED	-	86.37	127	PA-22	0.12	14	[illegible]	[illegible]	[illegible]
[illegible] Sculpin Street	CB 1	200	PVC	2.06	1.74	87.90	S19 PERFORATED	85.21	86.16	152	NO POND	0	2	48	00:32	00:53
	CB 27	200	PVC	0.47	1.74	87.90	S19 PERFORATED	85.21	86.16	152	NO POND	0	9	33	00:32	00:53
[illegible] Ryan Reynolds Way	CB 2	200	PVC	0.89	1.35	88.23	S19 PERFORATED	-	86.85	83	PA-1	0.12	13	16	00:49	01:20
	CB 3	200	PVC	5.24	1.36	88.22	S19 PERFORATED	-	86.84	83	PA-2	0.13	13	17	00:49	01:20
	CICB 4	200	PVC	1.05	1.35	88.01	S22 & S23	-	86.66	83	PA-3	0.2	17	15	01:41	02:41
	CICB 5	200	PVC	5.25	1.35	88.01	S22 & S23	-	86.66	94	PA-4	0.2	19	24	01:41	02:41
	CB 6	200	PVC	5.01	1.36	88.07	S19 PERFORATED		86.69	127	PA-5	0.07	14	40	00:46	00:57
	CB 7	200	PVC	1.00	1.36	88.08	S19 PERFORATED		86.70	127	PA-6	0.12	14	40	00:46	00:57
	CB 8	200	PVC	5.07	1.36	88.23	S19 PERFORATED	-	86.85	102	NO POND	0	3	6	00:29	00:50
	CB 9	200	PVC	1.00	1.77	88.14	S19 PERFORATED	85.42	86.37	102	PA-8	0.16	26	28	00:44	[illegible]
	CB 10	200	PVC	5.00	1.36	88.14	S19 PERFORATED	-	86.76	94	PA-7	0.15	14	24	00:44	[illegible]
	CB 11	200	PVC	1.07	1.74	88.26	S19 PERFORATED	85.50	86.52	108	PA-10	0.11	29	31	00:42	01:10
	CB 12	200	PVC	5.00	1.36	88.25	S19 PERFORATED		86.87	83	PA-9	0.12	12	18	00:42	01:10
	CB 13	200	PVC	5.00	1.81	88.26	S19 SOLID ALTERNATE	85.50	86.45	152	NO POND	0	12	47		
	CB 14	200	PVC	5.21	1.35	88.32	S19 PERFORATED	-	86.94	83	PA-11	0.17	7	16	00:33	00:55
	CB 15	200	PVC	1.36	1.36	88.32	S19 PERFORATED	-	86.94	83	PA-12	0.17	7	16	00:33	00:55
	CB 16	200	PVC	5.33	1.74	88.25	S19 PERFORATED	85.55	86.51	83	PA-13	0.24	18	19	01:09	01:50
	CB 17	200	PVC	1.54	1.36	88.26	S19 PERFORATED	-	86.88	94	PA-14	0.23	20	24	01:09	01:50
	CB 18	200	PVC	5.25	1.84	88.37	S19 PERFORATED	85.53	86.53	94	PA-13	0.12	12	22	01:02	01:35
	CICB 19	200	PVC	11.62	1.36	88.19	S22 & S23		86.81	102	PA-15	0.28	26	26	02:16	02:44
	CICB 20	200	PVC	10.05	1.35	[illegible]	S22 & S23	-	[illegible]	94	PA-16	0.23	22	24	02:16	02:44
	CB 21	200	PVC	0.56	1.35	88.30	S19 PERFORATED	-	86.92	83	PA-17	0.11	15	16	00:54	01:26
	CB 22	200	PVC	5.25	1.36	88.28	S19 PERFORATED		86.96	83	PA-18	0.21	15	18	00:24	00:28
	CB 28	200	PVC	5.75	2.07	88.41	S19 SOLID ALTERNATE	85.39	86.34	83	NO POND	0	7	19	-	-
	CB 29	200	PVC	5.73	1.74	88.22	S19 SOLID ALTERNATE	85.55	86.50	83	NO POND	0	4	12	-	-
EXIST. NO.	RYCB	200	PVC	5.85	1.29	[illegible]	S19 PERFORATED	-	86.15	94	NO POND	0	-	-	-	-
	RYCB 101	200	PVC	22.00	1.29	[illegible]	S19 PERFORATED	-	86.24	102	NO POND	0	-	-	-	-



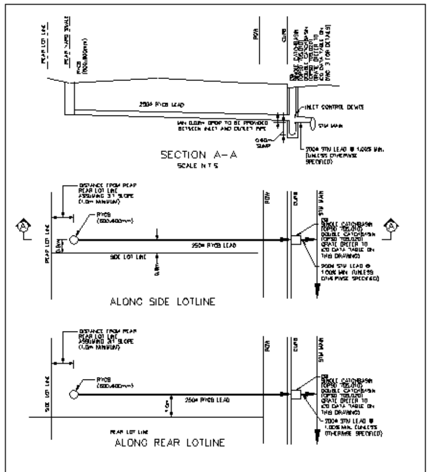
SERVICE CONNECTIONS UNDER DRIVEWAYS
NTS



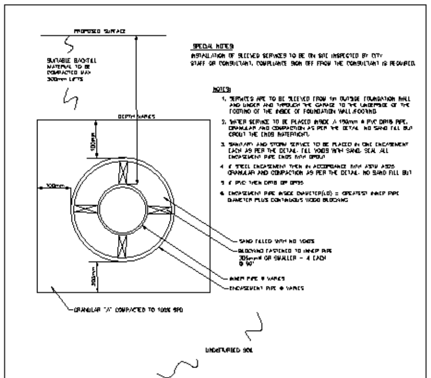
SPEED HUMP DETAIL



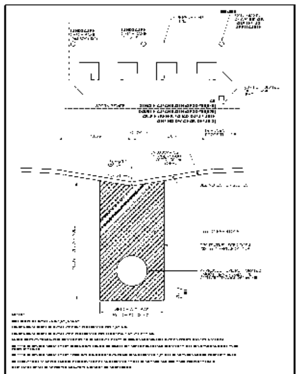
TYPICAL SINGLE, SEMI-DETACHED AND TOWNHOUSE LOT SERVICING



RYCB DETAIL (TYPICAL)
(SINGLE)
N.T.S.



SERVICE ENCASEMENT DETAIL FOR UNDER GARAGE
N.T.S.



PERFORATED PIPE INSTALLATION FOR REAR YARD AND LANDSCAPING APPLICATIONS

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19. SURVEY DATED SEPTEMBER, 2020.
LEGAL INFORMATION
M-PLAN PROVIDED BY J.D. BARNES, PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE
LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.29m ON THE TOP OF SPINDLE. ELEVATION = 89.293m.

No.	BY	DATE	DESCRIPTION
3	WL	22-08-29	3rd SUBMISSION (BY DSEL)
2	WL	22-08-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

s.21

© DSEL

DETAILS AND TABLE

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

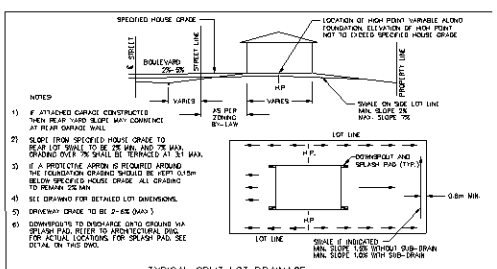
DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: A.K./W.B.	CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: C.M.	3
SCALE: 1:500	DATE: DECEMBER 2021	

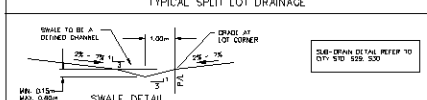
CITY FILE No. D07-16-21-0001 CITY PLAN No. 18616

CURB TYPE AND PAVEMENT DESIGN TABLE

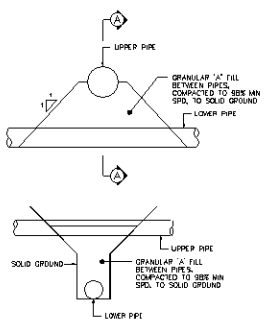
STREET NAME	CURB TYPE	CURB STANDARD	PAVEMENT DESIGN
VOIE RYAN REYNOLDS WAY (NORTH SIDE) (STA. 0+013.850 TO 0+086.853) (STA. 0+172.536 TO 0+217.875) (STA. 0+430.577 TO 0+437.359) (STA. 0+447.535 TO 0+512.653) (STA. 0+560.971 TO 0+625.912) VOIE RYAN REYNOLDS WAY (SOUTH SIDE) (STA. 0+013.295 TO 0+058.537) (STA. 0+144.769 TO 0+187.449) (STA. 0+218.142 TO 0+229.840) (STA. 0+439.140 TO 0+504.578) (STA. 0+553.845 TO 0+627.793) VOIE RYAN REYNOLDS WAY (EAST SIDE) (STA. 0+102.700 TO 0+127.780) (STA. 0+229.640 TO 0+346.064) (STA. 0+388.328 TO 0+430.577) AVE BROADCAST AVENUE (NORTH SIDE) (STA. 0+035.368 TO 0+112.285) AVE BROADCAST AVENUE (SOUTH SIDE) (STA. 0+036.511 TO 0+112.371)	CONCRETE MOUNTABLE CURB	SC1.3	-40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE -50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE -150mm OPSS GRANULAR A CRUSHED STONE -400mm OPSS GRANULAR B TYPE II
VOIE RYAN REYNOLDS WAY AVE BROADCAST AVENUE RUE SCULPIN STREET	CONCRETE BARRIER CURB	SC1.1	-40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE -50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE -150mm OPSS GRANULAR A CRUSHED STONE -400mm OPSS GRANULAR B TYPE II



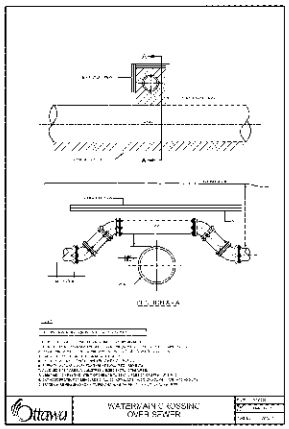
TYPICAL SPLIT LOT DRAINAGE

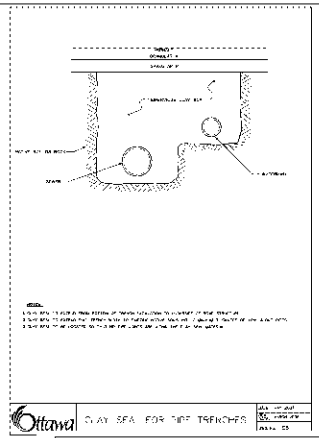


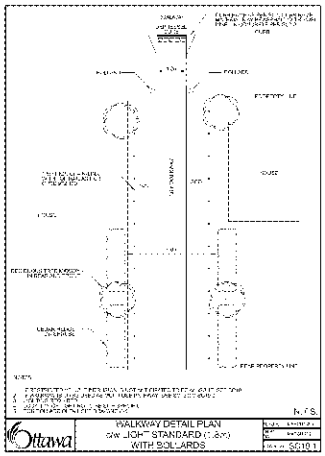
TYPICAL GRADE CONTROL REQUIREMENTS
N.T.S

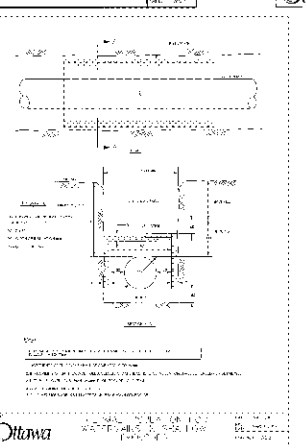


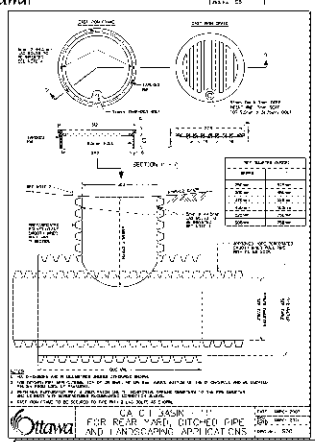
PIPE CROSSING DETAIL
SCALE: N.T.S.

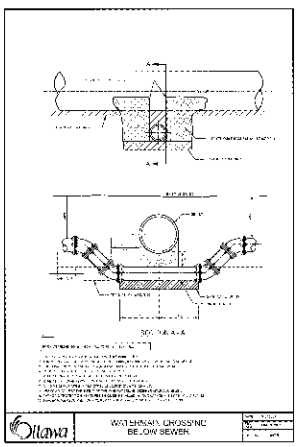


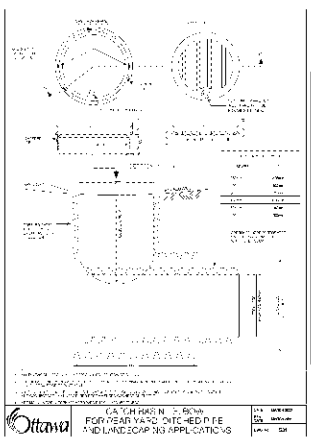


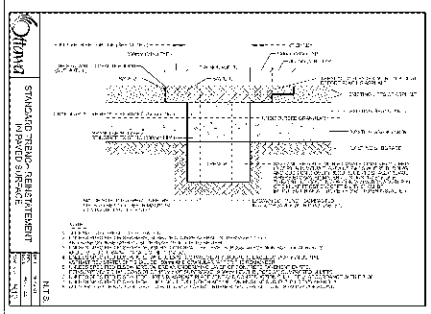


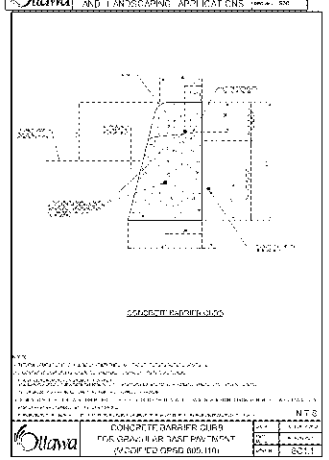












TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 16048-19 SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION
M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE
LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (GOV. JOB NO. 16048-19) PROVIDED AT THE EVENING FIRE HYDRANT ALONG BRYAN DOBLER BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m+ ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	WL	22-08-29	3rd SUBMISSION (BY DSEL)
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

DETAILS

CAIVAN (MER BLEUE) INC.

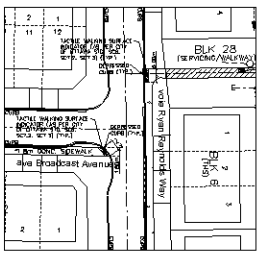
CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.dsel.ca

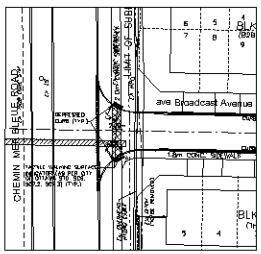
DRAWN BY: AJK/WL	CHECKED BY: WL	SHEET NO.
DESIGNED BY: WL	CHECKED BY: CM	4
SCALE: 1:500	DATE: DECEMBER 2021	

CITY FILE No. D07-16-21-0001 CITY PLAN No. 16816

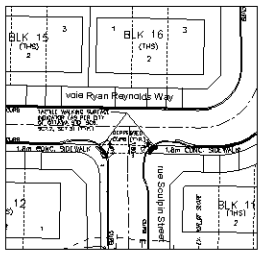
000501



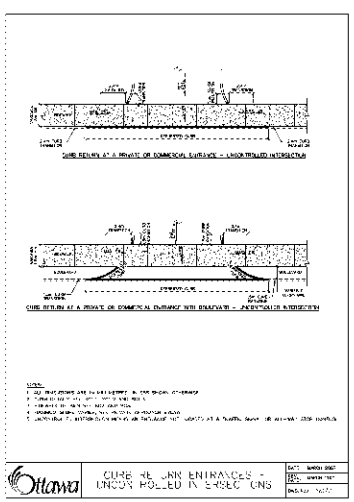
SINGLE CROSSWALK INTERSECTIONS
ave Broadcast Avenue at vole Ryan Reynolds Way
SCALE 1:500



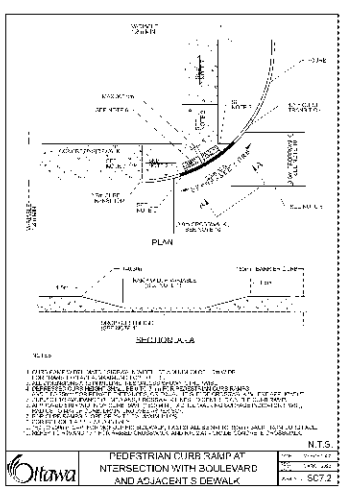
SINGLE CROSSWALK INTERSECTION
ave Broadcast Avenue at chemin Mer Bleue road
SCALE 1:500



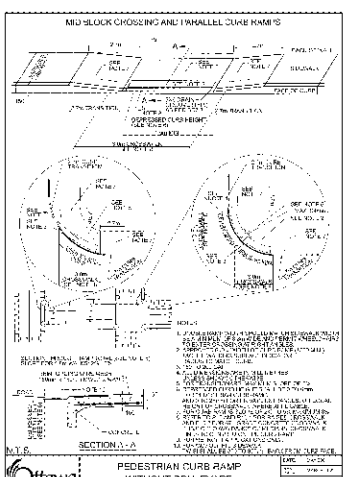
SINGLE CROSSWALK INTERSECTION
rue Sculpin Street at vole Ryan Reynolds Way
SCALE 1:500



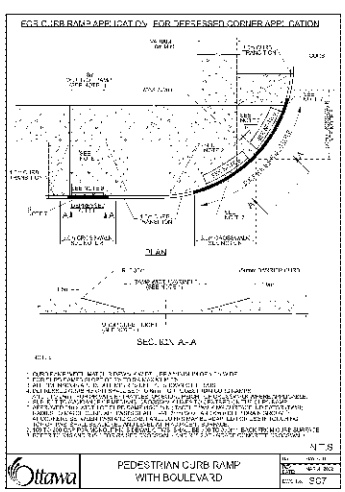
CURB RETURN ENTRANCES - UNCONTROLLED INTERSECTIONS



PEDESTRIAN CURB RAMP AT INTERSECTION WITH BOULEVARD AND ADJACENT SIDEWALK



PEDESTRIAN CURB RAMP WITHOUT BOULEVARD



PEDESTRIAN CURB RAMP WITH BOULEVARD

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19 SURVEY DATED SEPTEMBER, 2020
LEGAL INFORMATION
M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE
LOCAL JOB BENCHMARK REFERRED TO THE CANADA GEODETIC DATUM (MOV. JOB NO. 18048-19) PROVIDED AT THE EVENING FAT HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 88.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	WL	22-08-29	3rd SUBMISSION (BY DSEL)
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

s.21

© DSEL

TWSI DETAILS

CAIVAN (MER BLEUE) INC.

