Appendix F
Aquatic Assessment Report
Aquatic Assessment Report

Gordon Dean Avenue - Schedule ‘C’ Municipal Class
Environmental Assessment (Phases 3 & 4)
Hamilton, ON
Project # TP115082
Aquatic Assessment Report

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Hamilton, ON
Project # TP115082

Prepared for:
Fruitland Winona Block 1 Development Group
4 Hughson Street South, Suite 1000, Hamilton, ON L8N 3Z1

Prepared by:
Wood Environment and Infrastructure Solutions
900 Maple Grove Road, Unit 10
Cambridge, ON, N3H 4R7, Canada

May 28, 2020

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1.0 Introduction

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) was retained by Fruitland – Winona Block 1 Development Group (FWDG) to complete an Aquatic Assessment Report in support of the Gordon Dean Avenue – Schedule ‘C’ Municipal Class Environmental Assessment (Class EA) Phases 3 & 4 (the Project). The Project proposes a new north-south road (Gordon Dean Avenue) from Barton Street to Highway 8, and a new east-west road connection (Collector Road ‘B’) to Sherwood Park Drive at Fruitland Road from Gordon Dean Avenue (Figure 1). This document summarizes existing information for Watercourse 5.0, which crosses the proposed east-west road, and provides a review of anticipated impacts associated with the Project, which will involve realignment of a section of Watercourse 5.0 at the proposed road crossing, to the west, to facilitate construction of a new span culvert as part of the Project works. Additional details about proposed project works are provided in Section 5.1.

1.1 Background

In 2011, the City of Hamilton completed the Class EA Study for Fruitland Road from Barton Street to Highway 8. It followed the Municipal Engineers Association’s (MEA) Municipal Class EA process for Phases 1 and 2 and recommended that trucks use a new road, travelling north-south, and east of the existing Fruitland Road between Highway 8 and Barton Street. This preferred alternative was confirmed as a Schedule ‘C’ project, as such, completion of Phases 3 and 4 of the Municipal Class EA planning process was required either by following the Municipal Class EA process or the Integrated Planning Act process (AECOM, 2011). In 2017, Fruitland-Winona Development Group initiated the Gordon Dean Avenue - Schedule ‘C’ Municipal Class EA (Phases 3 & 4) (the Project) with direct input from the City of Hamilton. Alternative alignments were evaluated, and a preferred alternative was determined.

This report provides information pertaining to the existing aquatic environment related to the proposed road crossing of the existing Watercourse 5.0 channel (proposed crossing location) and the Aquatic Study Area (Study Area), for the preferred alternative, and identifies potential and known impacts associated with proposed Project works, and prescribes avoidance and mitigation measures to help reduce potential negative impacts.
200 m Downstream
50 m Downstream
20 m Upstream
50 m Upstream
Gordon Dean Avenue
Collector Road B

Legend
- Crossing Location
- Flow Direction
- Aquatic Study Area
- Aquatic Zone of Detailed Assessment
- Watercourse
- Proposed Road Boundary
- Waterbody

NOTES:
- Base data from LID, obtained 2019
- Imagery from ESRI. 2018

GORDON DEAN SCHEDULE C EA
Project Location

Document Path: P:\2020\Projects\NOPROJECTNUMBER_GordonDeanEA\11_GIS\MXD\Project_Location_Fish_Habitat_3.mxd

DATE: May 2020
PROJECT #: TP115082
SCALE: 1:8,000
2.0 Agency Consultation

An application for a Licence to Collect Fish for Scientific Purposes (LCFSP) was submitted to the Ministry of Natural Resources and Forestry (MNRF) on March 9, 2020 and LCFSP No. 1095394 was received March 12, 2020. A mandatory permit report will be submitted to MNRF prior to December 31, 2020.

It is recommended to contact the MNRF and Hamilton Conservation Authority (HCA) regarding potential work permit requirements related to the Lakes and Rivers Improvement Act to confirm possible impacts to the development schedule. Consultation with Fisheries and Oceans Canada (DFO), specifically the submission of a Request for Project Review is also recommended to confirm whether the proposed loss of fish habitat related to the watercourse realignment will require an authorization under the Fisheries Act.

