



Secret Garden Subdivision

Fisheries Act Review

Project Location:

Between Tourangeau Road and Allyson Avenue,
Windsor, ON

Prepared for:

Olivia Construction Homes Inc.
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Prepared by:

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MTE File No.: 50191-101





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1.0 INTRODUCTION

1.1 Project Overview

MTE was retained by Haddad Morgan & Associates Ltd. to complete a fish and fish habitat self assessment to maintain compliance with the federal *Fisheries Act*. MTE understands that the development located off Tourangeau Road in Windsor, Ontario, known as the Secret Garden Residential Subdivision, requires the installation of a storm sewer system with an outlet into the adjacent municipal drain (Pilette Drain No. 1) at the southwest corner of the Subject Lands (Figure 1). The storm sewer system has been designed to be surrounded by riprap to disperse the flow as it enters the drain. The review completed included an aquatic habitat assessment in the drain where the outlet is proposed.

Potential impacts of the storm sewer system outlet were assessed to determine the likelihood of causing the death of fish and/or a harmful alteration, disruption, or destruction (HADD) of fish habitat, which is prohibited under subsection 34.4(1) and subsection 35(1) of the *Fisheries Act* (1985) which states that:

34.4 (1) No person shall carry on any work, undertaking or activity, other than fishing, that results in the death of fish.

35. (1) No person shall carry on any work, undertaking or activity that results in harmful alteration, disruption, or destruction of fish habitat.

Through a detailed aquatic effects assessment of construction activities, appropriate mitigation and avoidance measures are revealed to minimize or avoid residual impacts to fish and fish habitat. Where residual impacts are determined likely to cause the death of fish or a HADD of fish habitat, a Request for Review Form will be recommended for submission to Fisheries and Oceans Canada (DFO) for further review to determine the need for a formal authorization under the *Fisheries Act*.

1.2 Description and Location of Work

The residential development known as the Secret Garden Residential Subdivision will require the installation of a storm sewer system that is proposed to outlet into Pilette Drain No. 1 at the southwest corner of the Subject Lands (Figure 1). The storm sewer outlet will include riprap (without geotextile) surrounding the outlet to disperse flows as it enters the drain as outlined in OPSD 810.010 (Appendix A).

2.0 BACKGROUND DATA COLLECTION

Background resources were reviewed to inform the overall character of the drain and to develop baseline data with regards to species and habitat with the potential to occur within the work area and adjacent road ROW. Background documents and databases reviewed included:

- Aerial imagery;
- MNRF's NHIC database for SAR occurrences (2023);
- Citizen science online databases (i.e., iNaturalist); and
- DFO Aquatic SAR Mapping (2023).

The results of the background review are summarized below. This data assisted in defining targeted ecological field investigations conducted within the work area, as well as level of survey effort. Field investigations are intended to confirm and refine species occurrence data, as applicable, for in-situ habitat features present within the work area in order to inform the aquatic effects assessment provided in the subsequent sections of this report.

2.1.1 Species Occurrence Data

Species listed as endangered or threatened on the SARO list are legally protected from harm or harassment and their associated habitats are protected from damage or destruction, as per the ESA (2007).

The NHIC database (2023) was reviewed for records of provincially significant aquatic species and/or habitats occurring within the work area. Occurrence data is provided for 1 km² area squares, with one square (17LG3569) overlapping a portion of the work area. Online citizen science databases (i.e., iNaturalist) were also reviewed to identify protected species that have the potential to occur within the work area. Critical habitat and distribution data for aquatic species was reviewed through DFO's aquatic SAR mapping (DFO, 2023).

Upon the completion of the background review, it was determined that there were no records of aquatic SAR and/or SAR habitat being present within 1 km (upstream or downstream) of the work area.

3.0 FIELD INVESTIGATIONS

3.1 Aquatic Habitat

Pillette Drain No. 1 is a municipal drain that outlets into the Plymouth Park Stormwater Management Area located approximately 375 m downstream of the proposed outlet. The section of the drain within (as well as immediately upstream and downstream of) the Work Area has been classified by DFO as a Class F drain (intermittent flow with seasonal fish habitat potential).

An aquatic habitat assessment was completed for Pillette Drain No. 1. within a 60 m reach surrounding the proposed storm sewer outlet location (30 m upstream/downstream). The adjacent land consists of residential properties with mowed lawn (Photograph 4; Figure 2) and roadways (Tourangeau Road and Plymouth Drive) with pollution sources anticipated to be from road salt inputs and anthropogenic disturbances (e.g., garbage disposal from adjacent residential properties).