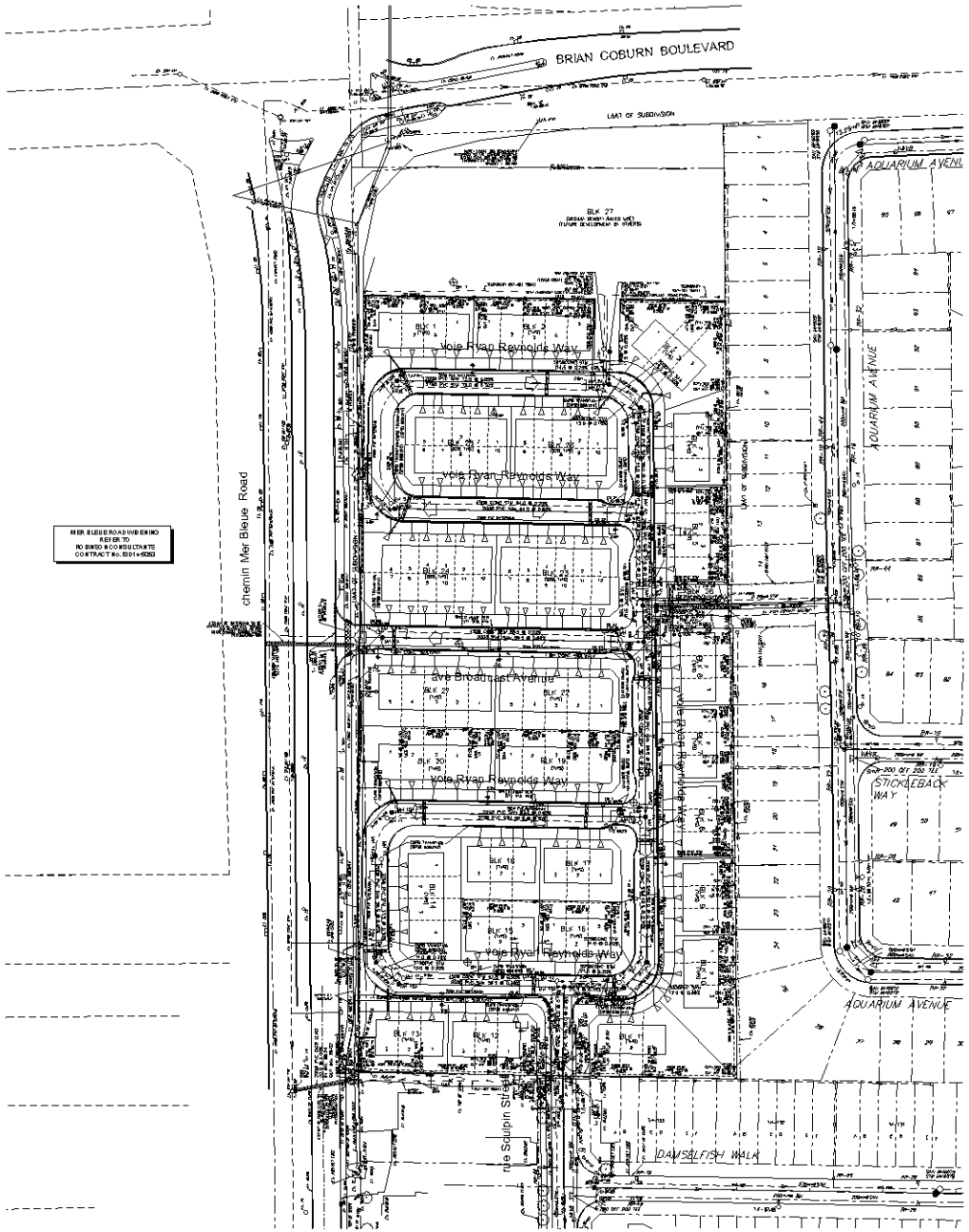
CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

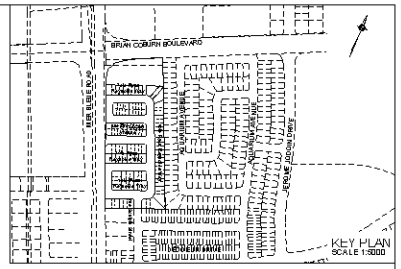
DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.dsel.ca

DRAWN BY: A.K./W.B.	CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: C.M.	5
SCALE: 1:500	DATE: DECEMBER 2021	

CITY FILE No. D07-16-21-0001 CITY PLAN No. 18816

000502

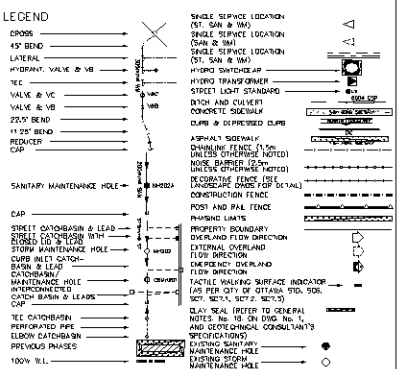




NOTES:

1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF E.C. UNDERGROUND SERVICES AND C.U. UTILITIES PRIOR TO STARTING CONSTRUCTION.
3. ALL EXISTING ABOVE GROUND FEATURES, E.G. MH/CHAMBER COVERS, PEDESTALS, HYDRO AND LIGHT POLES, ETC. AFFECTED BY THE DEVELOPMENT TO BE ADJUSTED TO SUIT TO THE SATISFACTION OF PARTIES AFFECTED.
4. ALL EXISTING BUILDING, SHED, POST & WIRE FENCE, CHAIN LINK FENCE, TREE, UTILITY WIRE, POLE, CULVERT AND POOL WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED.
5. ALL EXISTING POST & WIRE FENCE, CULVERTS, UTILITY WIRE / POLES, TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED.
6. PERMISSION REQUIRED FOR REMOVAL OF EXISTING TREES ON EXTERNAL LANDS WHERE APPLICABLE.
7. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS.
8. FOR BLOCK LAYOUT & TYPICAL EASEMENT DETAIL REFER TO DRAWING No. 4
9. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEER'S RECOMMENDATION.
10. FOR WATERMAIN CROSSING BELOW AND ABOVE SEWERS, REFER TO CITY STD. 1105 AND 1905.2, RESPECTIVELY, WHERE APPLICABLE.
11. ALL WATERMAIN CONNECTIONS AND DECOMMISSIONING OF EXISTING WATERMAINS TO BE COMPLETED BY CITY FORCES. TRENCH BACKFILL/REINSTATEMENT TO BE COMPLETED BY THE CONTRACTOR TO THE SATISFACTION OF THE CITY OF OTTAWA.
12. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED.
13. THE COVER OF EX. MH, CB, CB/MH/BC AND OTHER ABOVE GROUND FEATURES TO BE ADJUSTED TO SUIT THE NEW FINISHED GRADE, WHERE APPLICABLE.
14. INSULATION REQUIRED FOR WATERMAIN / WATER SERVICE WHERE THE SEPARATION BETWEEN WATERMAIN / WATER SERVICE AND OTHER SERVICES AND STRUCTURES IS LESS THAN 1.0m AND THE COVER IS LESS THAN 2.4m. REFER TO CITY STD. 1203 FOR DETAILS.
15. FOR SERVICE INSTALLATION AT SEWER CROSSING, REFER TO CITY STD. 1018 FOR DETAIL.
16. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS, SLEEVE SHALL BE USED UNDER THE GARAGE SLAB.
17. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS.
18. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG. 3 FOR DETAILS.

LEGEND



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES. PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE GEODETIC DATUM (ADV JOB NO. 18048-19) ESTABLISHED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 99.36m ON THE TOP OF SPINDLE ELEVATED = 99.360m

No	BY	DATE	DESCRIPTION
3	WL	22-06-29	3rd SUBMISSION (BY DSEL)
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-06	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENCE OF PROFESSIONAL ENGINEER s.21 PROVINCE OF ONTARIO

GENERAL PLAN

DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.dsel.ca

DRAWN BY: A.K./V.B.	CHECKED BY: W.L.	SHEET NO.	
DESIGNED BY: W.L.	CHECKED BY: C.M.	6	
SCALE: 1:500	DATE: DECEMBER 2021		

CITY FILE No. D07-16-21-0001 CITY PLAN No. 18616

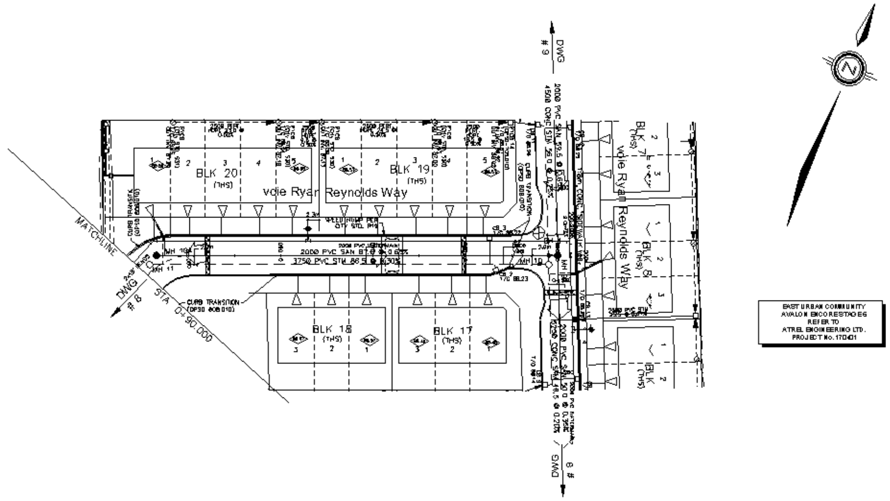
000503

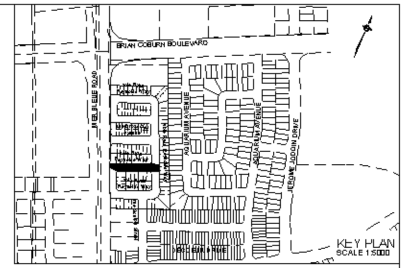
PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm OPSS GRANULAR A CRUSHED STONE
400mm OPSS GRANULAR B TYPE II

NOTES.

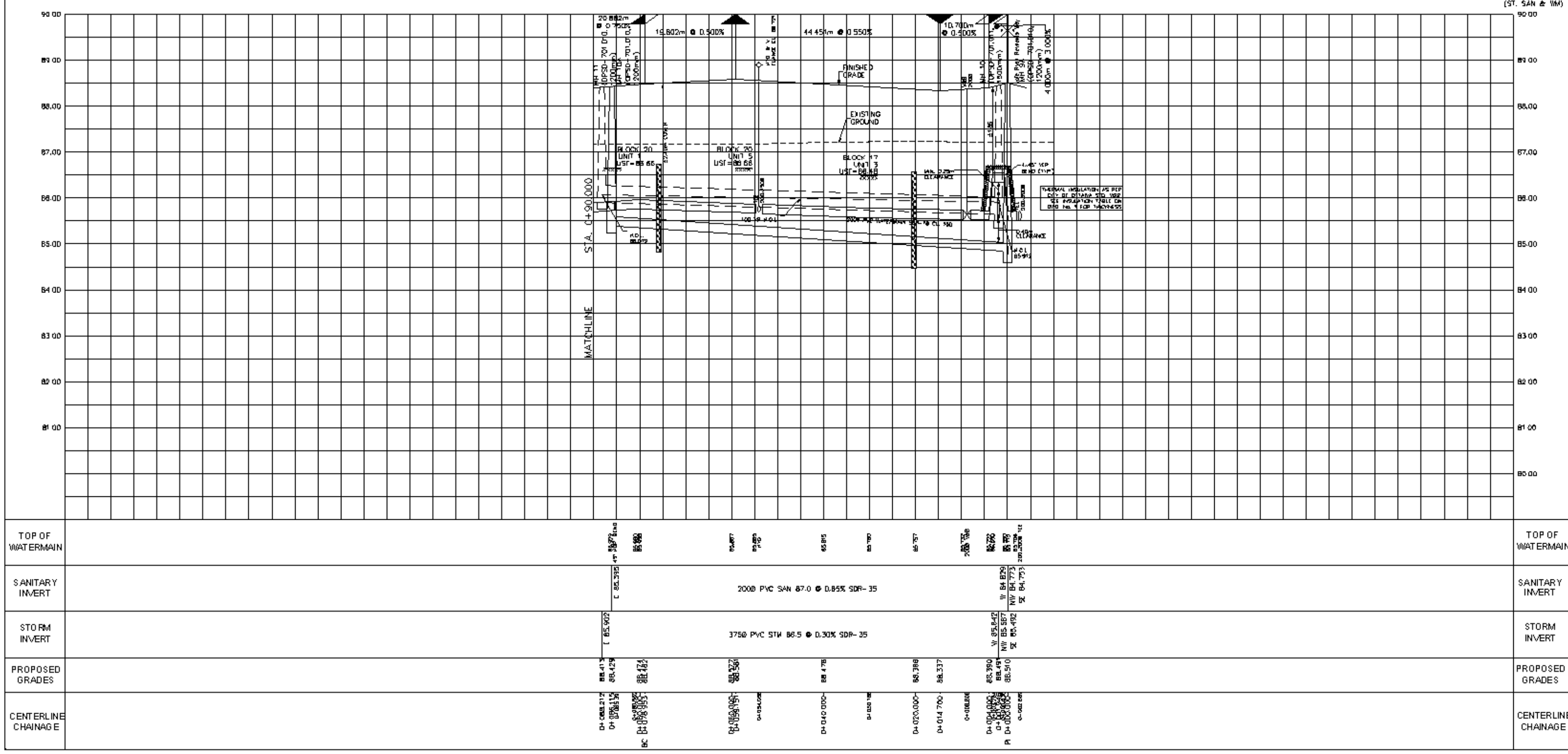
1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG. 3 FOR DETAILS.





LEGEND

- CROSS
- 45° BEND
- LATERAL
- HYDRANT, VALVE & VB
- TEE
- VALVE & VC
- VALVE & VB
- 22.5° BEND
- 11.25° BEND
- REDUCER
- CAP
- SANITARY MAINTENANCE HOLE
- CAP
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD
- STORM MAINTENANCE HOLE
- CURB INLET CATCHBASIN & LEAD
- CATCHBASIN / MAINTENANCE HOLE
- INTERCONNECTED CATCH BASIN & LEADS
- CAP
- SINGLE SERVICE LOCATION (ST. SAN & WM)
- SINGLE SERVICE LOCATION (SAN & WM)
- SINGLE SERVICE LOCATION (ST. SAN & WM)
- HYDRO TRANSFORMER
- STREET LIGHT STANDARD
- CONCRETE SIDEWALK
- CURB & DEPRESSED CURB
- ASPHALT SIDEWALK
- CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
- NOISE BARRIER (2.5m UNLESS OTHERWISE NOTED)
- DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
- CONSTRUCTION FENCE
- POST AND RAIL FENCE
- PHASING LIMITS
- PROPERTY BOUNDARY
- BOREHOLE (BH), TEST PIT (TP), AUGER HOLE (AH), MONITORING WELL LOCATION, CONCEPTUAL WELL LOCATION — AS PER GEOTECHNICAL REPORT
- LOT NUMBER
- UNDERSIDE OF FOOTING ELEVATION
- UNITS REQUIRING PRESSURE REDUCING VALVES
- WALKOUT UNITS
- SLAB ON GRADE
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6, SC7, SC7.1, SC7.2, SC7.3)
- PREVIOUS PHASES
- CLAY SEAL (REFER TO GENERAL NOTES No. 18 ON DWG No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- INFERRED TOP OF BEDROCK ELEVATION PROVIDED BY PATERSON GROUP IN NOVEMBER 2018
- TEE CATCHBASIN
- PERFORATED PIPE
- ELBOW CATCHBASIN
- DITCH AND CULVERT
- EXISTING SANITARY MAINTENANCE HOLE
- EXISTING STORM MAINTENANCE HOLE



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00. SURVEY DATED DEC 23. 2020 AND MARCH 24. 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19. SURVEY DATED SEPTEMBER. 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00. RECEIVED ON MARCH 15. 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER
s.21
PROVINCE OF ONTARIO

voie Ryan Reynolds Way

STA. 0+0.000 TO STA. 0+90.000

© DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY. AK/VW	CHECKED BY. WL	SHEET NO.
DESIGNED BY. W.L.	CHECKED BY. CM	7
SCALE: H=1:500/V=1:50	DATE: DECEMBER 2021	

CITY PLAN No. 18616

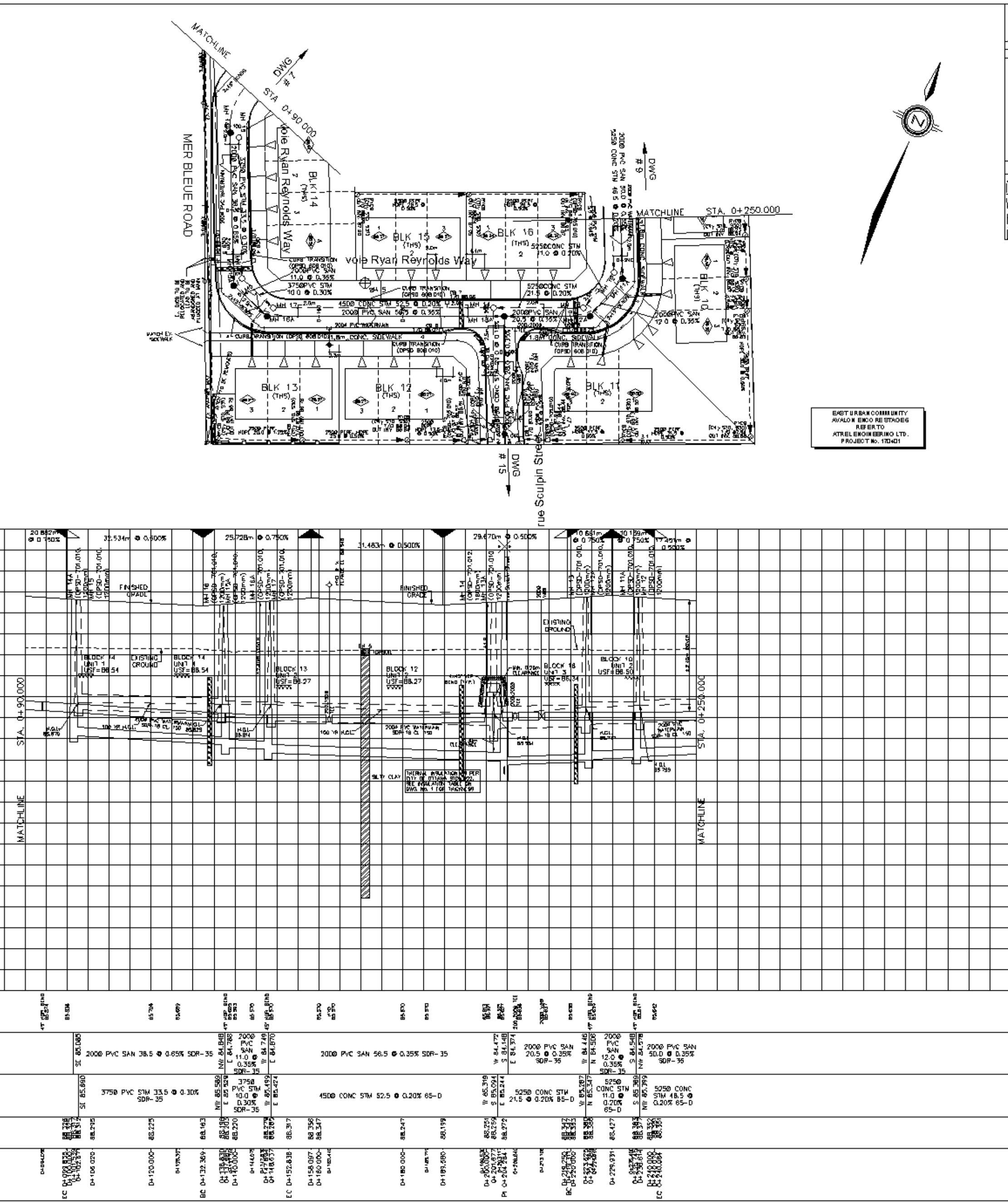
CITY FILE No. D07-16-21-0001

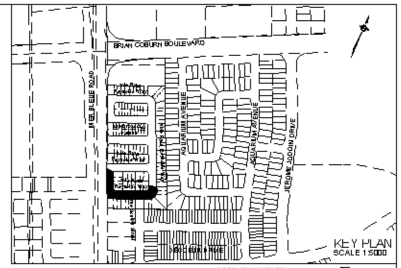
PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm OPSS GRANULAR A CRUSHED STONE
400mm OPSS GRANULAR B TYPE II

NOTES.