3.0 Methodology

3.2 Species at Risk

The potential for Species at Risk (SAR) and SAR habitat (i.e., candidate) to occur within the proposed crossing location and associated Study Area was determined based on a review of the MNRF Natural Heritage Information Center (NHIC) online database (one (1) square kilometre (km) tiles 17PH0585 and 17PH0586) (NHIC, 2020) and DFO online aquatic SAR mapping (DFO, 2020).

3.1 Aquatic Ecosystem

Qualified Aquatic Wood staff executed a field investigation on March 19, 2020. The field investigation included an aquatic habitat assessment upstream and downstream of the proposed crossing location and a fish community survey, through the use of a backpack electrofisher. The habitat assessment included detailed assessment 50 m downstream and 20 m upstream of the proposed crossing location, with a general assessment performed for the additional 150 m downstream and 30 m upstream of the proposed crossing location. Approximately 60 m of the watercourse, downstream of the proposed crossing location, was not accessible due to property access. Field conditions were assessed following the Ontario Ministry of Transportation (MTO) Environmental Guide for Fish and Fish Habitat (MTO, 2009). The fish community survey was conducted using a Halltech backpack electrofishing unit, with one (1) netter, for a total effort of 993 seconds.

4.0 Existing Conditions

4.1 Species at Risk

No aquatic SAR were identified within the online databases reviewed for the Study Area. Additionally, no aquatic SAR were observed during the field investigation.

4.2 Aquatic Ecosystem

Aerial imagery indicates the Study Area is within a first order stream, originating south of Highway 8 and west of Fruitland Road, approximately 1.3 km southwest of the Study Area, within the Stoney Creek Numbered Watercourses subwatershed (HCA, 2020). Watercourse 5.0 flows north through the proposed crossing location, entering Lake Ontario approximately 1.6 km north of the Study Area.
Substrate was generally comprised of clay, gravel and silt, with isolated areas containing cobble throughout the Study Area. Minor meanders were present within the channel, with the channel generally in a north/south orientation. The majority of the Study Area was bordered by meadow and thicket habitat, with residential properties to the west, north (downstream) of the proposed crossing location. An approximate 70 m length of the watercourse, downstream of the proposed crossing location, was bordered by lawn on one or both sides. A portion of the surrounding land to the east of the Study Area, beyond the thicket, exhibited characteristics of historical agricultural use. Fruitland Road is located 40 m to 85 m west of Watercourse 5.0 within the Study Area. Approximately 60 m of Watercourse 5.0 downstream of the proposed crossing location, was not surveyed, as it extends into private lands, where no permission to access was provided at the time the field investigation was completed.

No specialized habitat or groundwater upwelling was observed during the field investigation. The defined channel, visible high-water mark along the banks and lack of terrestrial vegetation within the channel suggest that WC-5.0 within the aquatic Study Area is a permanent watercourse, although areas of low flow during drier periods (e.g. summer) are anticipated to impede fish passage. Surveys conducted by Wood near Highway 8, approximately 530 m south (upstream) of the crossing location, independent of this Class EA, documented flow during surveys in summer 2019 and spring 2020, though water depth was low (approx. 0.05 m). The reach of WC-5.0 between Highway 8 and Barton Street, which includes the proposed crossing location, is identified as having permanent flow based on surveys conducted in May 2009 (Dillon Consulting Ltd., 2010). Field investigations previously conducted by Wood (October 2017) observed WC-5.0 to be dry near Barton Street, approximately 545 m north of the proposed crossing location, with flow present in the spring (April 2017). A survey of the watercourse beginning south of Barton Street and continuing downstream (north) to Lake Ontario, identified WC-5.0 as predominantly permanent (Dillon Consulting, 2007).

Within the Study Area, trees were present along the banks, providing partial or almost complete cover, for the majority of the stretch, as well as farther upstream and downstream. In portions of the Study Area, and outside of the Study Area, the treed vegetation along the channel is very narrow. This riparian vegetation may assist in moderating temperatures within Watercourse 5.0 during the summer months.

**Fish and Fish Habitat**

No fish were observed or collected during the Wood 2020 fish community survey, suggesting WC-5.0 provides indirect fish habitat. This is consistent with an electrofishing survey completed in May 2009, which did not record any fish (Dillon Consulting Ltd., 2010). Additionally, Wood completed fish community surveys approximately 530 m south of the proposed crossing location in summer 2019 and spring 2020, with no fish recorded.