The aquatic habitat assessment determined the flow regime was intermittent and consistent with DFO's classification of a Class F drain. The watercourse was dry at the time of the site visit with no refugia or deep pools identified to sustain fish during periods of flow/water retention (Photographs 1-3; Figure 2). Substrate was determined to largely be composed of detritus (50%) and mulm (50%) with the detritus and existing aquatic vegetation (*Phragmites*) providing underwater cover for approximately 80% of the watercourse (Photographs 1-3; Figure 2). Bank cover consisted of terrestrial grass and *Phragmites* with limited (0-10%) canopy cover present. Migratory obstructions were limited to seasonal obstruction such as intermittent flow and seasonally perched culverts (Photograph 5 and 6; Figure 2).

Table 1: Aquatic Habitat Assessment for Pillette Drain No. 1.

Assessment Reach	60 m
Land Use(s)	Residential properties with mowed lawn
Pollution Sources	Road salt inputs (upstream & downstream) and anthropogenic disturbances/garbage disposal
Flow Regime	Intermittent
Channel Morphology	N/A
Groundwater Evidence	None

Watercourse Substrate	50% Detritus and 50% Mulm
Underwater Cover	40% organic debris, 40% <i>Aquatic Vegetation</i> , 20% none
Aquatic Vegetation	<i>Phragmites</i>
Bank Cover	Terrestrial grasses and <i>Phragmites</i>
Shade	0-10% canopy cover, some additional shade provided by <i>Phragmites</i>
Migratory Obstructions	Seasonal (intermittent drain and seasonally perched culverts upstream/downstream)

4.0 FISHERIES ACT REVIEW

4.1 DFO Standards and Code of Practice

DFO has developed several standards and code of practice that outline the risk to fish and fish habitat for common construction activities. As part of the standards and code of practice, recommended mitigation measures are included that outline how to protect fish, aquatic habitat, and adjacent terrestrial features (e.g., riparian zones). Conditions for the usage of a code of practice are outlined within the document and include the requirement to submit a notification form to the regional DFO office a minimum of 10 working days prior to work commencing. Standards are not to be used as stand-alone documents; however, they can be used in conjunction with a code of practice.

No standard or code of practice is currently available for the installation of a storm water outlet; therefore, the proposed activities must be assessed by reviewing the Pathway of Effects (**Section 4.2**) and completing an Aquatic Effects Assessment (Section 4.3) to determine appropriate mitigation requirements (Section 4.4) prior to construction occurring.

4.2 Pathways of Effects

DFO has developed Pathways of Effects (PoE) diagrams to describe potential stressors and the effect(s) that they may have on fish and fish habitat. Based on the assessment and our understanding of the project activities, a total of five PoE were identified and are summarized in Tables 2 & 3.

Table 2: Land-based Activities Pathway of Effects for Proposed Storm Sewer Outlet.

Design and Construction Components	Cleaning or Maintenance of bridges or other structures	Excavation	Grading	Riparian Planting	Streamside Livestock Grazing	Use of Explosives	Use of Industrial Equipment	Vegetation Clearing
Storm sewer outlet installation		X					X	X
Riprap installation							X	

Table 3: In-Water Activities Pathway of Effects for Proposed Storm Sewer Outlet.

Design and Construction Components	Addition or Removal of Aquatic Vegetation	Change in Timing, Duration and Frequency of Flow	Dredging	Fish Passage Issues	Marine Seismic Surveys	Organic Debris Management	Placement of Material or Structures in Water	Structure Removal	Use of Explosives	Use of Industrial Equipment	Wastewater Management	Water Extraction
Storm sewer outlet installation	X						X			X		
Riprap installation	X						X			X		

The following PoE were identified as requiring further consideration during the assessment when reviewing the likelihood of the proposed storm sewer outlet installation activities causing the death of fish and/or HADD of fish habitat:

Excavation: Excavation includes the removal of soil and rock from the land and is required in preparation of the storm water system and outlet.

Use of Industrial Equipment: Industrial equipment includes the use of any mechanical equipment required for construction, maintenance, and/or transportation and will be required throughout the storm water system construction activities (e.g., excavation, installation of pipes, and placement of riprap).

Vegetation Clearing: Vegetation clearing includes the removal or clearing of existing terrestrial vegetation within a given area. Some vegetation clearing is required in order to outlet the storm water system to the Pillette Drain No. 1.

Addition or Removal of Aquatic Vegetation: Removal of aquatic vegetation will be required within the Pillette Drain No. 1 where the riprap is to be installed.

Placement of Material or Structures in Water: The placement of material or structures below the high-water mark may include riprap, piles, infill material, dams, and/or other structures. As part of the proposed storm water system outlet installation, riprap is proposed to be placed at the outlet to dissipate flow energy into the Pillette Drain No. 1 and prevent bed and bank erosion from occurring.