1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG. 3 FOR DETAILS.





LEGEND

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER [redacted] s.21 22-06-29 PROVINCE OF ONTARIO

voie Ryan Reynolds Way © DSEL
STA. 0+90.000 TO STA. 0+250.000

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: AK/VW	CHECKED BY: WL	SHEET NO.
DESIGNED BY: W.L	CHECKED BY: CM	8
SCALE: H=1:500/V=1:50	DATE: DECEMBER 2021	

CITY PLAN No. 18616

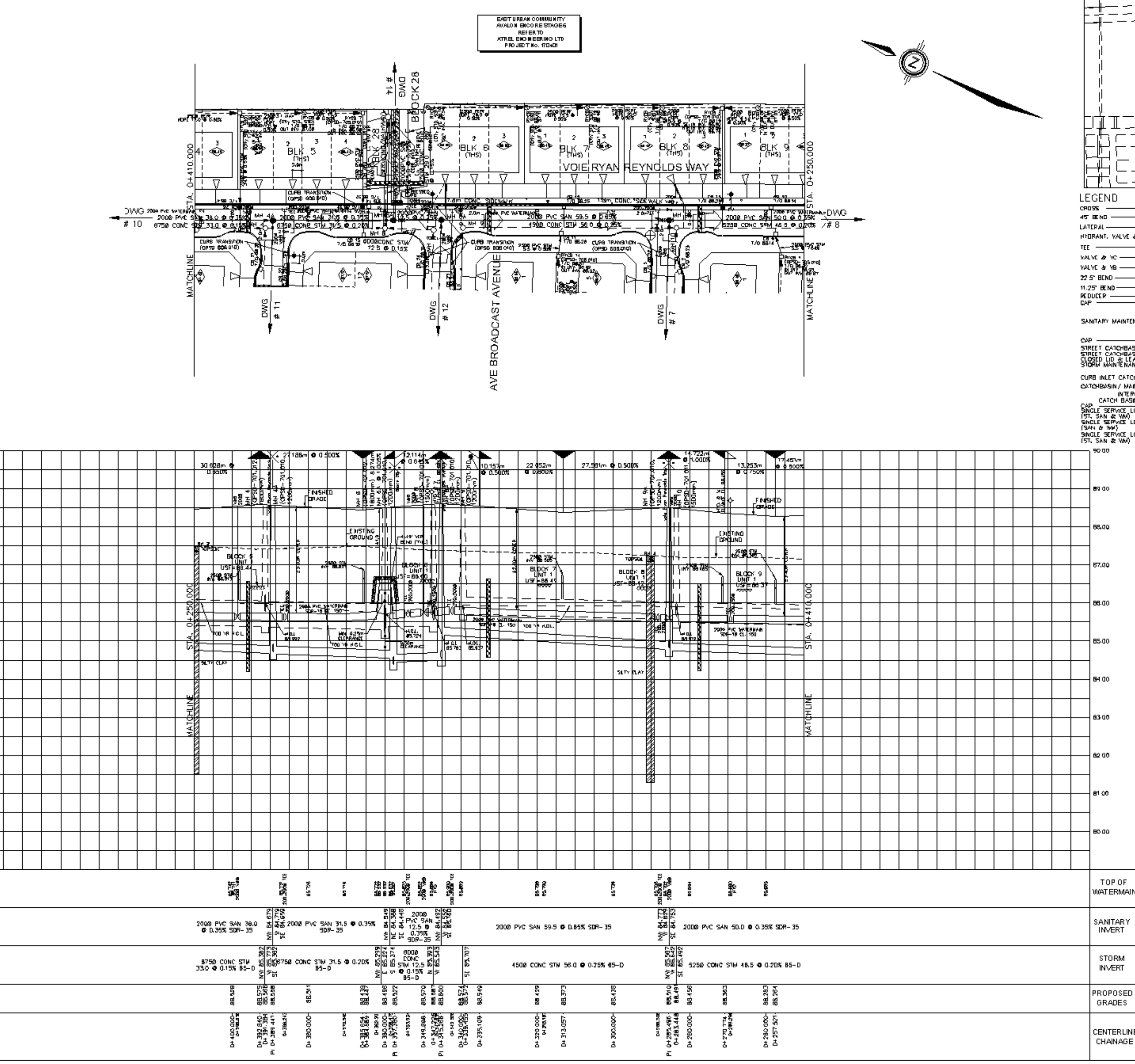
CITY FILE No. D07-16-21-0001

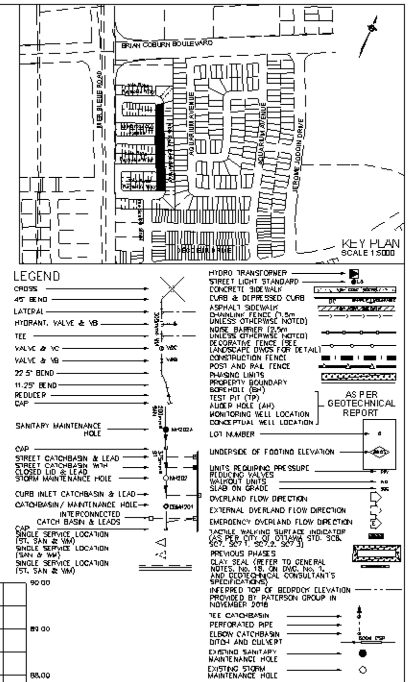
PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm OPSS GRANULAR A CRUSHED STONE
400mm OPSS GRANULAR B TYPE II

NOTES.

1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG. 3 FOR DETAILS.





TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

[redacted]

voie Ryan Reynolds Way
STA. 0+250.000 TO STA. 0+410.000

© DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION
(2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY. AK/VW	CHECKED BY. WL	SHEET NO.
DESIGNED BY. W.L	CHECKED BY. CM	9
SCALE: H=1:500/V=1:50	DATE: DECEMBER 2021	

CITY PLAN No. 18616

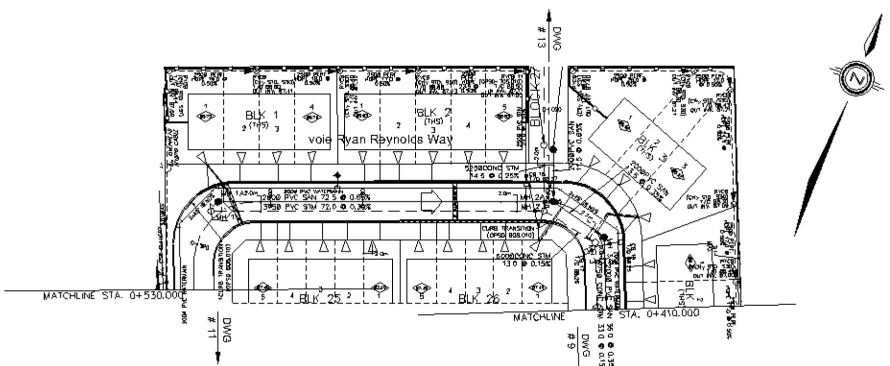
CITY FILE No. D07-16-21-0001

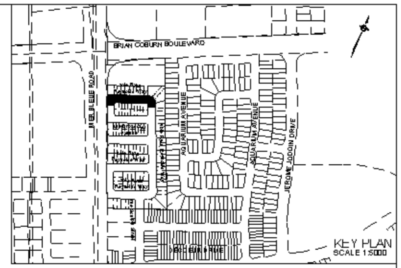
PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm OPSS GRANULAR A CRUSHED STONE
400mm OPSS GRANULAR B TYPE II

NOTES.

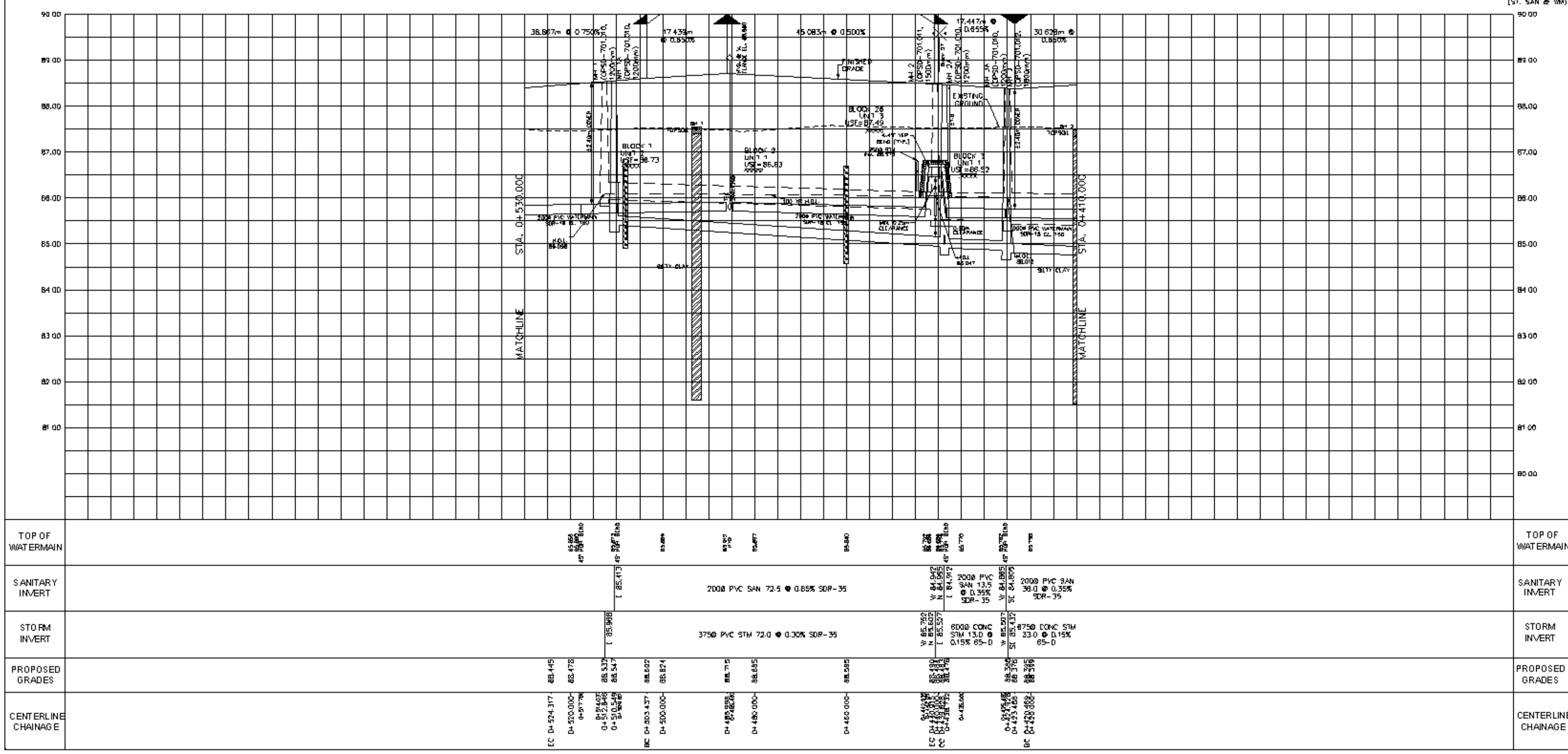
1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG 3 FOR DETAILS.





LEGEND

- CROSS
- 45° BEND
- LATERAL
- HYDRANT, VALVE & VB
- TEE
- VALVE & VC
- VALVE & VB
- 22.5° BEND
- 11.25° BEND
- REDUCER
- CAP
- SANITARY MAINTENANCE HOLE
- CAP
- STREET CATCHBASIN & LEAD
- STREET CATCHBASIN WITH CLOSED LID & LEAD
- STORM MAINTENANCE HOLE
- CURB INLET CATCHBASIN & LEAD
- CATCHBASIN / MAINTENANCE HOLE
- INTERCONNECTED CATCH BASIN & LEADS
- CAP
- SINGLE SERVICE LOCATION (ST. SAN & WM)
- SINGLE SERVICE LOCATION (SAN & WM)
- SINGLE SERVICE LOCATION (ST. SAN & WM)
- HYDRO TRANSFORMER
- STREET LIGHT STANDARD
- CONCRETE SIDEWALK
- CURB & DEPRESSED CURB
- ASPHALT SIDEWALK
- CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
- NOISE BARRIER (2.5m UNLESS OTHERWISE NOTED)
- DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
- CONSTRUCTION FENCE
- POST AND RAIL FENCE
- PHASING LIMITS
- PROPERTY BOUNDARY
- BOREHOLE (BH), TEST PIT (TP), AUGER HOLE (AH), MONITORING WELL LOCATION, CONCEPTUAL WELL LOCATION — AS PER GEOTECHNICAL REPORT
- LOT NUMBER
- UNDERSIDE OF FOOTING ELEVATION
- UNITS REQUIRING PRESSURE REDUCING VALVES
- WALKOUT UNITS
- SLAB ON GRADE
- OVERLAND FLOW DIRECTION
- EXTERNAL OVERLAND FLOW DIRECTION
- EMERGENCY OVERLAND FLOW DIRECTION
- TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6, SC7, SC7.1, SC7.2, SC7.3)
- PREVIOUS PHASES
- CLAY SEAL (REFER TO GENERAL NOTES No. 18 ON DWG No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
- INFERRED TOP OF BEDROCK ELEVATION PROVIDED BY PATERSON GROUP IN NOVEMBER 2018
- TEE CATCHBASIN
- PERFORATED PIPE
- ELBOW CATCHBASIN
- DITCH AND CULVERT
- EXISTING SANITARY MAINTENANCE HOLE
- EXISTING STORM MAINTENANCE HOLE



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (ADV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER s.21 22-06-29 PROVINCE OF ONTARIO

voie Ryan Reynolds Way

STA 0+410.000 TO STA 0+530.000

© DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: AK/VW	CHECKED BY: WL	SHEET NO.
DESIGNED BY: W.L	CHECKED BY: CM	10
SCALE: H=1:500/V=1:50	DATE: DECEMBER 2021	

CITY PLAN No. 18616

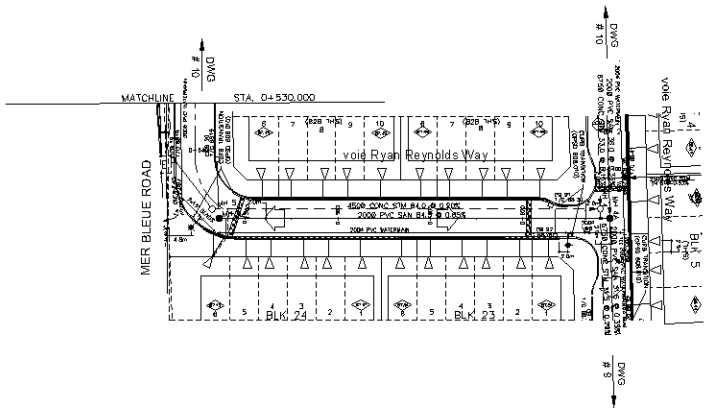
CITY FILE No. D07-16-21-0001

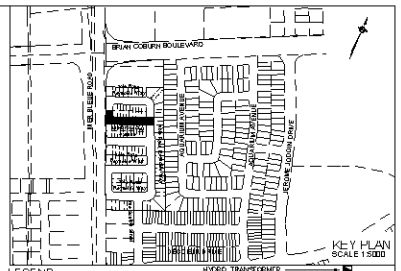
PAVEMENT DESIGN

40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm OPSS GRANULAR A CRUSHED STONE
400mm OPSS GRANULAR B TYPE II

NOTES.

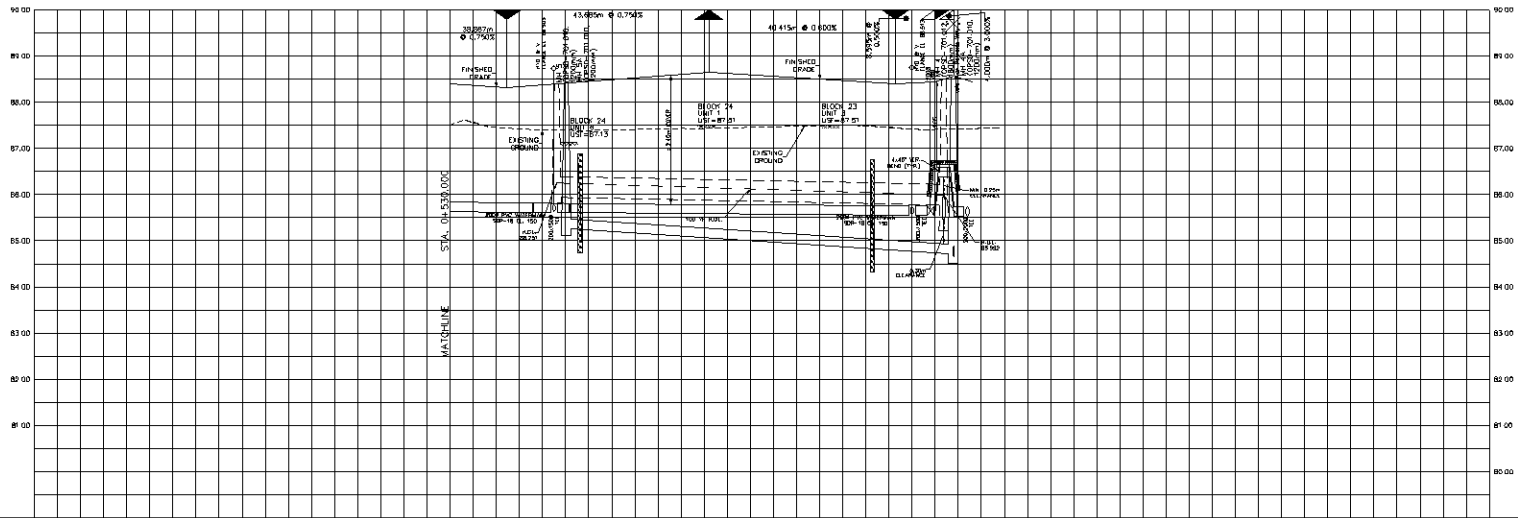
1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF EX. UNDERGROUND SERVICES AND EX. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. TOP WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED.
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG. 3 FOR DETAILS.