Potential fish barriers (at least part of the year) were observed at one (1) location downstream of the Study Area, and two (2) locations within the Study Area, due to low water level, steep difference in watercourse elevation, sediment bar and large woody debris (refer to Figure 2, Appendix A).

Project photographs and field sheets are provided in Appendix A. Aquatic habitat mapping
as collected during the field investigation is illustrated on Figure 2.

**Downstream of Proposed Crossing Location**

**0 to 50 m Downstream**

The initial 50 m downstream of the proposed crossing location was comprised of predominantly flat morphology, with runs and riffles also present. The mean measured wetted width and depth were 1.5 m and 0.22 m, respectively. Riffle depth averaged 0.15 m and one (1) pool, with a depth of 0.4 m was present. Substrate comprised of clay (40%), gravel (30%), silt (20%) and cobble (10%). Erosion was present on both banks, which appeared stable, with bank height ranging from approximately 0.5 m to 1.5 m. Herbaceous vegetation and deciduous trees were present along the banks, providing approximately 80% riparian cover. The surrounding riparian area included thicket along the east side of the watercourse, with localized meadow habitat present along the west side for a width ranging from 11 m to 40 m. Residential properties are present west of WC-5.0, with Fruitland Road approximately 65 m to 80 m west of the watercourse (Refer to Figure 2).

**50 m to 200 m Downstream**

Within this 150 m long section, wetted width and depth generally ranged from one (1) m to three (3) m and 0.1 m to 0.4 m, respectively, with a pool having an increased wetted width and depth of 3.3 m and 0.65 m, respectively. Additionally, small shallow areas less than 0.1 m deep were observed. Flat and run morphology was dominant and substrate was characterized as a combination of clay, gravel and silt. Large woody debris was present approximately 150 m downstream of the proposed crossing location, with an increase of 0.1 m in watercourse elevation, which may impede fish passage, at least part of the year (refer to Figure 2; Appendix A, photographs 20 and 21). An increase of 0.1 m in watercourse elevation was present at the location of the debris. Deciduous trees were present along both banks, providing approximately 80% riparian cover, with thickets present east and west of Watercourse 5.0, for the majority of this 150 m section. Fruitland Road is approximately 40 m to 58 m west of Watercourse 5.0 within this section. Approximately 60 m of the watercourse was not accessible, as it flowed through private residential properties where no access was provided and was partially bordered by lawn on both banks. Aerial imagery shows Watercourse 5.0 flowing through dense commercial and industrial development, before its outlet to Lake Ontario. A potential barrier to fish passage was located downstream of this 150 m section, just upstream of an access path across Watercourse 5.0 (refer to Figure 2; Appendix A, photographs 18 and 19). At this location, a 0.25 m difference in ground elevation occurs over a two (2) m length, flowing over bedrock with approximately 0.06 m water depth. At the top of this incline, tree roots protrude 0.28 m above the channel bed, across the entire width of the channel. A wetted width of 2.2 m was recorded at this location, with water only flowing over 0.55 m of the channel on the west side. The combination of the increase in ground elevation over an area with low flow and bedrock substrate, and the protruding tree roots at the top of this elevation increase, may impede fish passage, at least part of the year.

**Within the Proposed Crossing Location**

The approximately 30 m long section of WC- 5.0 within the right-of-way for the proposed road crossing, is generally straight with flat and run morphology. The measured average
wetted width and depth was 1.4 m and 0.15 m, respectively, with a minimum and maximum depth of 0.04 m and 0.16 m, respectively. Substrate was consistent with rest of the Study Area and was comprised of clay (40%), silt (30%), gravel (25%) and cobble (5%). The approximately 1.3 m high banks contained herbaceous vegetation and deciduous trees, providing approximately 50% riparian cover.