4.3 Aquatic Effects Assessment

The effects identified in the PoE diagrams were assessed to determine the likelihood of causing a HADD of fish habitat and/or the death of fish. Through the completion of an Aquatic Effects Assessment (Appendix B), it was determined that the expected residual (i.e., unmitigated) effects are limited to:

- Change in substrate composition
- Change in aquatic macrophytes and substrate

When considering whether these residual effects are likely to cause death of fish and/or a HADD of fish habitat, the following factors are used to determine severity:

- **Spatial Scale (size):** The direct footprint of the project, as well as areas downstream that are indirectly affected.
- **Intensity:** The expected amount of change the area will have from the baseline condition (e.g., changes in water temperature and velocity, sedimentation, and habitat availability).
- **Duration:** The amount of time that a residual effect will persist after construction, as well as the duration of construction.

Despite the duration being permanent, it is the opinion of MTE that the proposed impacts to Pillette Drain No. 1 (i.e., storm water outlet and riprap) is unlikely to cause the death of fish or HADD of fish habitat. This assessment is mainly due to the riprap being embedded into the drain bottom and that the altered substrate and aquatic vegetation is expected to be temporary and will replenish quickly and return to the existing condition. This is further supported by the small footprint (approximately 95 m²) of the area to be impacted within Pillette Drain No. 1 as a result of the storm water outlet and riprap placement, the intermittent flow associated with the drain, and the lack of quality refuge fish habitat adjacent to the storm water outlet (phragmites dominated drain and the underground piped culverts up- and downstream).

To maintain this assessment, proper mitigation and avoidance measures are provided in Section 4.4 to reduce and/or eliminate the permanent and temporary impacts identified during the aquatic effects assessment:

4.4 Mitigation Measures

The following applicable mitigation measures carried forward from the aquatic effects assessment are recommended to be applied during construction to prevent the HADD of fish habitat and/or the death of fish:

- Drain work is to be scheduled for periods when the Pillette Drain No. 1 has no flow (i.e., dry).
- Prior to work on site, robust sediment and erosion control fencing must be installed adjacent to all retained natural features (i.e., drain banks) as per the provided drawings. Sediment and erosion control fencing should be installed according to

OPSS.MUNI 805 and inspected prior to construction to ensure that it has been installed correctly.

- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site, as per OPSS.PROV 100.
- Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species, and noxious weeds.
- Whenever possible, operate machinery beyond the stable slope limit to minimize erosion and/or disturbance to the watercourse banks.
- Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water. Non-mobile equipment within the construction area should have a permanent drip pan.
- Areas of exposed soil following construction should be stabilized with erosion control blankets along the bank, rock protection, and/or vegetation, avoiding plant species with the potential to invade the surrounding natural heritage features. A list detailing invasive, non-native plant species to avoid in southwestern Ontario has been included in Appendix C.

5.0 CONCLUSIONS

It is the opinion of MTE that the proposed activities will not result in the death of fish and/or a HADD of fish habitat provided that the recommended mitigation and avoidance measures (Section 4.4) are implemented, and monitoring occurs throughout construction to ensure maintenance is completed as and when required.

Therefore, a formal review under the Fisheries Act by DFO is not anticipated to be required to move forward with the proposed work.

Yours Truly,

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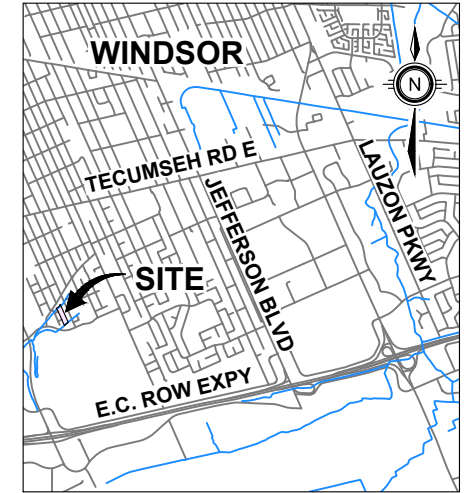
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Figures



KEY PLAN (nts)

LEGEND

----- SUBJECT LANDS

REFERENCES

SOUTHWESTERN ONTARIO ORTHOPHOTOGRAPHY PROJECT (2020), SOURCE: DATA PROVIDED BY ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY, © COPYRIGHT 2024 KING;S PRINTER OF ONTARIO, ALL RIGHTS RESERVED;
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NOTES