LEGEND

CROSS
45° BEND
LATERAL
HYDRANT, VALVE & VB
TEE
VALVE & VC
VALVE & VB
22.5° BEND
11.25° BEND
REDUCER
CAP
SANITARY MAINTENANCE HOLE
CAP
STREET CATCHBASIN & LEAD
STREET CATCHBASIN WITH CLOSED TOP & LEAD
STORM MAINTENANCE HOLE
CURB INLET CATCHBASIN & LEAD
CATCHBASIN/ MAINTENANCE HOLE-INTERCONNECTED CATCH BASIN & LEADS
GAS SINGLE SERVICE LOCATION (ST. SAN & WM)
SINGLE SERVICE LOCATION (SAN & WM)
SINGLE SERVICE LOCATION (ST. SAN & WM)
HYDRO TRANSFORMER
STREET LIGHT STANDARD
CONCRETE SIDEWALK
CURB & DEPRESSED CURB
ASPHALT SIDEWALK
CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
NOISE BARRIER (2.5m UNLESS OTHERWISE NOTED)
DECORATIVE FENCE (1.8m)
LANDSCAPE SWDS (TOP DETAIL)
CONSTRUCTION FENCE
POST AND RAIL FENCE
PHASING LIMITS
PROPERTY BOUNDARY
BOREHOLE (BH)
TEST PIT (TP)
AUGER HOLE (AH)
MONITORING WELL LOCATION
CONCEPTUAL WELL LOCATION
AS PER GEOTECHNICAL REPORT
LOT NUMBER
UNDERSIDE OF FOOTING ELEVATION
LIMITS REQUIRING PRESSURE REDUCING VALVES
MAXIMUM UNITS
SLAB ON GRADE
OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
EMERGENCY OVERLAND FLOW DIRECTION
TACTILE WALKING SURFACE INDICATOR (AS PER OPSD 310.010, 310.020, 310.030, SET-1, SET-2, SET-3)
PREVIOUS PHASES
CLAY SEAL (REFER TO GENERAL NOTES, No. 16 ON DWG. No. 1 AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS)
INFERRED TOP OF BEDROCK ELEVATION PROVIDED BY PATERSON GROUP IN NOVEMBER 2016
TEE CATCHBASIN
PERFORATED PIPE
ELBOW CATCHBASIN
DITCH and CULVERT
EXISTING SANITARY MAINTENANCE HOLE
EXISTING STORM MAINTENANCE HOLE



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY JANIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES, PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JDB BENCHMARK REFERRED TO THE GEODETIC DATUM (JDB JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 99.26m ON THE TOP OF SPINDLE ELEVATION = 98.208

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

voie Ryan Reynolds Way
STA. 0+530.000 TO STA. 0+649.000

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax (613) 836-7183
www.dsel.ca

DRAWN BY: AK /V-W	CHECKED BY: W.L	SHEET NO.
DESIGNED BY: W.L	CHECKED BY: C.M	11
SCALE: H= 1:500/V=1:50	DATE: DECEMBER 2021	

CITY PLAN No. 18616

CITY FILE No. D07-16-21-0001

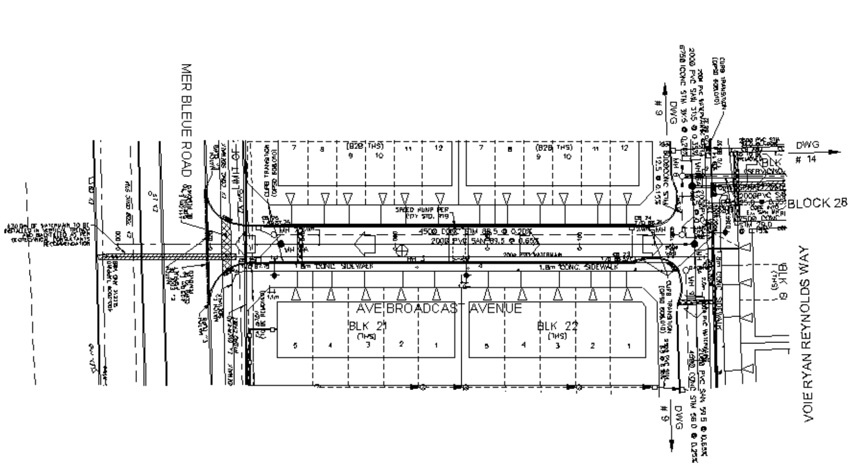
000508

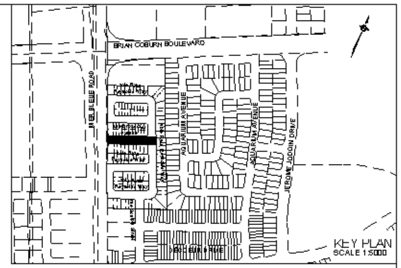
PAVEMENT DESIGN

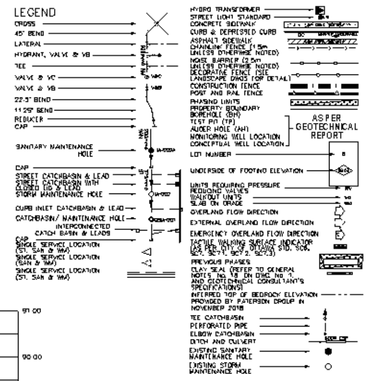
40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm OPSS GRANULAR A CRUSHED STONE
400mm OPSS GRANULAR B TYPE II

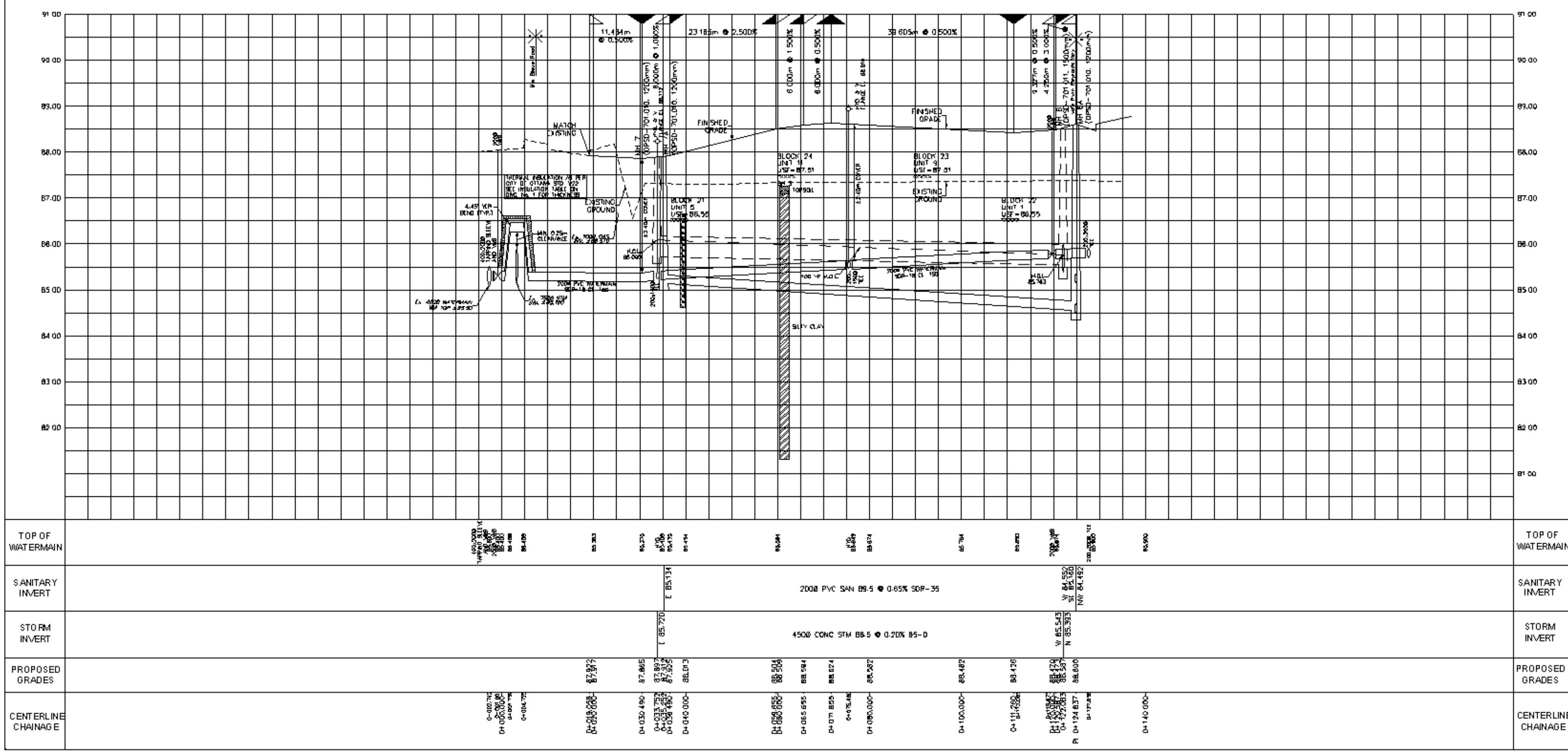
NOTES.

1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG. 3 FOR DETAILS.









TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER PROVINCE OF ONTARIO s.21

ave Broadcast Avenue
STA. 0+0.000 TO STA. 0+134.837
© DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

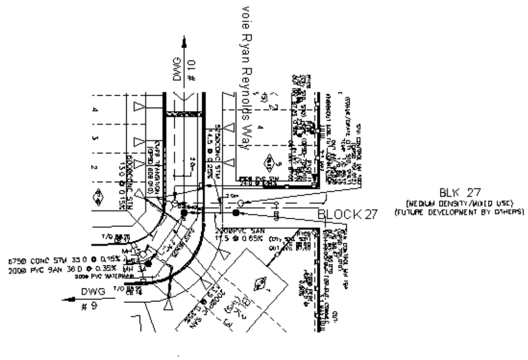
DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

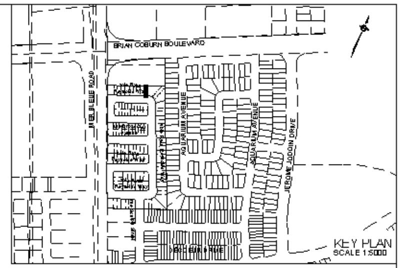
DRAWN BY: AK/VW	CHECKED BY: WL	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: CM	12
SCALE: H=1:500/V=1:50	DATE: DECEMBER 2021	

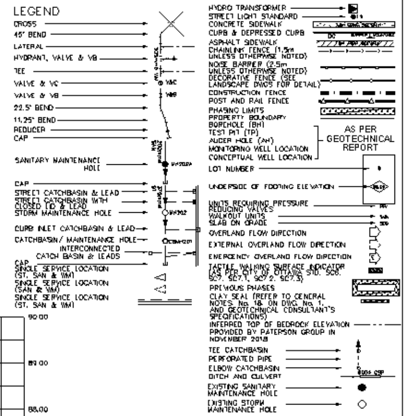
CITY PLAN No. 18616
CITY FILE No. D07-16-21-0001

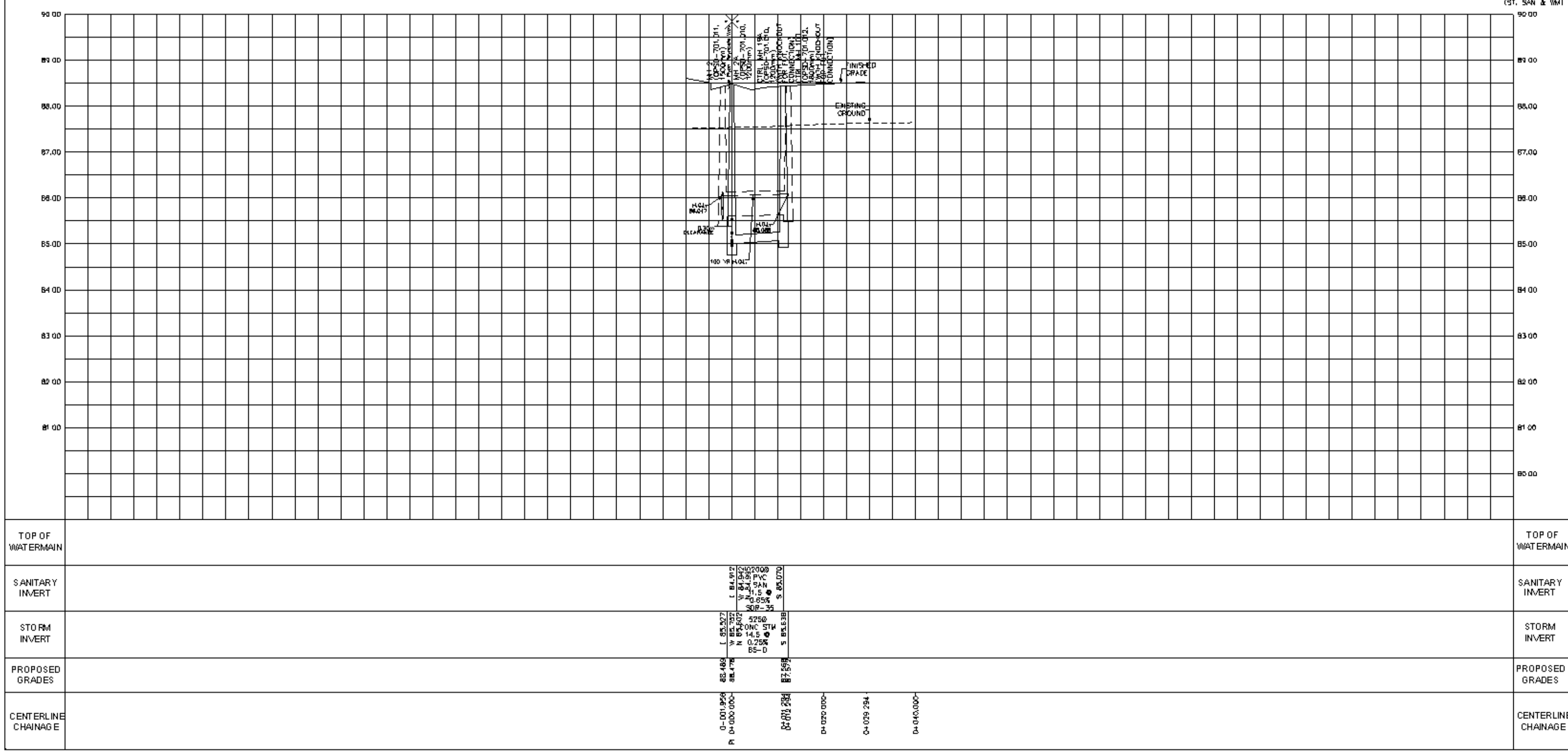
NOTES.

1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG. 3 FOR DETAILS.









TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER s.21 22-06-29 PROVINCE OF ONTARIO

© DSEL

Block 27 (MEDIUM DENSITY AND MIXED USE)

STA. 0+0.000 TO STA. 0+39.294

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

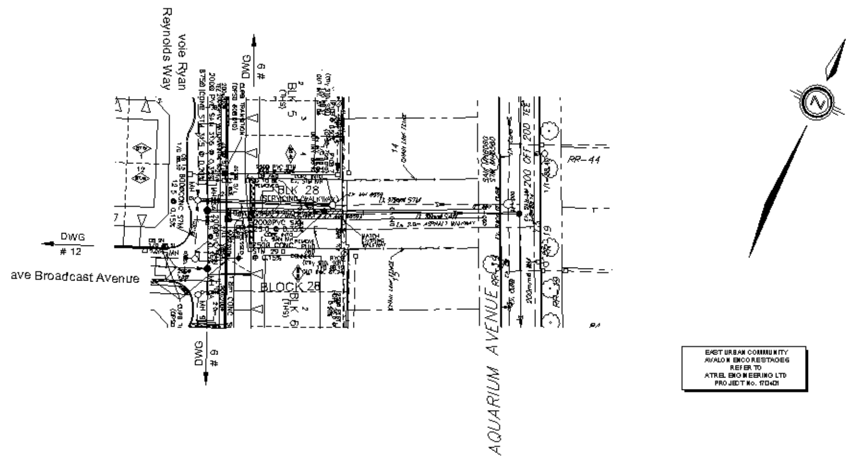
DRAWN BY: AK/VW	CHECKED BY: WL	SHEET NO.
DESIGNED BY: W.L	CHECKED BY: CM	
SCALE: H=1:500/V=1:50	DATE: DECEMBER 2021	

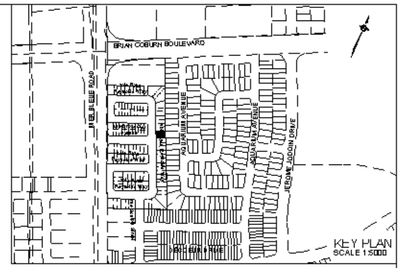
CITY PLAN No. 18616

CITY FILE No. D07-16-21-0001

NOTES.

1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG 3 FOR DETAILS.