**Upstream of Proposed Crossing Location**

**0 m to 20 m Upstream**

The initial 15 m upstream of the proposed crossing location measured a mean wetted width and depth of one (1) m and 0.07 m, respectively, with flat and riffle morphology, meandering slightly to the west. Substrate remained consistent, with a combination of clay (40%), gravel (30%), silt (20%) and cobble (10%). Watercourse 5.0 then widens, with a wetted width of 3.5 m and depth of 0.15 m to 0.29 m. A potential fish barrier, at least part of the year, is present at this location due to debris, cobble and a small island bar (refer to Figure 2; Appendix A, photographs 11 and 12). A circular metal culvert is immediately upstream of this widened portion of the channel, with a diameter and length of 1.3 m and 4.5 m, respectively. Water within the culvert was 0.6 m to one (1) m wide and 0.17 m deep. Herbaceous vegetation and deciduous trees were present along the banks within the section of open channel, providing approximately 50% riparian cover. Minor erosion was evident, with undercut banks on both sides of the culvert. Meadow habitat was present on both sides of the channel, with sparse European Buckthorn (*Rhamnus cathartica*) and stunted White Ash (*Fraxinus americana*) along the east side. The meadow community to the west of Watercourse 5.0 appears to have previously used for agricultural purposes. The culvert provides access over Watercourse 5.0, with grass growing on the access path over top the culvert. Fruitland Road is present approximately 85 m west of Watercourse 5.0 along this 20 m section.

**20 m to 50 m Upstream**

This section of Watercourse 5.0 (30 m length) recorded a mean wetted width and depth of 1.3 m and 0.23 m, respectively, with flat and run morphology. Consistent with the characteristics observed downstream, substrate material was comprised of clay (60%), silt (25%), gravel (20%) and cobble (5%). Deciduous trees were present along both banks, providing 80% to 90% cover, for this entire section. A thicket community was present to the east of Watercourse 5.0, while a meadow community was observed along the west side, outside of the treed area along the channel. Fruitland Road is located 85 m west of Watercourse 5.0 along this 30 m length.
NOTES:
- Basedata from LIO, obtained 2019
- Imagery from Google. 2018
5.0 Impact Assessment and Mitigation

The following section provides a summary of potential direct and indirect impacts to the aquatic environment relative to the Project works and provides recommended measures and strategies to avoid, minimize and/or reduce impacts and associated risks.

5.1 Proposed Works

It is noted that full realignment of Watercourse 5.0 is being proposed as part of the ongoing Servicing Strategy for Block 1. For the purposes of this EA, a span culvert is proposed to be installed west of the existing channel of Watercourse 5.0. A small section of Watercourse 5.0 at the road crossing is proposed to be realigned to facilitate the construction of the new culvert along the east-west corridor. The section of creek within the culvert will be considered a permanent location, which will be further characterized as part of detailed design. In order to complete this, two temporary watercourse channels are proposed to be constructed at the inlet and outlet of the new culvert that will connect with existing Watercourse 5.0. These channels will be designed as part of the detailed design phase, in connection with a geomorphologist, as required. To minimize impacts, it is proposed that flow shall be maintained through the existing channel while the span culvert and new channel are constructed in the dry, with embankments at the upstream and downstream ends to isolate the constructed realignment from the existing active channel.

Once the ongoing Block1 Servicing Strategy is complete, in addition to future development plans as part of the Secondary Plan, the permanent channel for Watercourse 5.0 will be designed to tie into the proposed culvert. A preliminary drawing of the span culvert is provided in Appendix B. The ultimate dimensions and location of span culvert will be determined at the detailed design phase.

Commissioning of the new channel will be done during the appropriate phase of construction following best management practices to mitigate the likelihood of downstream impacts (e.g., sediment releases) or harm to fish.

The proposed road will have an approximate right-of-way of 26 m, with one (1) lane in each direction, and a sidewalk on each side of the roadway, separated from the road by a boulevard.

5.2 Potential Aquatic Ecosystem Impacts

To accommodate the proposed crossing of WC-5.0 by Collector Road ‘B’, an open footed span culvert is proposed to be installed immediately to the west of the existing channel. A small section of WC-5.0 at the road crossing is proposed to be realigned to accommodate the new culvert location, which facilitates the majority of construction to occur in isolation of the existing watercourse. Under preliminary configuration, approximately 90 m of WC-5.0 will be realigned with a new channel approximately 92 m long.

To minimize impacts, it is proposed that flow shall be maintained through the existing channel while the span culvert to cross Collector Road ‘B’ and new channel are constructed in the dry, with embankments at the upstream and downstream ends to isolate the constructed realignment from the existing active channel. The realigned channel will consider geomorphological principles to provide smooth hydraulic transitions between the constructed and existing channel as well as aquatic habitat features consistent with the
reach. A channel through the open footed bottom of the structure will also be based on have fluvial and habitat design considerations. The opening of the structure will provide channel continuity with the floodplain and maintain wildlife corridor functions along the watercourse valley system. The new channel section will be designed as part of the detailed design phase, in connection with a geomorphologist and ecologist input, as required.