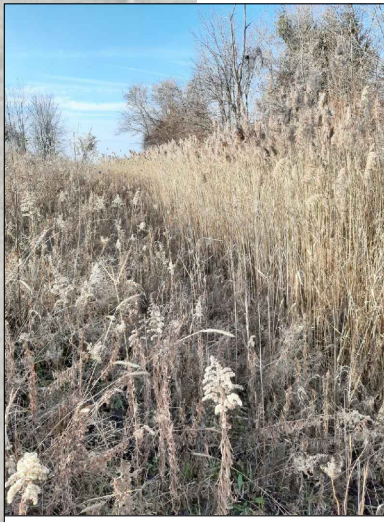
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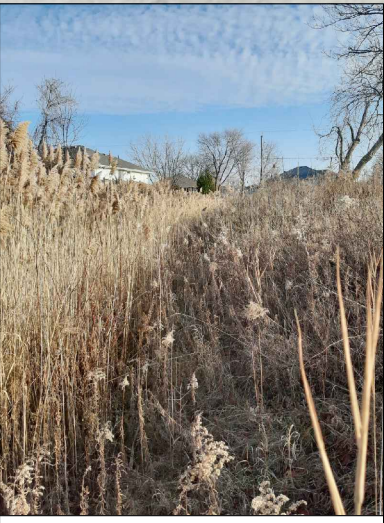
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FISHERIES ACT REVIEW SECRET GARDEN SUBDIVISION WINDSOR, ONTARIO		
TITLE		
PROJECT LOCATION WITH DEVELOPMENT OVERLAY		
Drawn	Scale	Figure 1
DCH	1:1,500	
Checked	Project No.	
	50191-101	
Date	Rev No.	
2024-02-10	0	



Photograph 1: Looking Downstream



Photograph 2: Looking Downstream



Photograph 3: Looking Upstream



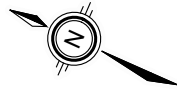
Photograph 4: Looking North-northwest



Photograph 5: Looking Upstream



Photograph 6: Looking Upstream



LEGEND

- SUBJECT LANDS
- PHOTOGRAPH
(Location and Viewing Direction)

REFERENCES

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NOTES

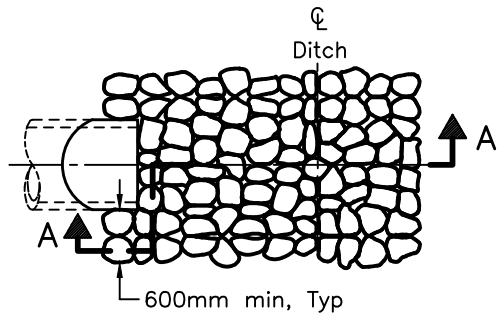
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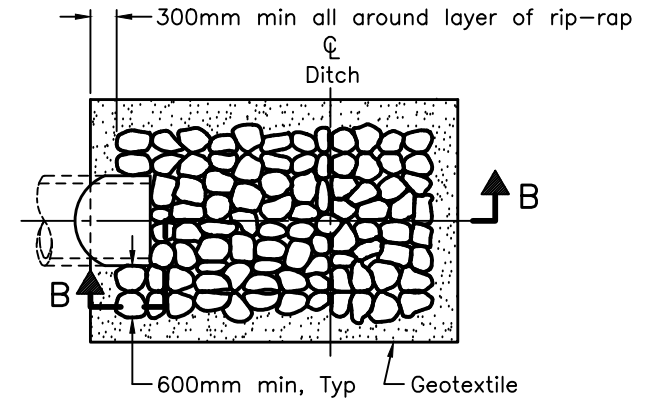
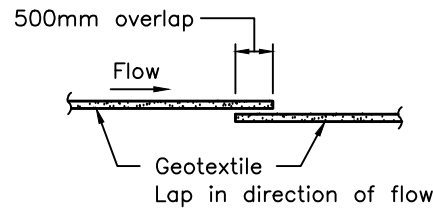
 Engineers, Scientists, Surveyors		
PROJECT FISHERIES ACT REVIEW SECRET GARDEN SUBDIVISION WINDSOR, ONTARIO		
TITLE SITE PHOTOGRAPHS		
Drawn DCH Checked Date 2024-05-02	Scale 1:1,500 Project No. 50191-101 Rev No. 0	Figure 2