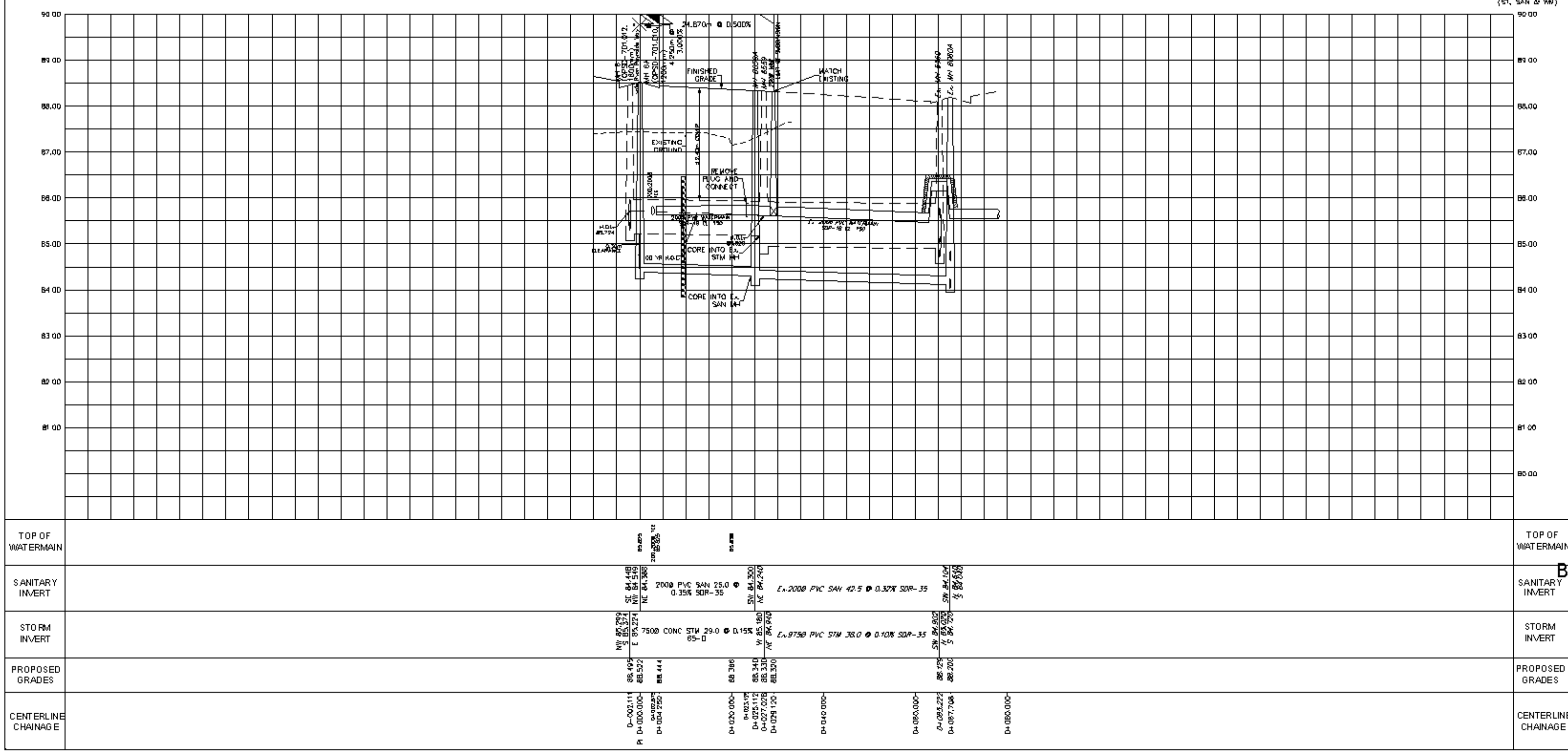




LEGEND

CROSS; 45° BEND; LATERAL; HYDRANT, VALVE & VB; TEE; VALVE & VC; VALVE & VB; 22.5° BEND; 11.25° BEND; REDUCER; CAP; SANITARY MAINTENANCE HOLE; CAP; STREET CATCHBASIN & LEAD; STREET CATCHBASIN WITH CLOSED LID & LEAD; STORM MAINTENANCE HOLE; CURB INLET CATCHBASIN & LEAD; CATCHBASIN/ MAINTENANCE HOLE; INTERCONNECTED CATCH BASIN & LEADS; CAP; SINGLE SERVICE LOCATION (ST, SAN & WM); SINGLE SERVICE LOCATION (SAN & WM); SINGLE SERVICE LOCATION (ST, SAN & WM)

HYDRO TRANSFORMER; STREET LIGHT STANDARD; CONCRETE SIDEWALK; CURB & DEPRESSED CURB; ASPHALT SIDEWALK; CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED); NOISE BARRIER (2.5m UNLESS OTHERWISE NOTED); DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL); CONSTRUCTION FENCE; POST AND RAIL FENCE; PHASING LIMITS; PROPERTY BOUNDARY; BOREHOLE (BH), TEST PIT (TP), AUGER HOLE (AH), MONITORING WELL LOCATION, CONCEPTUAL WELL LOCATION — AS PER GEOTECHNICAL REPORT; LOT NUMBER; UNDERSIDE OF FOOTING ELEVATION; UNITS REQUIRING PRESSURE REDUCING VALVES; WALKOUT UNITS; SLAB ON GRADE; OVERLAND FLOW DIRECTION; EXTERNAL OVERLAND FLOW DIRECTION; EMERGENCY OVERLAND FLOW DIRECTION; TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC8, SC7, SC7.1, SC7.2, SC7.3); PREVIOUS PHASES; CLAY SEAL (REFER TO GENERAL NOTES No. 18, ON DWG No. 1, AND GEOTECHNICAL CONSULTANT'S SPECIFICATIONS); INFERRED TOP OF BEDROCK ELEVATION PROVIDED BY PATERSON GROUP IN NOVEMBER 2018; TEE CATCHBASIN; PERFORATED PIPE; ELBOW CATCHBASIN; DITCH AND CULVERT; EXISTING SANITARY MAINTENANCE HOLE; EXISTING STORM MAINTENANCE HOLE



TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — s.21

© DSEL

Block 28 (SERVICING AND WALKWAY)

STA. 0+0.000 TO STA. 0+77.708

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: AK/VW	CHECKED BY: WL	SHEET NO.
DESIGNED BY: W.L	CHECKED BY: CM	14
SCALE: H=1:500/V=1:50	DATE: DECEMBER 2021	

CITY PLAN No. 18616

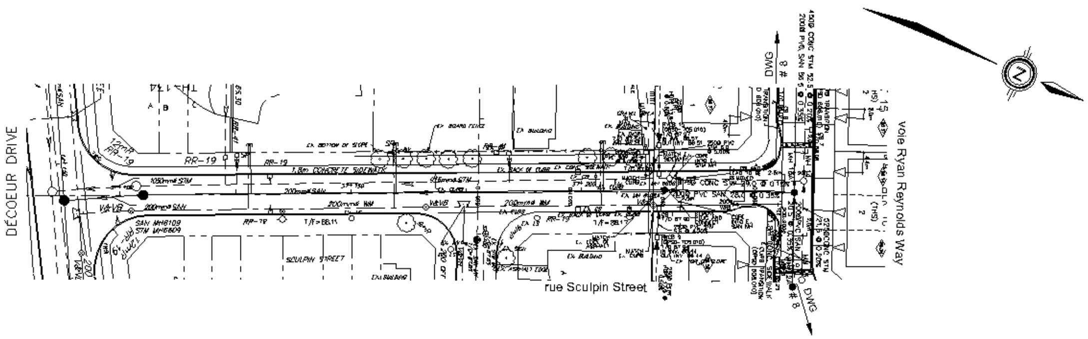
CITY FILE No. D07-16-21-0001

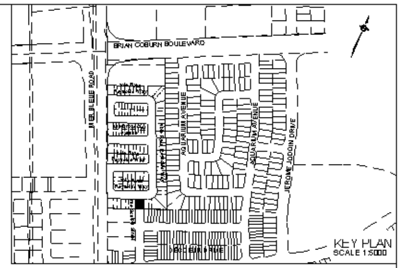
PAVEMENT DESIGN

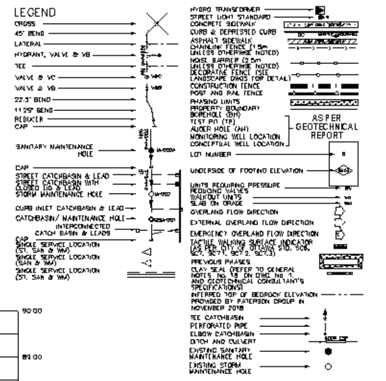
40mm SUPERPAVE 12.5 ASPHALTIC CONCRETE
50mm SUPERPAVE 19.0 ASPHALTIC CONCRETE
150mm OPSS GRANULAR A CRUSHED STONE
400mm OPSS GRANULAR B TYPE II

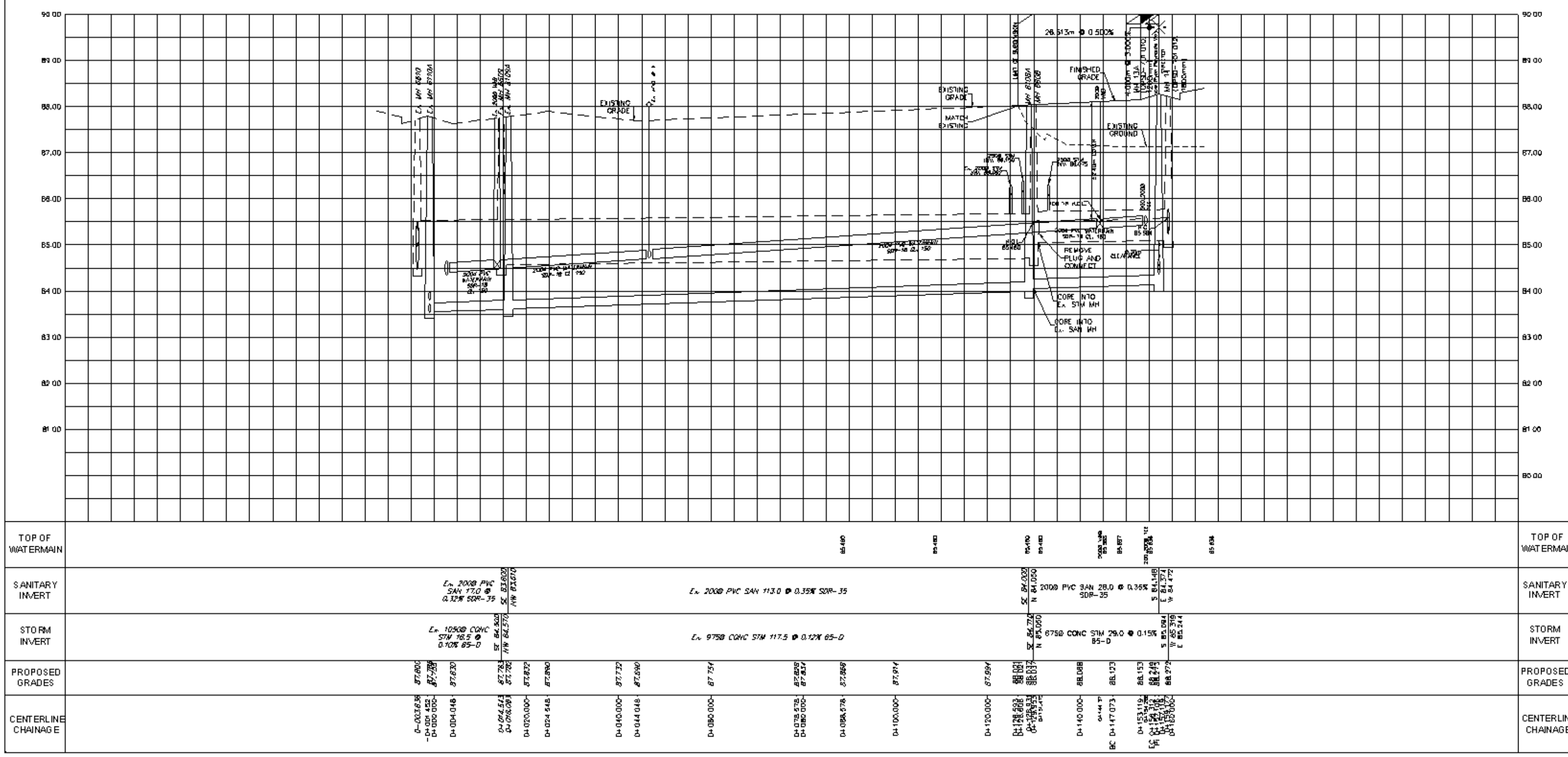
NOTES.

1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
4. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
5. FOR WATERMAIN STUBS, 2.4m MIN. COVER TO BE PROVIDED
6. ANY DISTURBED MATERIAL ENCOUNTERED BELOW THE SUBGRADE LEVEL WITHIN A BUILDING FOOTPRINT TO BE SUB-EXCAVATED AND BACKFILLED WITH COMPACTED ENGINEERED FILL AS PER GEOTECHNICAL ENGINEERS RECOMMENDATION
7. FOR CATCHBASIN DATA, REFER TO DWG. No. 3 FOR DETAILS
8. FOR HOUSE CONNECTIONS INSTALLED UNDER DRIVEWAYS AND GARAGES, SEE DWG. 3 FOR DETAILS.









TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022.
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED, PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER [redacted] s.21 PROVINCE OF ONTARIO

rue Sculpin Street

STA. 0+0.000 TO STA. 0+78.515

© DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

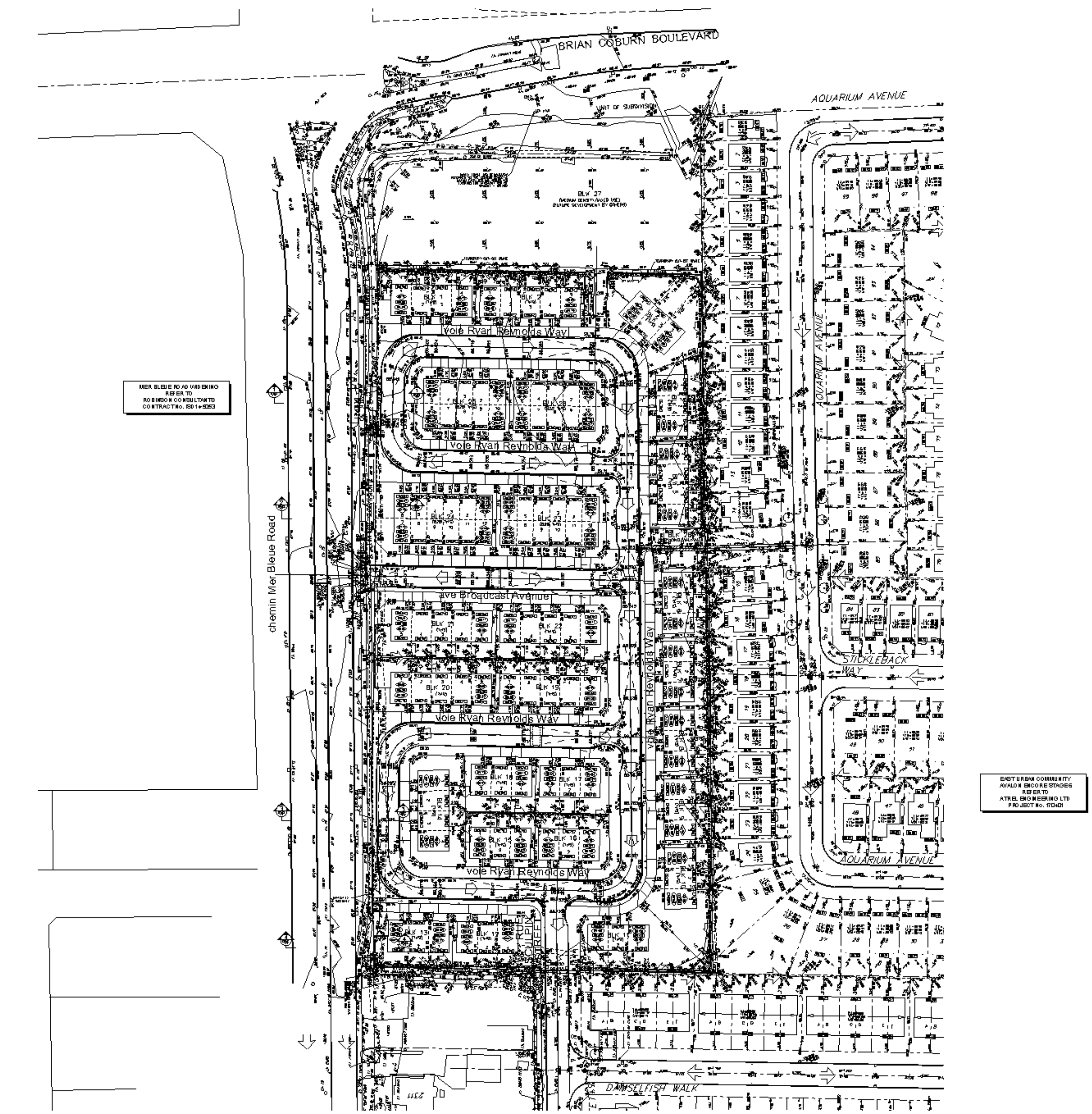
DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

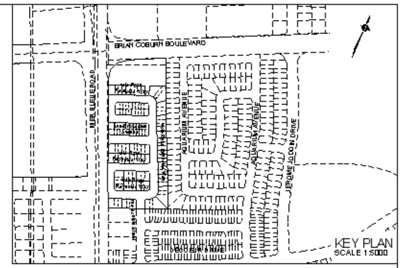
DRAWN BY: AK/VW	CHECKED BY: WL	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: CM	15
SCALE: H=1:500/V=1:50	DATE: DECEMBER 2021	

CITY PLAN No. 18616

CITY FILE No. D07-16-21-0001

000512





NOTES:

1. ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION
2. CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF Ex. UNDERGROUND SERVICES AND Ex. UTILITIES PRIOR TO STARTING CONSTRUCTION
3. ALL EXISTING ABOVE GROUND FEATURES, E.G. MH/CHAMBER COVERS, PEDESTALS, HYDRO AND LIGHT POLES, ETC. AFFECTED BY THE DEVELOPMENT TO BE ADJUSTED TO SUIT TO THE SATISFACTION OF PARTIES AFFECTED
4. ALL EXISTING BUILDING, SHED, POST & WIRE FENCE, CHAIN LINK FENCE, TREE, UTILITY WIRE, POLE, CULVERT AND POOL WITHIN LOTS AND BLOCKS TO BE REMOVED, UNLESS OTHERWISE NOTED
5. ALL EXISTING POST & WIRE FENCE, CULVERTS, UTILITY WIRE / POLES, TREES, SHRUBS ETC. WITHIN LOTS, BLOCKS AND ROADS TO BE REMOVED, UNLESS OTHERWISE NOTED
6. PERMISSION REQUIRED FOR REMOVAL OF EXISTING TREES ON EXTERNAL LANDS WHERE APPLICABLE
7. PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS
8. FOR RLCB LAYOUT & TYPICAL EASEMENT DETAIL REFER TO DRAWING No. 4
9. A GEOTECHNICAL ENGINEER LICENSED IN THE PROVINCE OF ONTARIO IS TO INSPECT ALL SUBGRADE SURFACES FOR FOOTING AND PAVEMENT STRUCTURES PRIOR TO CONSTRUCTION
10. PERFORATED PIPE IS REQUIRED FOR SWALE SLOPE LESS THAN 1.5% REFER TO CITY STD. S29, S30 FOR REAR YARD TRENCH AND PIPE DETAIL ONLY

LEGEND

PROPOSED ELEVATION — 103.45
EXISTING ELEVATION — 102.73
FUTURE ELEVATION — [93.900]
PROPOSED SWALE GRADE
HIGH POINT — 102.18
STREET CATCHBASIN
STREET CATCHBASIN WITH CLOSED LID
CATCHBASIN MANHOLE
TEE CATCHBASIN
ELBOW CATCHBASIN
HYDRANT, VALVE & VB
VALVE & VC
VALVE & VB
BUILDING ENVELOPE
TOP OF FOUNDATION (TOF) — 94.70
FINISHED FLOOR ELEVATION (FFE)
UNDERSIDE OF FOOTING ELEVATION (USF) — 92.60
FRONT/REAR ENVELOPE ELEVATION
WALKOUT UNITS — W.O
SLAB ON GRADE — SOG
HYDRO SWITCHGEAR
HYDRO TRANSFORMER
STREET LIGHT STANDARD
TACTILE WALKING SURFACE INDICATOR (AS PER CITY OF OTTAWA STD. SC6)
100Yr W.L.
OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
EMERGENCY OVERLAND FLOW DIRECTION
RETAINING WALL AND ELEVATIONS — T/W=103.10, B/W=102.44
CHAINLINK FENCE (1.5m UNLESS OTHERWISE NOTED)
NOISE BARRIER (2.5m UNLESS OTHERWISE NOTED)
DECORATIVE FENCE (SEE LANDSCAPE DWGS FOR DETAIL)
CONSTRUCTION FENCE
PROPERTY BOUNDARY
3:1 TERRACING MAXIMUM SLOPE
PONDING AREA WITH SPILLWAY ELEVATION (MAXIMUM 0.30m)
250Ø PVC PERFORATED PIPE (REFER TO CITY STD S29 FOR REAR YARD TRENCH AND PIPE DETAILS ONLY) (SUBDRAIN APPLIED FOR SLOPE LESS THAN 1.5%)
EXISTING SANITARY MAINTENANCE HOLE
EXISTING STORM MAINTENANCE HOLE
FIREWALL

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED. PROJECT No. 20-10-178-00, SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022. TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED. PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES, PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No.	BY	DATE	DESCRIPTION
3	W.L.	22-08-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-08-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER
s.21
PROVINCE OF ONTARIO

© DSEL

GRADING PLAN

CAIVAN (MER BLEUE) INC.