Potential impacts may occur unless mitigated which include: Introduction of sediments, concrete and other deleterious substances:

- Alteration of flows due to adjustment of in-water structures;
- Disruption of critical fish life stages;
- Erosion and sedimentation due to the operation of machinery; and
- Loss of vegetative cover within the riparian zone and over the watercourse, therefore potentially impacting existing thermal regime.

Several mitigation measures can be implemented to help reduce the negative impacts identified above.

### 5.3 Avoidance and Mitigation Measures

General mitigation measures are described below which will help reduce the negative impacts of the road construction project. The review of avoidance and mitigation shall be further reviewed during future stages of the Project (i.e., detailed design), to ensure those measures prescribed coincide with specific Project works and locations. Additionally, a meeting with the HCA will assist with refining mitigation measures to be implemented.

Though fish presence was not confirmed during the field investigation, mitigation measures to protect fish are included.

#### 5.3.1 General

- A vegetation protection buffer of a minimum of 15 m is recommended from either side of Watercourse 5.0, measured from the bankfull channel to correspond with City of Hamilton policy directives for urban watercourses with warm water and important and marginal habitat. The vegetation protection zone will be addressed via Servicing Strategy for Block 1, in consultation with appropriate agency (e.g., HCA). However, necessary work may encroach within this 15 m buffer, such as the road crossing and culvert installation and associated bank stabilization works;
- Project activities shall be scheduled to avoid wet and rainy periods and in-water works shall be conducted during low flow condition;
- All dewatering discharge, if required, shall be directed to a filter bag to remove sediments. The filter bag shall be located in an area that is sufficiently vegetated, stable and does not display any evidence of erosion or instability;
- Operate, store, and maintain equipment, vehicles, and associated materials in a manner that prevents the entry of any deleterious substance from entering into the natural environment as indicated in Ontario Provincial Standard Specification (OPSS) 182 (Environmental Protection for Construction in Waterbodies and on
Waterbody Banks), OPSS 517 (Construction Specification for Dewatering) and OPSS 805 (Construction Specification for Temporary Erosion and Sediment Control Measures);

- Temporarily store, handle and dispose of all materials used or generated (e.g. organics, soils, construction waste and debris, etc.) during site preparation, construction, and clean-up in a manner that prevents their entry to any watercourse. To the extent possible, restrict the temporary on-site storage of sediment generated as part of the Project works;
- Ensure a Spill Management Plan (including spill kit materials, instructions regarding their use, education of staff, and emergency contact numbers) is present on-site at all times for implementation in the event of an accidental spill. All spills are to be reported to the MECP Spills Action Centre (SAC) at 1-800-268-6060;
- Any stockpiled materials shall be properly contained, stored and stabilized away at least 30 m from any watercourse or waterbody;
- All construction materials shall be removed from site upon project completion;
- All localized re-grading and creation of the new channel bed and banks that transition to the existing channel and bank should be designed and constructed to be stable and carefully inspected to ensure they transition smoothly with the adjacent channel connections. The transition areas should then be inspected again to ensure they remain stable and smooth, and no erosion points develop;
- The existing metal culvert, upstream of the proposed crossing location, may be used during construction to facilitate access across Watercourse 5.0; and
- Project works will comply with required permitting and authorizations, based on consultation with HCA, DFO and MNRF.

5.3.2 Fish and Fish Habitat

- Based on the absence of fish during the field investigation, it is anticipated the timing window permitting in-water work from July 16 to March 14 of any year will be implemented, however this will be confirmed via consultation with HCA and MNRF;
- If used, any pumps and associated hoses conveying water in Watercourse 5.0 during construction will be appropriately screened to prevent entrainment of fish;
- Though no fish were detected during the field investigation, it is recommended that the contractor obtain a Licence to Collect Fish for Scientific Purposes (LCFSP) from the MNRF and a fish rescue and relocation plan be implemented after isolation of the in-water work area (if required); and
- Design and construct a new realignment of equal or greater area than that of the lost existing channel, under guidance of a geomorphologist, as required.