Appendix A

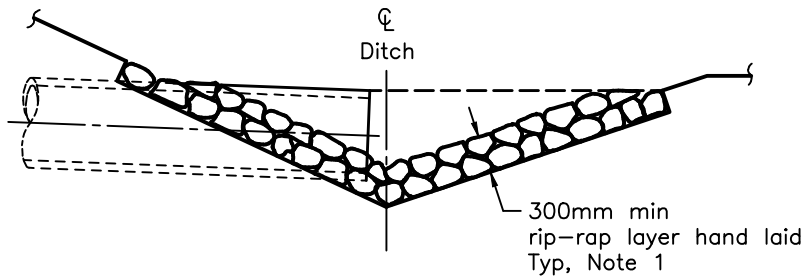
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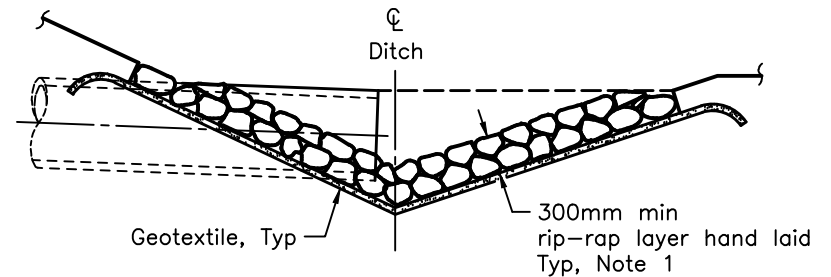
PLAN
CUT OR FILL



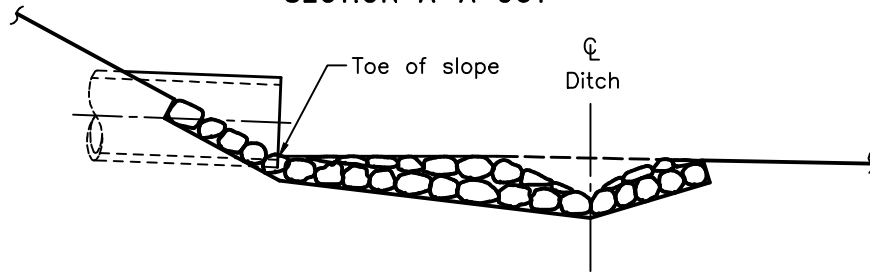
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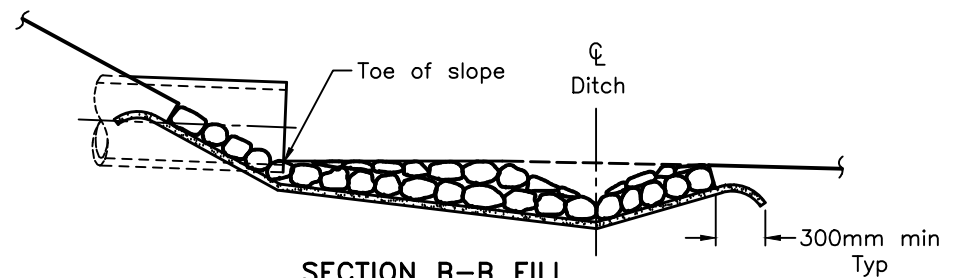
SECTION A-A CUT



SECTION B-B CUT



SECTION A-A FILL



SECTION B-B FILL

TYPE A - WITHOUT GEOTEXTILE

TYPE B - WITH GEOTEXTILE

NOTES:

1 The thickness of the rip-rap layer shall be at least 1.5 times the rip-rap mean diameter.

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

Nov 2018 Rev 3

**GENERAL RIP-RAP LAYOUT
FOR SEWER AND CULVERT OUTLETS**



OPSD 810.010

Appendix B

Aquatic Effects Assessment

Table 1. Pathway of Effect(s)

Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measure(s)	Residual Effect(s)
L2 – Excavation	Alteration of groundwater flows to surface waters	<ul style="list-style-type: none"> Excavation is temporary where the storm water system is to be installed and therefore no permanent alteration to groundwater flows is anticipated. 	<ul style="list-style-type: none"> None.
	Creation of pond, pit, or trench	<ul style="list-style-type: none"> No pond, pit, or trench creation is anticipated. 	
	Dewatering of pit or trench		
	Removal of topsoil	<ul style="list-style-type: none"> Riparian planting will occur for all areas where vegetation clearing occurred to pre-construction levels or better. 	<ul style="list-style-type: none"> None.
	Exposed soils		
	Spoil/material stockpiles	<ul style="list-style-type: none"> Sediment control measures will include sediment fencing along Pillette Drain No. 1 installed prior to work commencing and regularly inspected. Required maintenance is to be completed immediately. Spoil/materials are expected to be reused onsite for backfilling and bank restoration. 	<ul style="list-style-type: none"> None.
Increased erosion potential (bank stability and exposed soils, change in slope or drainage, and exposed soils)			
L7 & W10 – Use of Industrial Equipment	Use of mobile industrial equipment	<ul style="list-style-type: none"> Industrial equipment usage is to be limited where possible away from Pillette Drain No. 1. 	<ul style="list-style-type: none"> None.
	Increased erosion potential (bank stability and exposed soils)	<ul style="list-style-type: none"> Sediment control measures will include sediment fencing installed prior to work commencing that is regularly inspected with required maintenance being completed immediately. Equipment will be used within enclosed work areas (silt fencing adjacent to Pillette Drain No. 1). 	<ul style="list-style-type: none"> None.
	Resuspension and entrainment of sediment		

Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measure(s)	Residual Effect(s)
		<ul style="list-style-type: none"> • Work will occur when the municipal drain is dry and/or flows are low to reduce temporary sedimentation. 	
	Oil, grease, and fuel leaks from equipment (use of mobile and/or immobile industrial equipment)	<ul style="list-style-type: none"> • Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water. • Non-mobile equipment within the construction area should have a permanent drip pan. • Machinery should arrive on site in a clean condition and is maintained free of fluid leaks, invasives species and noxious weeds. • Spill kit should be kept on-site. 	<ul style="list-style-type: none"> • None.
L8 – Vegetation Clearing	Use of Industrial Equipment	<ul style="list-style-type: none"> • See <i>“Use of industrial equipment pathway”</i> 	
	Addition or removal of in stream organic structure	<ul style="list-style-type: none"> • Riparian planting will occur for all areas where vegetation clearing occurred to pre-construction levels or better. 	<ul style="list-style-type: none"> • None
	Bank stability and exposed soils	<ul style="list-style-type: none"> • Bank stability will be protected through riparian planting where vegetation clearing occurred to pre-construction levels or better and the inclusion of riprap around the storm water outlet. 	<ul style="list-style-type: none"> • None
	Increased erosion potential		
	Change in shade	<ul style="list-style-type: none"> • Riparian planting will occur for all areas where vegetation clearing occurred to pre-construction levels or better 	<ul style="list-style-type: none"> • None
	Change external nutrient/energy inputs		
	Use of herbicides	<ul style="list-style-type: none"> • Not anticipated. 	<ul style="list-style-type: none"> • None

Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measure(s)	Residual Effect(s)
W2 – Change in Timing, Duration, and Frequency of Flow	Change in timing, duration, and frequency of flow	<ul style="list-style-type: none"> • Work to be done during dry conditions 	<ul style="list-style-type: none"> • None
	Dewatering	<ul style="list-style-type: none"> • Dewatering is not anticipated to be required for the storm water outlet installation. • Flooded cofferdam areas will be dewatered as required used filter bags 	<ul style="list-style-type: none"> • N/A
	Bank erosion	<ul style="list-style-type: none"> • Riprap installation at the storm water outlet is proposed to disperse flow velocity and therefore reduce the potential for bank erosion and channel bed scouring. 	<ul style="list-style-type: none"> • None.
	Scouring of channel beds		
	Change in substrate composition	<ul style="list-style-type: none"> • Riparian planting will occur for all areas where vegetation clearing occurred to pre-construction levels or better. • Rock protection (riprap) will cause temporary substrate alteration. 	<ul style="list-style-type: none"> • Negligible – Substrate composition will be altered at the time of construction by riprap placement; however, the impact is anticipated to be temporary as substrate settles on the riprap.
W4 – Fish Passage Issues	Downstream passage of fish	<ul style="list-style-type: none"> • No obstructions (i.e., dams, instream structures, etc.) that would limit the passage of fish are anticipated to occur as a result of the storm water outlet. • Riprap apron in the drain will be installed subgrade. 	<ul style="list-style-type: none"> • None
	Alteration of migration patterns	<ul style="list-style-type: none"> • Downstream and upstream passage of fish, as well as water chemistry and temperature, are not anticipated to be impacted by the proposed 	<ul style="list-style-type: none"> • None
	Change in water chemistry and/or water temperature	<ul style="list-style-type: none"> • N/A. 	<ul style="list-style-type: none"> • N/A

Pathway of Effect(s)	Stressor (Potential Impact)	Mitigation Measure(s)	Residual Effect(s)
	Flow alteration (timing, duration, intensity)	<ul style="list-style-type: none"> Riprap will be installed within the municipal drain to reduce flow velocity from the storm water outlet. 	<ul style="list-style-type: none"> None
	Diversion channels	<ul style="list-style-type: none"> No diversion channels are required for the proposed work. 	<ul style="list-style-type: none"> N/A
W7 – Placement of Materials or Structures in Water	Change in hydraulics (change in channel morphology or shoreline morphometry)	<ul style="list-style-type: none"> Riprap is to be placed to minimize hydraulic alteration as a result of the storm water inlet. 	<ul style="list-style-type: none"> N/A
	Change in substrate	<ul style="list-style-type: none"> Restore and re-stabilize areas of the watercourse bank that are disturbed (if any) during construction to pre-construction (or better) levels. Areas within the cofferdam footprint will silt in naturally upon removal. 	<ul style="list-style-type: none"> Negligible – Removal of phragmites is likely to occur; however, the drain is dominated by phragmites and no impact (positive or negative) is anticipated as a result of the removal.
	Change in aquatic macrophytes		
	Complete constriction of flow (e.g., dams)	<ul style="list-style-type: none"> There will be no complete constriction of flow. 	<ul style="list-style-type: none"> N/A