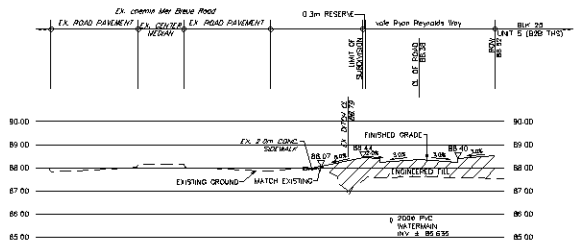
CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

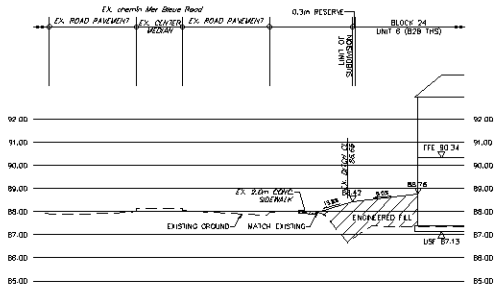
DRAWN BY: A.K./V.W.	CHECKED BY: W.L.	SHEET NO
DESIGNED BY: W.L.	CHECKED BY: C.M.	16
SCALE: 1:500	DATE: DECEMBER 2021	

CITY PLAN No. 18616

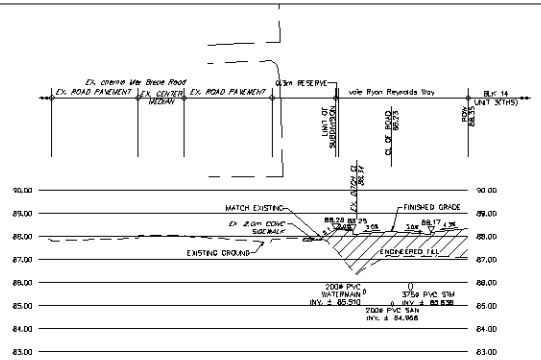
CITY FILE No. D07-16-21-0001



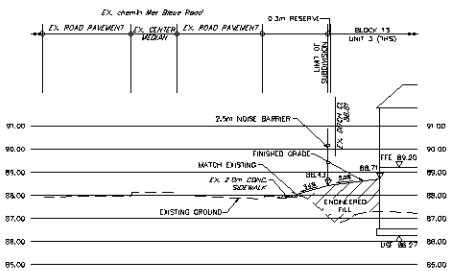
SECTION 1–1
SCALE HOR. 1:250
VER. 1:100



SECTION 2–2
SCALE HOR. 1:250
VER. 1:100



SECTION 3–3
SCALE HOR. 1:250
VER. 1:100



SECTION 4–4
SCALE HOR. 1:250
VER. 1:100

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-175-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-15, SURVEY DATED SEPTEMBER, 2020.

LEGAL INFORMATION
M-PLAN PROVIDED BY J.D. BARNES., PROJECT No.
20-10-175-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE
LOCAL JOB BENCHMARK REFERRED TO THE CANADA GEODETIC DATUM (NAD 83) NO. 18048-10) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG INNAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.28m ON THE TOP OF SPINDLE
ELEVATD = 89.28m.

No.	BY	DATE	DESCRIPTION
3	W.L.	22-06-29	3rd SUBMISSION (BY DSEL)
2	W.L.	22-06-23	2nd SUBMISSION (BY DSEL)
1	W.L.	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER s.21 PROVINCE OF ONTARIO 22-06-29

© DSEL

CROSS SECTIONS

CAIVAN (MER BLEUE) INC.

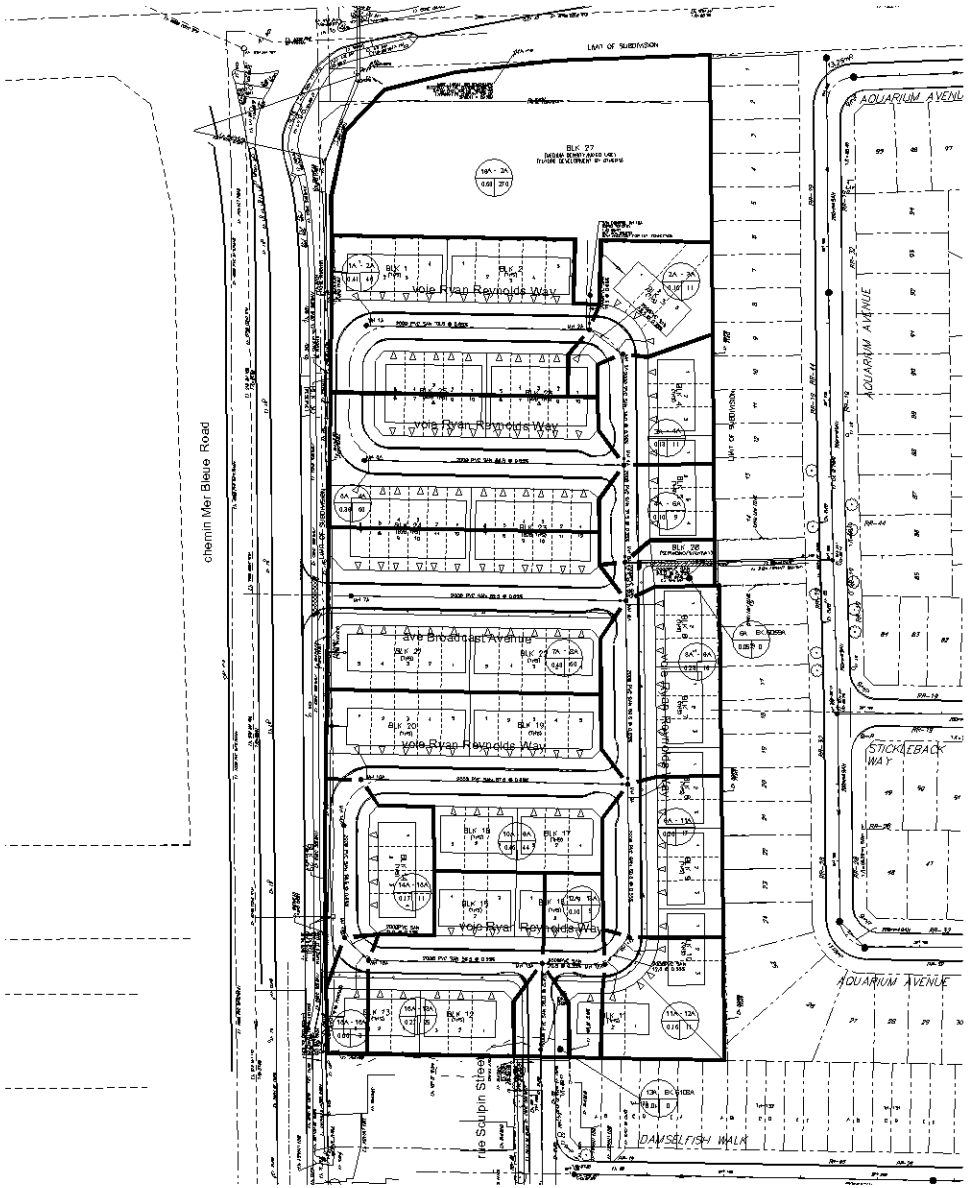
CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

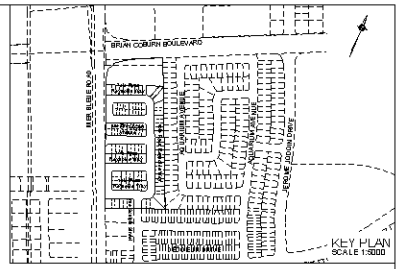
DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: A.K./W.L.		CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.		CHECKED BY: C.M.	17
SCALE: 1:500		DATE: DECEMBER 2021	

CITY FILE No. 007-16-21-0001 CITY PLAN No. 18616

000514





LEGEND

SANITARY DRAINAGE BOUNDARY

SANITARY SUB-DRAINAGE BOUNDARY

SANITARY DRAINAGE BOUNDARY (OTHER PHASES)

UPSTREAM MH TO DOWNSTREAM MH — 43A - 44A

AREA IN HECTARES — 0.78 | 61

POPULATION

UPSTREAM MH TO DOWNSTREAM MH — 43A-44A

AREA IN OTHER PHASES IN HECTARES — 0.78 | 69

POPULATION

EXTERNAL AREA IN HECTARES — A= 53.63

EXTERNAL POPULATION — 107

DENSITY (PERSONS/HECTARE) — P/A=5.20

EXTERNAL LAND USE — RESIDENTIAL

MAINTENANCE HOLE — MH39A

CAP

EXISTING SANITARY MAINTENANCE HOLE

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES, PROJECT No. 20-10-178-00A RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE GEODETIC DATUM (ADV JOB NO. 18048-19) PROVIDED AT THE EASTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATED @ = 89.260m

No	BY	DATE	DESCRIPTION
3	WL	22-06-29	3rd SUBMISSION (BY DSEL)
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-06	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER — s.21 — PROVINCE OF ONTARIO

SANITARY DRAINAGE PLAN © DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

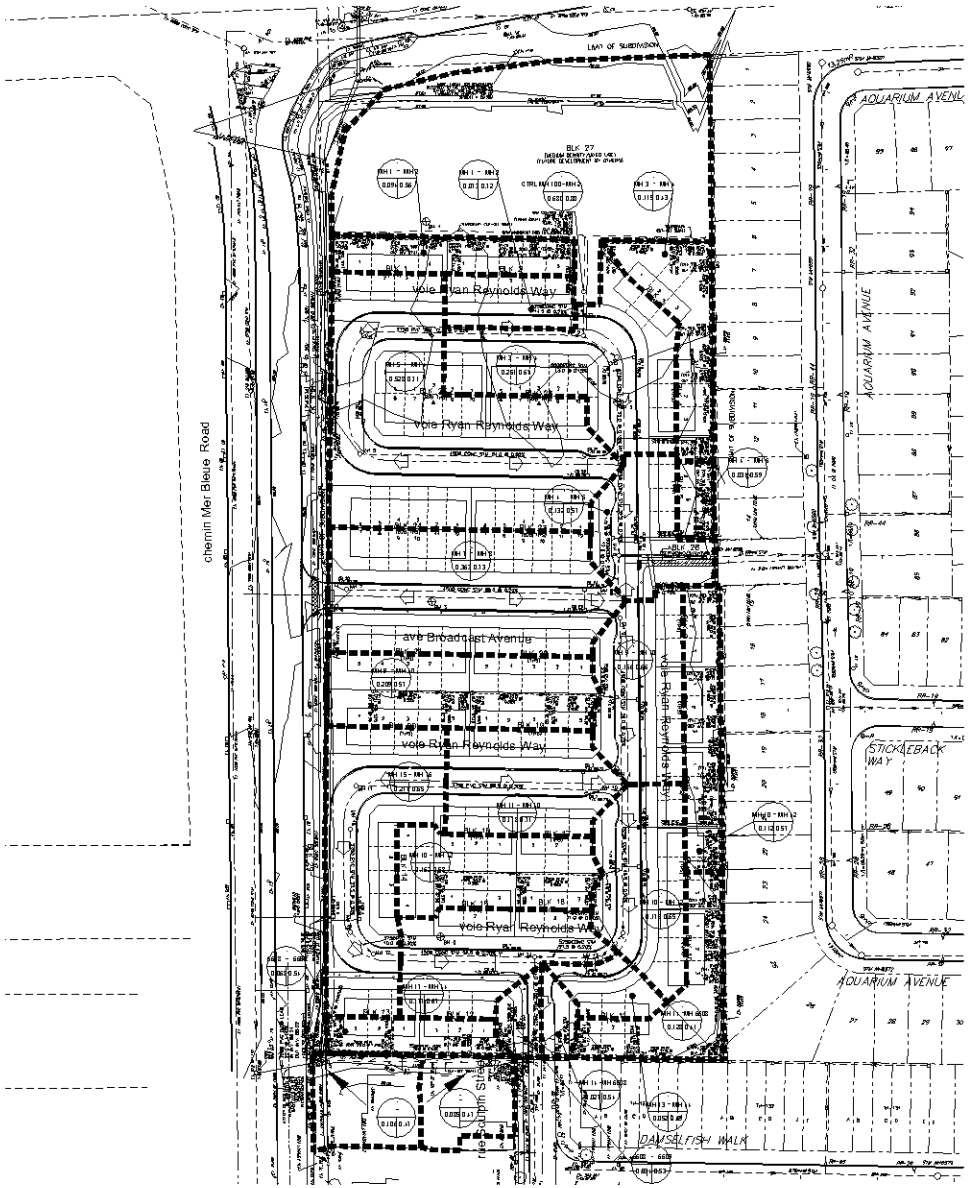
DSEL

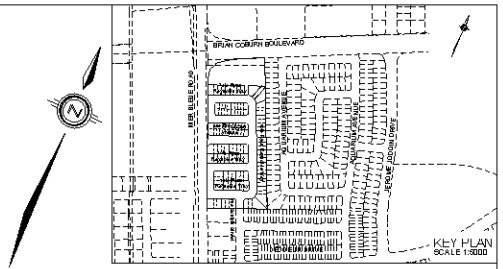
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.dsel.ca

DRAWN BY: A.K./V.R.	CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: C.M.	18
SCALE:	DATE: DECEMBER 2021	

CITY FILE No. D07-16-21-0001 CITY PLAN No. 18616

000515





LEGEND

STORM DRAINAGE BOUNDARY
SUB-DRAINAGE BOUNDARY
STORM DRAINAGE BOUNDARY (OTHER PHASES)
STORM FREQUENCY
UPSTREAM MH TO DOWNSTREAM MH
AREA IN HECTARES
RUNOFF COEFFICIENT
EXTERNAL 2.78AC = 14.40
EXTERNAL TIME OF CONCENTRATION
EXTERNAL BLENDED RUNOFF COEFFICIENT
EXTERNAL STORM FREQUENCY
UPSTREAM MH TO DOWNSTREAM MH
AREA IN OTHER PHASES IN HECTARES
RUNOFF COEFFICIENT
STREET CATCHBASIN & LEAD
STREET CATCHBASIN WITH CLOSED LID & LEAD MAINTENANCE HOLE
CURB INLET CATCHBASIN & LEAD
CATCHBASIN/ MAINTENANCE HOLE
INTERCONNECTED CATCH BASIN & LEADS
CAP
OVERLAND FLOW DIRECTION
EXTERNAL OVERLAND FLOW DIRECTION
EXISTING STORM MAINTENANCE HOLE

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES, PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERED TO THE CANADA GEODETIC DATUM (ADV JOB NO. 18048-19) OBTAINED AT THE EASTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 99.26m ON THE TOP OF SPINDLE ELEVATED = 99.260m

No	BY	DATE	DESCRIPTION
3	WL	22-06-29	3rd SUBMISSION (BY DSEL)
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-06	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

PROFESSIONAL ENGINEER PROVINCE OF ONTARIO S.21 22-06-29

STORM DRAINAGE PLAN

DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

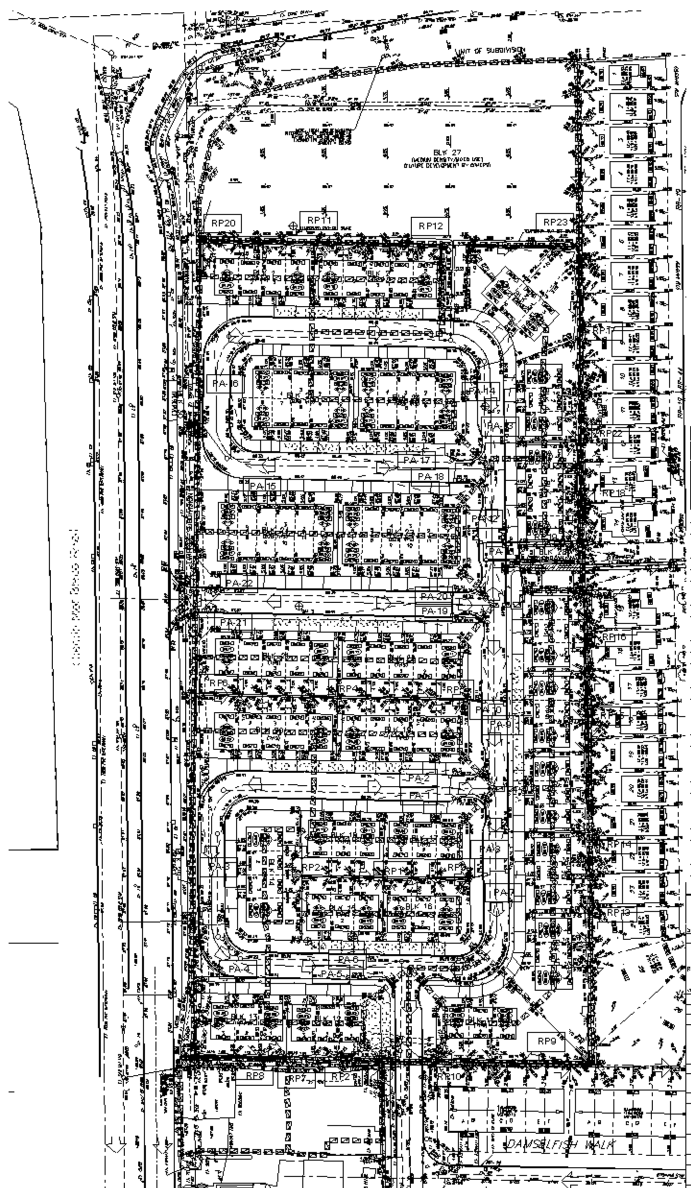
DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel: (613) 836-0856
Fax: (613) 836-7183
www.dsel.ca

DRAWN BY: A.K./V.R.	CHECKED BY: W.L.	SHEET NO.
DESIGNED BY: W.L.	CHECKED BY: C.M.	19
SCALE: 1:500	DATE: DECEMBER 2021	

CITY FILE No. D07-16-21-0001 CITY PLAN No. 18616

000516



100 YR/STATIC REAR YARD PONDING AREA TABLE

NOTE: PONDING VOLUMES FOR THE REAR YARDS ARE NOT TAKEN INTO ACCOUNT FOR STORAGE CAPACITY

AREA NUMBER	MAXIMUM STATIC PONDING DEPTH (m)	MAXIMUM STATIC PONDING ELEVATION (m)
RPA-1	0.21	88.45
RPA-2	0.19	88.48
RPA-3	0.11	88.43
RPA-4	0.21	88.60
RPA-5	0.18	88.35
RPA-6	0.19	88.64
RPA-7	0.14	88.18
RPA-8	0.25	88.19
RPA-9	0.25	88.19
RPA-10	0.19	88.13
RPA-11	0.23	88.63
RPA-12	0.22	88.72
RPA-13	0.13	88.25
RPA-14	0.15	88.34
RPA-15	0.19	88.38
RPA-16	0.18	88.37
RPA-17	0.20	88.50
RPA-18	0.08	88.45
RPA-19	0.02	88.30
RPA-20	0.15	88.59
RPA-21	0.16	88.13
RPA-22	0.17	88.47
RPA-23	0.24	88.57

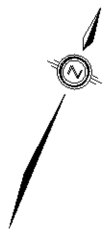
100 YR/STATIC STREET PONDING AREA TABLE

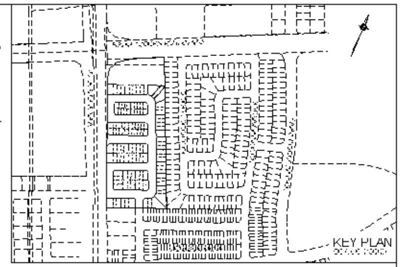
NOTE: PONDING VOLUMES FOR THE REAR YARDS ARE NOT TAKEN INTO ACCOUNT FOR STORAGE CAPACITY

CB Number	AREA NUMBER	MAXIMUM STATIC PONDING DEPTH (m)	MAXIMUM STATIC PONDING ELEVATION (m)	MAXIMUM STATIC PONDING VOLUME (m³)	MAXIMUM STATIC PONDING AREA (m²)	MAXIMUM 100YR+20% PONDING DEPTH (m)	MAXIMUM 100YR+20% PONDING ELEVATION (m)
CB 2	PA-1	0.12	88.35	3.2	85.59	0.21	88.44
CB 3	PA-2	0.12	88.35	3.8	98.56	0.22	88.44
CICB 4	PA-3	0.20	88.24	6.9	187.77	0.24	88.28
CICB 5	PA-4	0.20	88.24	15.5	250.79	0.24	88.28
CB 6	PA-5	0.07	88.14	0.4	15.68	0.12	88.19
CB 7	PA-6	0.12	88.20	4.0	111.97	[illegible]	[illegible]
CB 10	PA-7	0.16	88.30	20.1	169.14	0.24	88.38
CB 9	PA-8	0.16	88.30	5.8	121.75	0.24	88.38
CB 12	PA-9	0.12	88.37	3.0	84.17	0.20	88.45
CB 11	PA-10	0.1	88.37	2.5	69.77	0.19	88.45
CB 14	PA-11	0.12	88.49	6.1	159.01	0.23	88.55
CB 15	PA-12	0.17	88.49	4.8	56.01	0.23	88.55
CB 16	PA-13	0.24	88.49	28.8	401.04	0.30	88.55
CB 17	PA-14	0.23	88.49	6.9	245.65	0.29	88.55
CICB 19	PA-15	0.23	88.42	15.6	285.77	0.30	88.49
CICB 20	PA-16	0.23	88.42	14.4	229.23	0.30	88.49
CB 21	PA-17	0.19	88.49	10.4	183.51	0.25	88.55
CB 22	PA-18	0.21	88.49	15.6	249.01	0.27	88.55
CB 23	PA-19	0.17	88.49	9.1	179.06	0.23	88.55
CB 24	PA-20	0.18	88.49	10.0	185.02	0.24	88.55
CB 25	PA-21	0.12	87.87	1.7	36.02	0.06	87.82
CB 26	PA-22	0.12	87.87	1.7	48.68	0.06	87.82
CB 1	NO POND	0.00					
CB 8	NO POND	0.00					
CB 13	NO POND	0.00					
CB 18	PA-23	0.12	88.49			0.18	88.55
CB 27	NO POND	0.00					
CB 28	NO POND	0.00					
CB 29	NO POND	0.00					
CICB 101	NO POND	0.00					
Ex. DICB	NO POND	0.00					

INLET CONTROL DEVICE (ICD) DATA (Circular Orifice Plate)

STREET NAME	CATCHBASIN ID	OUTLET PIPE DIA. (mm)	OUTLET PIPE TYPE	OUTLET PIPE LENGTH (m)	OUTLET PIPE AV. DEPTH (m)	T/G OF GRATE	GRATING COVER	INVERT INLET	INVERT OUTLET	ICD DIA (mm)	PONDING ID	STATIC PONDING DEPTH (m)	RELEASE RATE AT 2-YEAR EVENT (L/S)	RELEASE RATE AT 100-YEAR EVENT (L/S)	DRAWDOWN 5-YEAR EVENT (HH:MM)	DRAWDOWN 100-YEAR EVENT (HH:MM)
[illegible] Broadfoot Avenue	CB 23	200	PVC	4.50	1.78	88.52	S19 PERFORATED	-	86.97	83	PA-19	0.17	14	16	00:52	01:20
	CB 24	200	PVC	1.06	1.86	88.51	S19 PERFORATED	-	86.98	83	PA-20	0.18	14	18	00:52	01:23
	CB 25	200	PVC	0.97	1.78	87.75	S19 PERFORATED	-	86.07	127	PA-21	0.12	14	37	00:50	01:19
	CB 26	200	PVC	2.70	1.78	87.75	S19 PERFORATED	-	86.07	127	PA-22	0.12	14	37	00:50	01:19
[illegible] SCULPIN STREET	CB 1	200	PVC	8.06	1.74	87.90	S19 PERFORATED	86.21	86.15	152	NO POND	0	8	49	00:52	00:58
	CB 27	200	PVC	6.47	1.74	87.90	S19 PERFORATED	86.21	86.15	152	NO POND	0	9	55	00:52	00:58
[illegible] Republic Way	CB 2	200	PVC	0.89	1.86	88.23	S19 PERFORATED	-	86.85	83	PA-1	0.12	13	13	00:40	01:20
	CB 3	200	PVC	5.24	1.86	88.22	S19 PERFORATED	-	86.87	83	PA-2	0.13	13	13	00:40	01:20
	CICB 4	200	PVC	1.05	1.78	88.07	S22 & S23	-	86.55	83	PA-3	0.2	17	19	01:05	02:41
	CICB 5	200	PVC	5.25	1.86	88.04	S22 & S23	-	86.55	94	PA-4	0.2	19	27	01:05	02:41
	CB 6	200	PVC	5.01	1.86	88.07	S19 PERFORATED		86.69	127	PA-5	0.07	14	40	00:45	01:17
	CB 7	200	PVC	1.00	1.78	88.09	S19 PERFORATED	-	86.70	127	PA-6	0.12	14	40	00:45	01:17
	CB 8	200	PVC	5.01	1.86	88.28	S19 PERFORATED		86.85	102	NO POND	0	8	8	00:59	00:59
	CB 9	200	PVC	1.00	1.77	88.14	S19 PERFORATED	85.72	86.37	102	PA-8	0.16	26	28	00:27	01:12
	CB 10	200	PVC	5.00	1.86	88.14	S19 PERFORATED	-	86.75	94	PA-7	0.16	14	27	00:27	01:12
	CB 11	200	PVC	1.07	1.74	88.25	S19 PERFORATED	85.59	86.52	106	PA-10	0.11	29	31	00:42	01:18
	CB 12	200	PVC	5.00	1.78	88.25	S19 PERFORATED	-	86.97	83	PA-9	0.12	12	16	00:42	01:18
	CB 13	200	PVC	5.00	1.81	88.26	S19 SOLID ALTERNATE	85.50	86.45	152	NO POND	0	12	47	-	-
	CB 14	200	PVC	5.23	1.86	88.32	S19 PERFORATED		86.94	83	PA-11	0.17	7	18	00:55	00:55
	CB 15	200	PVC	1.30	1.78	88.32	S19 PERFORATED	-	86.94	83	PA-12	0.17	7	18	00:55	00:55
	CB 16	200	PVC	5.33	1.74	88.25	S19 PERFORATED	85.55	86.51	83	PA-13	0.24	18	10	01:09	01:50
	CB 17	200	PVC	1.54	1.86	88.25	S19 PERFORATED		86.88	94	PA-14	0.23	28	34	01:09	01:50
	CB 18	200	PVC	5.25	1.64	88.37	S19 PERFORATED	85.58	86.53	94	PA-15	0.12	12	28	01:02	01:39
	CICB 19	200	PVC	14.55	1.86	88.19	S22 & S23	-	86.81	102	PA-15	0.23	26	28	02:15	02:44
	CICB 20	200	PVC	10.05	1.78	88.19	S22 & S23	-	86.81	94	PA-16	0.23	22	27	02:15	02:44
	CB 21	200	PVC	0.50	1.78	88.50	S19 PERFORATED	-	86.92	83	PA-17	0.19	15	16	00:57	01:20
	CB 22	200	PVC	5.25	1.86	88.28	S19 PERFORATED		86.90	83	PA-18	0.21	15	13	00:54	01:28
	CB 28	200	PVC	5.75	2.07	88.41	S19 SOLID ALTERNATE	85.59	86.34	83	NO POND	0	7	19		
	CB 29	200	PVC	5.73	1.74	88.32	S19 SOLID ALTERNATE	85.53	86.59	83	NO POND	0	4	12	-	-
EXISTING	CICB	200	PVC	5.85	1.09	87.54	S19 PERFORATED	-	86.15	94	NO POND	0	-	-	-	-
	CICB 101	200	PVC	22.00	1.09	87.53	S19 PERFORATED	-	86.27	102	NO POND	0	-	-	-	-





LEGEND

TOP OF FOUNDATION ELEVATION	
FINISHED FLOOR ELEVATION	
UNDERSIDE OF FOOTING ELEVATION	
PONDING AREA	
PONDING AREA ID	PA-1
PROPOSED ELEVATION / EXISTING ELEVATION	82.52 / 82.52
TOP OF GRATE ELEVATION	T/G 92.55
MAJOR OVERLAND FLOW DIRECTION	
EMERGENCY OVERLAND FLOW DIRECTION	
STORM DRAINAGE AREA	

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED. PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED. PROJECT No. 18048-19. SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.26m ON THE TOP OF SPINDLE ELEVATION = 89.260m

No	BY	DATE	DESCRIPTION
3	WL	22-06-29	3rd SUBMISSION (BY DSEL)
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

STATIC PONDING & 100 YEAR + 20% PONDING PLAN

© DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

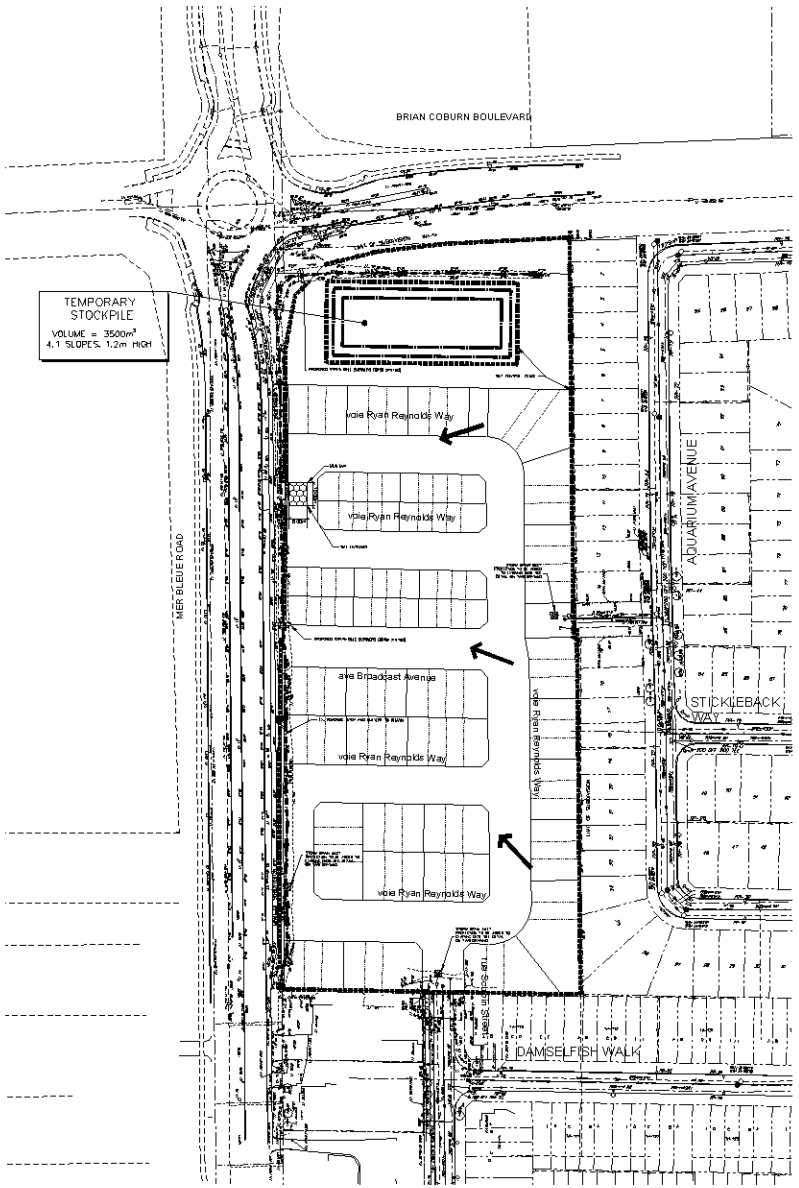
DSEL

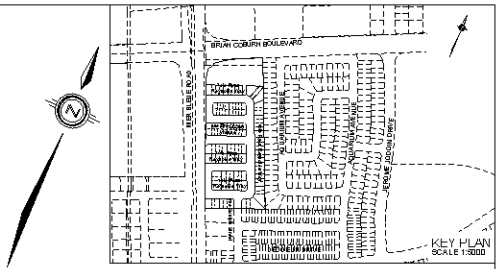
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

DRAWN BY: A.K./V.M.	CHECKED BY: WL	SHEET NO.
DESIGNED BY: WL	CHECKED BY: C.M.	20
SCALE:	DATE: DECEMBER 2021	

CITY PLAN No. 18616

CITY FILE No. D07-16-21-0001





MONITORING OF SEDIMENT AND EROSION CONTROLS

MONITORING AND REPORTING TO BE COMPLETED IN ACCORDANCE WITH THE MINISTRY OF THE ENVIRONMENT, CONSERVATION, AND PARKS (MECP) AND RIDEAU VALLEY CONSERVATION AUTHORITY(RVCA) REGULATIONS.
MAINTENANCE PROGRAM
ALL DAMAGED ESC MEASURES SHOULD BE REPAIRED AND/OR REPLACEMENT WITHIN 48 HOURS OF THE INSPECTION.
THE ENVIRONMENTAL MONITOR IS REQUIRED TO SUBMIT UPDATES TO THE TOWN/ REGION/ CONSERVATION AUTHORITY BY EMAIL IN A TIMELY MANNER.
SEDIMENT SHOULD BE REMOVED FROM THE SEDIMENT CONTROL FENCING ONCE SEDIMENT HAS ACCUMULATED TO A LEVEL OF ONE-THIRD THE HEIGHT OF FENCING OR TO A HEIGHT OF 30 cm, ANY AMOUNT OF ACCUMULATED SEDIMENT SHOULD BE REMOVED PRIOR TO THE REMOVAL OF THE CONTROL MEASURES

SEQUENCE OF ACTIVITIES

THE EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE;
- INSTALLATION OF THE SEDIMENT CONTROL FENCING WHERE INDICATED.
- REMOVAL OF SITE VEGETATION IN ACCORDANCE WITH ALL APPLICABLE BY-LAWS.
- REGULAR MONITORING OF THE SEDIMENT CONTROL FENCES BY THE CONTRACTOR TO VERIFY THAT THE FENCES ARE FUNCTIONING AS INTENDED.
- REMOVAL OF THE EROSION AND SEDIMENT CONTROL DEVICES ONCE THE SITE HAS BEEN STABILIZED.

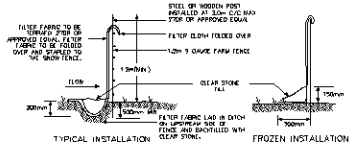
SPILLS CONTROL NOTES

ALL CONSTRUCTION EQUIPMENT SHALL BE REFUELED, MAINTAINED AND STORED NO LESS THAN 30 METERS FROM THE WATERCOURSES, STREAMS, CREEKS, WOODLOTS AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
THE CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF A POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL,
1. IMMEDIATELY NOTIFY THE APPROPRIATE FEDERAL, PROVINCIAL AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, ETC.
2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES AS THEY DEEM APPROPRIATE TO MITIGATE AGAINST THE ANY ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
3. THE CONTRACT SHALL RESTORE THE AFFECTED AREA TO ORIGINAL CONDITION OR BETTER, ALL TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

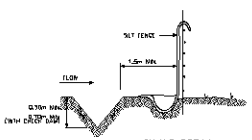
THE SILTATION CONTROL PLAN IS INTENDED TO ASSIST THE CONTRACTOR IN THE LAYOUT AND CONSTRUCTION OF THE SILTATION CONTROL FEATURES ONLY. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION OF SITE SERVICES.