Appendix C

Invasive, Non-native Plant Species

Invasive Non-Native Plants in the Upper Thames River Watershed

The plants listed below are non-native species that have become invasive problem weeds in the Upper Thames River watershed (Middlesex, Oxford, and Perth Counties). They can spread into natural areas and forests, displacing native plants

and the wildlife that depend on them. These non-native species should not be planted. Where possible, they should be removed to prevent further invasion.

Invasive Trees, Shrubs, Vines & Woody Groundcovers

Trees

<i>Acer ginnala</i>	Amur Maple
<i>Acer negundo</i>	Manitoba Maple or Boxelder
<i>Acer platanoides</i>	Norway Maple
<i>Ailanthus altissima</i>	Tree-of-heaven
<i>Betula pendula</i>	Weeping Birch
<i>Crataegus monogyna</i>	English Hawthorn
<i>Elaeagnus angustifolia</i>	Russian Olive
<i>Morus alba</i>	White Mulberry
<i>Pinus sylvestris</i>	Scots Pine
<i>Populus alba</i>	White Poplar, Silver Poplar
<i>Prunus avium</i>	Sweet Cherry
<i>Robinia pseudoacacia</i>	Black Locust
<i>Salix alba</i>	White Willow
<i>Salix euxina</i>	Crack Willow
<i>Sorbus aucuparia</i>	European Mountain-ash
<i>Ulmus pumila</i>	Siberian Elm

Shrubs

<i>Alnus glutinosa</i>	European Black Alder
<i>Berberis thunbergii</i>	Japanese Barberry
<i>Berberis vulgaris</i>	Common Barberry
<i>Elaeagnus umbellata</i>	Autumn Olive
<i>Euonymus alatus</i>	Winged Euonymus
<i>Frangula alnus</i>	Glossy Buckthorn
<i>Ligustrum vulgare</i>	European Privet
<i>Lonicera japonica</i>	Japanese Honeysuckle
<i>Lonicera maackii</i>	Maack's Honeysuckle
<i>Lonicera tatarica</i>	Tartarian Honeysuckle
<i>Rhamnus cathartica</i>	European Buckthorn
<i>Ribes rubrum</i>	European Red Currant
<i>Rosa multiflora</i>	Multiflora Rose
<i>Syringa vulgaris</i>	Common Lilac
<i>Viburnum opulus</i>	Cranberry Viburnum



Tartarian Honeysuckle (*Lonicera tatarica*)

Vines & Woody Groundcovers

<i>Artemisia vulgaris</i>	Common Wormwood
<i>Celastrus orbiculatus</i>	Oriental Bittersweet
<i>Hedera helix</i>	English Ivy
<i>Vinca minor</i>	Lesser Periwinkle, Myrtle
<i>Vincetoxicum nigrum</i>	Black Swallowwort
<i>Vincetoxicum rossicum</i>	European Swallowwort, Dog-strangling Vine



European Buckthorn (*Rhamnus cathartica*)

The Problem with Invasive Non-native Plants

More than 500 species of non-native plants grow "wild" in Ontario. Most of these plants were brought here from other countries or regions for food, medicine, or gardens. Not all are invasive or aggressive. The ones that have escaped cultivation and have spread widely are called invasive and are the most concerning. Many alien plants are so common, people think of them as native species.

Many non-native plants have characteristics that allow them to invade natural areas and forests. These plants:

- produce a lot of seed or have aggressive rhizomes,
- can grow in a range of soil and moisture conditions,
- are not eaten by native predators,
- out-compete and replace native plants, and
- do not provide the food and habitat required by many native insects, birds or animals.

Removing Invasive Plants

By their nature, invasive plants can be tough to get rid of. Be persistent! Methods of removal include:

- Cut or girdle shrubs or trees. Repeatedly cut any suckers (off-shoots) that re-grow.
- For perennials, cut off the top of the plant before it flowers to weaken the plant and prevent seeding.
- Pull or dig up and remove individual plants or shrubs.
- Do NOT compost these plants as they may re-sprout or the seeds may remain viable. Put cuttings/plants in black plastic garbage bags and put in the garbage.
- Lay heavy black plastic over invasive groundcover for a season to smother and kill the non-native plants.
- Apply (spot treat) an appropriate herbicide for persistent trees, shrubs, and plants or for large infestations. Consult a licensed pesticide applicator for advice.
- Seek professional advice for Giant Hogweed. See UTRCA factsheet.