LEGEND

PROPOSED SILT FENCE
PHASE LIMIT
SWALE
MAJOR OVERLAND FLOW DIRECTION
EXISTING CONTOUR ELEVATION 101.00
PROPOSED STRAW BALE BARRIER



SILT CONTROL FENCE
SCALE: N.T.S



SWALE DETAIL
SCALE N.T.S

TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION
M-PLAN PROVIDED BY J.D. BARNES, PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE
LOCAL JOB BENCHMARK REFERRED TO THE CANADA GEODETIC DATUM (ADV JOB NO. 18048-19) OBTAINED AT THE EASTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 99.26m ON THE TOP OF SPINDLE ELEVATED = 99.260m

No	BY	DATE	DESCRIPTION
3	WL	22-06-29	3rd SUBMISSION (BY DSEL)
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-06	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER s.21 77-06-29 PROVINCE OF ONTARIO

EROSION AND SEDIMENT CONTROL PLAN STAGE 1

DSEL

CAIVAN (MER BLEUE) INC.

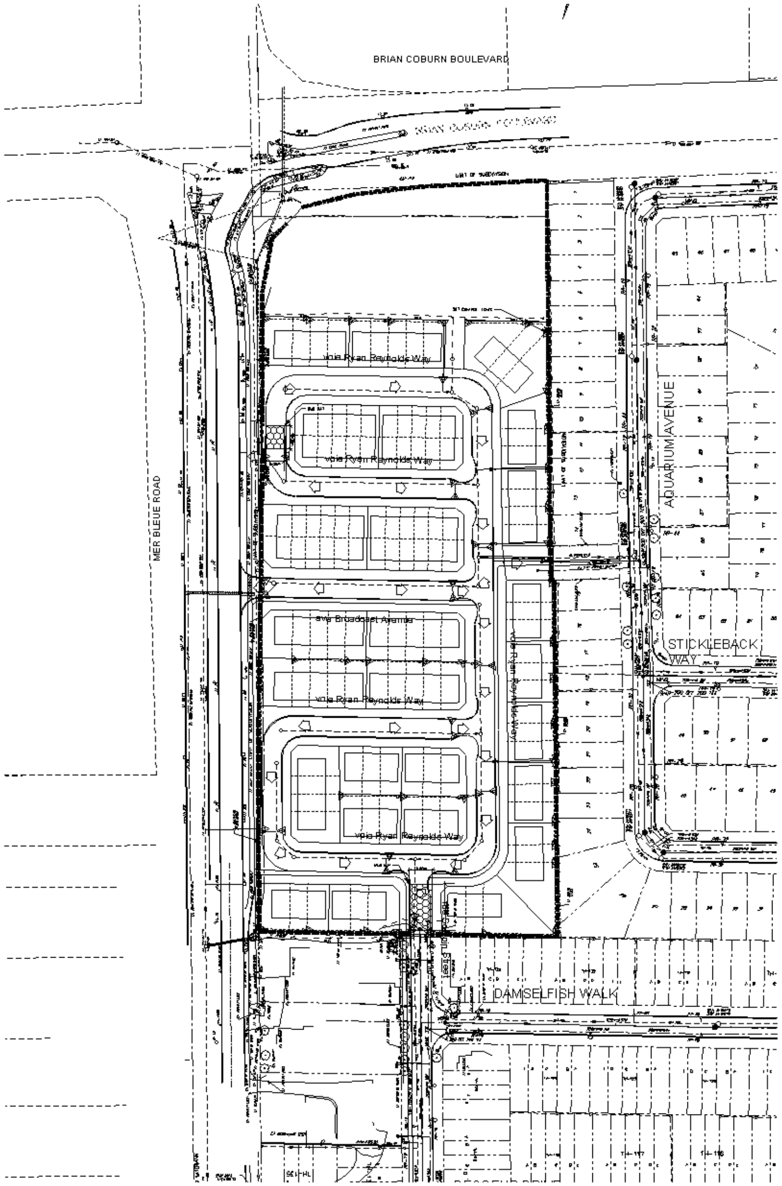
CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

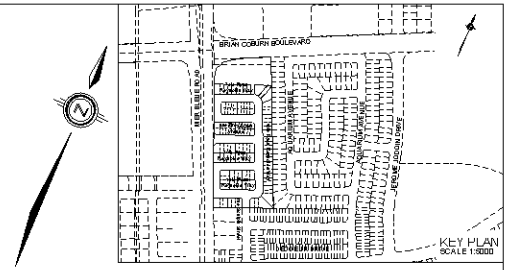
DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel: (613) 836-0856
Fax: (613) 836-7183
www.dsel.ca

DRAWN BY: A.K./V.R.	CHECKED BY: W.L.	SHEET NO.	
DESIGNED BY: W.L.	CHECKED BY: C.M.	21	
SCALE: 1:1000	DATE: DECEMBER 2021		

CITY FILE No. D07-16-21-0001 CITY PLAN No. 18616

000518





THE SILTATION CONTROL PLAN IS INTENDED TO ASSIST THE CONTRACTOR IN THE LAYOUT AND CONSTRUCTION OF THE SILTATION CONTROL FEATURES ONLY. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION OF SITE SERVICES.

MONITORING OF SEDIMENT AND EROSION CONTROLS

MONITORING AND REPORTING TO BE COMPLETED IN ACCORDANCE WITH THE MINISTRY OF THE ENVIRONMENT, CONSERVATION, AND PARKS (MECP) AND RIDEAU VALLEY CONSERVATION AUTHORITY(RVCA) REGULATIONS.

MAINTENANCE PROGRAM

ALL DAMAGED ESC MEASURES SHOULD BE REPAIRED AND/OR REPLACEMENT WITHIN 48 HOURS OF THE INSPECTION.
THE ENVIRONMENTAL MONITOR IS REQUIRED TO SUBMIT UPDATES TO THE TOWN/ REGION/ CONSERVATION AUTHORITY BY EMAIL IN A TIMELY MANNER.
SEDIMENT SHOULD BE REMOVED FROM THE SEDIMENT CONTROL FENCING ONCE SEDIMENT HAS ACCUMULATED TO A LEVEL OF ONE-THIRD THE HEIGHT OF FENCING OR TO A HEIGHT OF 30 cm. ANY AMOUNT OF ACCUMULATED SEDIMENT SHOULD BE REMOVED PRIOR TO THE REMOVAL OF THE CONTROL MEASURES.

EROSION AND SEDIMENT CONTROL NOTES

PRIOR TO TOPSOIL STRIPPING, EARTHWORKS, OR UNDERGROUND CONSTRUCTION, EROSION AND SEDIMENT CONTROLS SHALL BE IMPLEMENTED TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION

SEDIMENT CONTROL FENCE SHALL BE CLEANED AND MAINTAINED IN GOOD REPAIR BY CONTRACTOR.

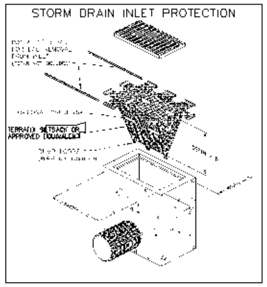
SEDIMENT CONTROL FENCE TO REMAIN IN PLACE UNTIL THE WORKING AREA HAS BEEN STABILIZED AND REVEGETATED.

ACCUMULATED SEDIMENT TO BE REMOVED OFF SITE PRIOR TO THE REMOVAL OF SEDIMENT CONTROL FENCE.

EROSION AND SEDIMENT CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA SITE INSPECTOR OR CONSERVATION AUTHORITY PERSONNEL

CONTRACTOR MUST USE BEST MANAGEMENT PRACTICES (BMPS) FOR EROSION AND SEDIMENT CONTROL.

STORM DRAIN INLET PROTECTION



LEGEND

PROPOSED SILT FENCE
PROPOSED SNOW FENCE
PROPOSED ROCK FLOW CHECK DAM
PROPOSED STRAW BALE BARRIER
PROPOSED STRAW BALE BARRIER WITH FILTER CLOTH
STORM DRAIN INLET PROTECTION
PROPOSED RIP RAP TREATMENT
DITCH AND CULVERT — 600Ø CSP
MAJOR OVERLAND FLOW DIRECTION

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED.
PROJECT No. 20-10-178-00 SURVEY DATED DEC 23, 2020 AND MARCH 24, 2022
TOPOGRAPHIC INFORMATION PROVIDED BY ANNIS, O'SULLIVAN, VOLLEBEKK LIMITED.
PROJECT No. 18048-19, SURVEY DATED SEPTEMBER, 2020

LEGAL INFORMATION

M-PLAN PROVIDED BY J.D. BARNES., PROJECT No. 20-10-178-00, RECEIVED ON MARCH 15, 2022.

NOT FOR CONSTRUCTION

ELEVATION NOTE

LOCAL JOB BENCHMARK REFERRED TO THE CGVD28 GEODETIC DATUM (AOV JOB NO. 18048-19) PROVIDED AT THE EXISTING FIRE HYDRANT ALONG BRIAN COBURN BOULEVARD WITH A GEODETIC ELEVATION OF 89.28m ON THE TOP OF SPINDLE ELEVATION = 89.280m

No	BY	DATE	DESCRIPTION
3	WL	22-06-29	3rd SUBMISSION (BY DSEL)
2	WL	22-06-23	2nd SUBMISSION (BY DSEL)
1	WL	22-05-05	1st SUBMISSION (BY DSEL)

CITY OF OTTAWA

PROJECT No. 20-1214

LICENSED PROFESSIONAL ENGINEER [redacted] s.21 77-06-79 PROVINCE OF ONTARIO

EROSION AND SEDIMENT CONTROL PLAN STAGE 2

© DSEL

CAIVAN (MER BLEUE) INC.

CASSETTE SUBDIVISION (2275 MER-BLEUE ROAD)

DSEL

120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

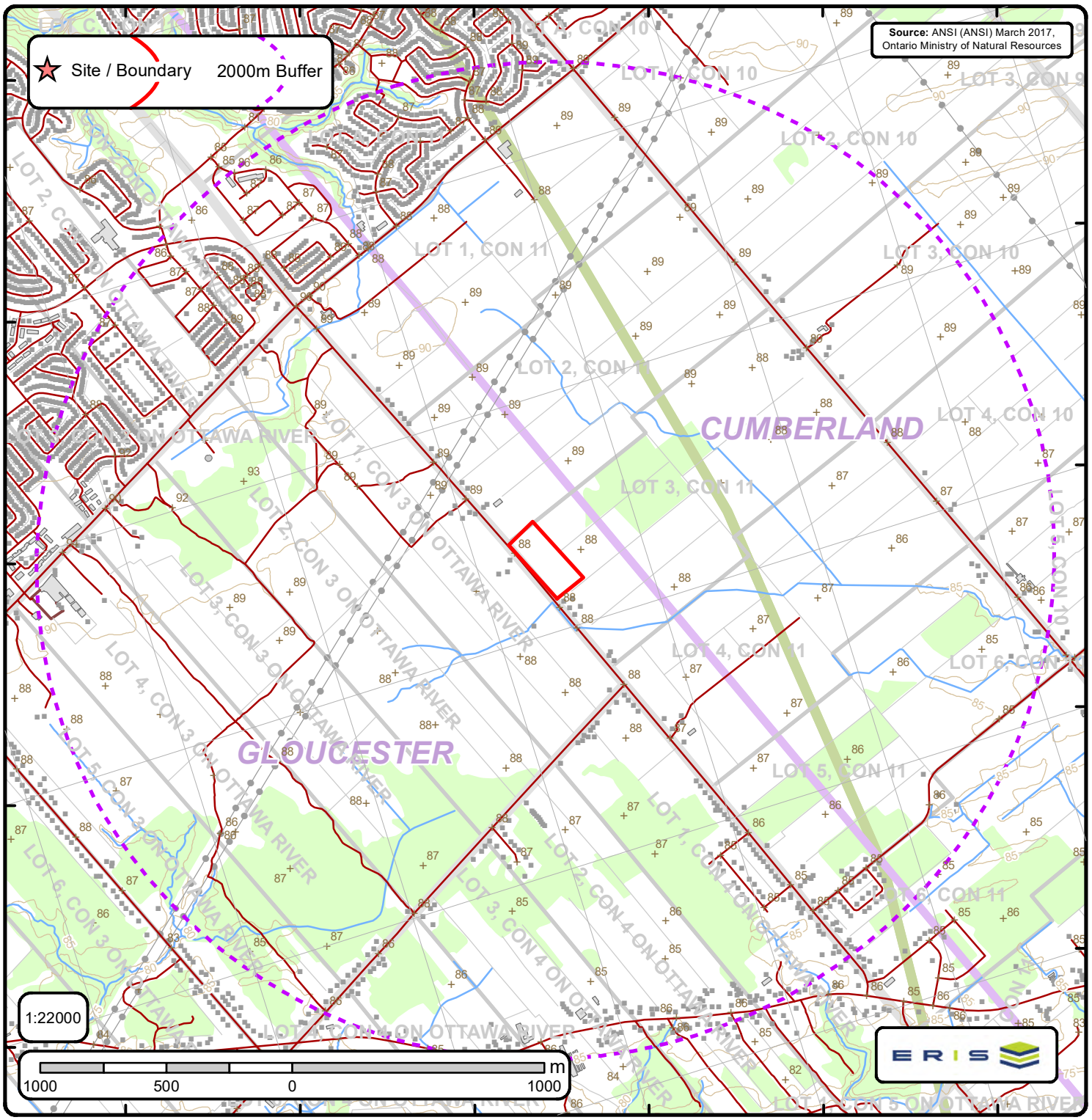
DRAWN BY: A.K./V.W.	CHECKED BY: WL	SHEET NO.
DESIGNED BY: WL	CHECKED BY: C.M.	22
SCALE: 1:500	DATE: DECEMBER 2021	

CITY PLAN No. 18616

CITY FILE No. D07-16-21-0001

APPENDIX F

Maps



Area of Natural & Scientific Interest (ANSI) Order No. 23042400186

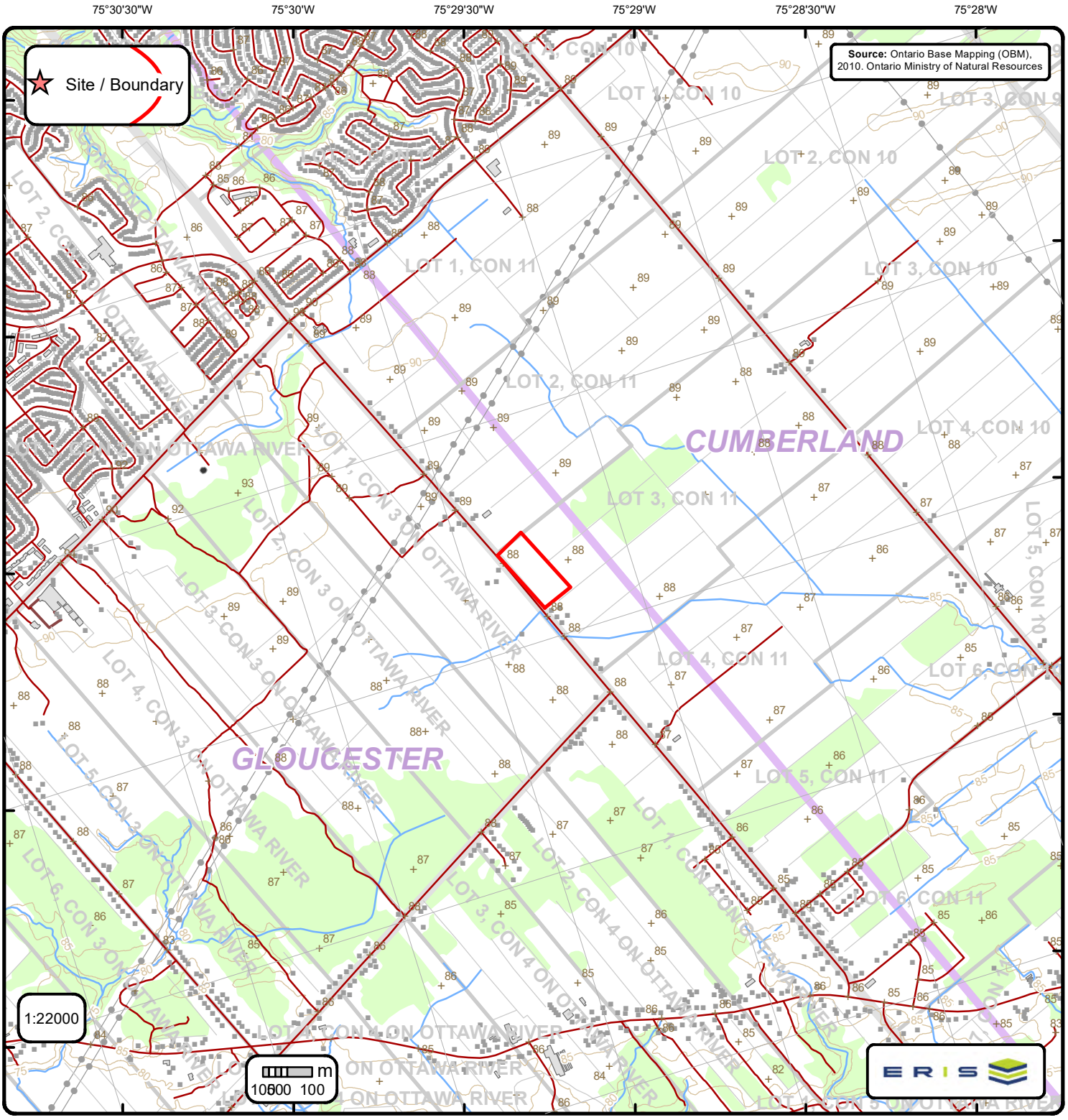
Spot Height	Transportation Structure	Contour Line	Wooded Area
Building Point	Utility Line	Pit or Quarry	Conservation Authority
Towers	Water Structure	Waterbody	Conservation Area
Utility Site Point	Drainage Line Feature	Wetlands	Municipal Park
Misc. Line	River or Stream	Concession	Provincial Park
Railroads	Airports	Lots	National Park
Roads	Tanks	Municipalitiy	Nature Reserve
Trail	Building to Scale	Land Ownership	ANSI Area

ANSI Report

ANSI Units Found within 2000 m of
2275 Mer-Bleue Rd

Order No.
23042400186

No ANSI units found within search area.



Ontario Base Mapping (OBM) Data

Order No. 23042400186

Spot Height (metre)	Transportation Structure	Contour Line	Wooded Area
Building Point	Utility Line	Pit or Quarry	Conservation Authority
Towers	Water Structure	Waterbody	Conservation Area
Utility Site Point	Drainage Line Feature	Wetlands	Municipal Park
Misc. Line	River or Stream	Concession	Provincial Park
Railroads	Airports	Lots	National Park
Roads	Tanks	Municipalitiy	Nature Reserve
Trail	Building to Scale	Land Ownership	