Invasive Herbaceous Plants

(Plants that die back every year and re-grow from seed or perennial roots)

<i>Aegopodium podagraria</i>	Goutweed	<i>Leonurus cardiac</i>	Common Motherwort
<i>Ajuga reptans</i>	Bugleweed	<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil
<i>Alkekengi officinarum</i>	Strawberry Ground-cherry, Chinese Lantern	<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Alliaria petiolata</i>	Garlic Mustard	<i>Malva moschata</i>	Musk Mallow
<i>Anthriscus sylvestris</i>	Wild or False Chervil	<i>Melilotus</i> spp.	Sweet Clover
<i>Asperula odorata</i>	Sweet Woodruff	<i>Melissa officinalis</i>	Lemon Balm
<i>Butomus umbellatus</i>	Flowering-rush	<i>Mentha x piperita</i>	Peppermint
<i>Campanula rapunculoides</i>	European Bellflower	<i>Myriophyllum spicatum</i>	Eurasian Water-milfoil
<i>Centaurea maculosa</i>	Spotted Knapweed	<i>Origanum vulgare</i>	Wild Marjoram, Oregano
<i>Chelidonium majus</i>	Greater Celandine	<i>Pastinaca sativa</i>	Wild Parsnip
<i>Cirsium arvense</i>	Field Thistle	<i>Phragmites australis</i>	Common Reed, Phragmites
<i>Convallaria majalis</i>	European Lily-of-the-valley	<i>Ranunculus acris</i>	Common Buttercup
<i>Coronilla varia</i>	Crown Vetch	<i>Reynoutria japonica</i>	Japanese Knotweed
<i>Elymus repens</i>	Quackgrass	<i>Rumex crispus</i>	Curled Dock, Yellow Dock
<i>Epipactis helleborine</i>	Broad-leaved Helleborine	<i>Securigera varia</i>	Purple Crown-vetch
<i>Epilobium hirsutum</i>	Hairy Willow-herb	<i>Silene latifolia</i>	White Campion
<i>Euphorbia cyparissias</i>	Cypress Spurge	<i>Sonchus</i> spp.	Sow-thistles
<i>Euphorbia virgata</i>	Leafy Spurge	<i>Tanacetum vulgare</i>	Common Tansy
<i>Galium molluga</i>	White Bedstraw	<i>Trifolium pratense</i>	Red Clover
<i>Geranium robertianum</i>	Herb-Robert	<i>Tussilago farfara</i>	Coltsfoot
<i>Glechoma hederacea</i>	Ground-ivy, Gill-over-the-ground	<i>Veronica officinalis</i>	Common Speedwell
<i>Helianthus tuberosus</i>	Jerusalem Artichoke*		
<i>Hemerocallis fulva</i>	Orange Daylily		
<i>Heracleum mantegazzianum</i>	Giant Hogweed**		
<i>Hesperis matronalis</i>	Dame's Rocket		
<i>Hydrocharis morsus-ranae</i>	European Frog's-bit		
<i>Hypericum perforatum</i>	Common St. John's-wort		
<i>Impatiens glandulifera</i>	Purple Jewelweed		
<i>Iris pseudacorus</i>	Yellow Iris, Yellow Flag		
<i>Lamium purpureum</i>	Purple Dead-nettle		
<i>Lathyrus latifolius</i>	Everlasting Pea, Sweet Pea		

* May be native in floodplains.

** GIANT HOGWEED ALERT!

Giant Hogweed (*Heracleum mantegazzianum*) poses a serious hazard for humans. Its clear, watery sap contains toxins that can cause severe skin inflammation. You can get severe burns if the sap gets on your skin and the skin is then exposed to sunlight. See UTRCA factsheet.



Giant Hogweed (*Heracleum mantegazzianum*)
Photo: J Perreira, courtesy Ontario Invasive Plant Council



Common Reed, Phragmites (*Phragmites australis*)

Helpful Websites

- Ontario Invasive Plant Council - www.ontarioinvasiveplants.ca
- Ontario's Invading Species Awareness Program - www.invadingspecies.com

Additional Information at www.thamesriver.on.ca

- Recommended native trees and shrubs; wildflowers and grasses; tallgrass prairie plants
- Nurseries that sell native plants
- Giant Hogweed and Buckthorn factsheets
- Exotic non-native wildlife list

List compiled by Upper Thames River Conservation Authority staff, updated 2021.



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