5.3.3 Sediment and Erosion Control Measures

- Standard erosion and sediment control (ESC) measures (e.g. silt fence) shall be applied consistent with OPSS to ensure no negative effects to surface waters. The control measures shall be implanted prior to work and be maintained during project
works and until disturbed areas will be reinstated to original or improved condition, upon completion of works; and

- All ESC measures that are non-biodegradable should be removed from the site when work is complete and the site is stabilized.

5.3.4 Shoreline / Bank / Vegetation / Stabilization

- The disturbance or removal of riparian vegetation should be minimized;
- Construction access, work areas and associated requirements for removal of riparian vegetation will be minimized to the extent required for the construction activities. All temporarily disturbed areas will be re-stabilized following construction using appropriate means;
- Banks disturbed by any activity associated with the project will be stabilized immediately to prevent erosion and / or sedimentation, preferably through re-vegetation with native species suitable for the site and / or other suitable and approved methods; and
- In the event that riverstone erosion protection / armouring is required to stabilize eroding or exposed areas, appropriately-sized, clean rock will be used. Rock will be installed at a similar slope to maintain a uniform bank and bed, as well as the proposed new channel connections.

5.3.5 Operation of Machinery

- Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks, invasive species and noxious weeds as indicated in OPSS 182;
- Construction staging shall occur in a manner to prevent spills and / or leaks into the creek;
- Implement drip pans under equipment (i.e. generators, pumps, etc.) in operation within the work areas; and
- Any refueling is to be undertaken at least 30 m from any watercourse or any other surface drainage feature as indicated OPSS 180 (Management of Excess Materials) and OPSS 182.

6.0 Anticipated Permit and Approvals

Consultation with HCA and MNRF will be required to confirm Project requirements under applicable legislation, including O.Reg 155/06 (HCA) and the Fish and Wildlife Conservation Act (FWCA) (MNRF). Consultation shall include permit requirements, in-water work timing windows and refining mitigation measures associated with Watercourse 5.0, to be carried forward. Consultation will include confirmation of vegetation protection buffers to be applied to Watercourse 5.0.

Due to construction activities, including realigning a portion of the existing channel, a Request for Review submission to DFO is anticipated. This submission would be completed during detailed design, as it will require specific details of the proposed work activities, including staging and mitigation measures. In the event channel realignment is
required to facilitate culvert construction, a fluvial geomorphologist assessment may also be required.

7.0 Summary

Based on the Wood aquatic field investigation and proposed Project involving the construction of a road crossing over Watercourse 5.0, requiring the installation of a span culvert, and realignment of a small section of Watercourse 5.0 west of the existing channel. Once the ongoing Block1 Servicing Strategy is complete, in addition to future development plans as part of the Secondary Plan, the permanent channel for Watercourse 5.0 will be designed to tie into the proposed culvert. A preliminary drawing of the span culvert is provided in Appendix B. The ultimate dimensions and location of span culvert will be determined at the detailed design phase.

- The above noted mitigation measures will assist with mitigating negative impacts on the aquatic environment and shall be further reviewed and refined during the detailed design phase, based on further consultation with HCA, MNRF and DFO.
- Watercourse 5.0 is part of the Stoney Creek numbered watercourses subwatershed and is regulated by HCA (O.Reg 155/06);
- No fish were observed during the spring 2020 field investigation within the Study Area. Additionally two (2) fish surveys completed by Wood in fall 2019 and spring 2020, approximately 500 m upstream of the Study Area, did not result in any observations of fish;
- Watercourse 5.0 is considered to be a permanent watercourse within the Study Area;
- Based on the absence of fish during the field investigation, it is anticipated the timing window permitting in-water work from July 16 to March 14 of any year will be implemented, however this will be confirmed during agency consultation;
- A vegetation protection buffer will be required. The set buffer requirements shall be confirmed through further consultation with HCA;
- A Request for Review by DFO is anticipated during the detailed design phase; and
- During detailed design, an ESC, spill prevention, and fish rescue and relocation plan shall be developed.
8.0 Closure
This report has been prepared based on Wood's current understanding of the proposed Project and the results obtained from field investigations relative to the proposed crossing location.

If you should have any questions regarding this submittal or require further Project related information, please contact the undersigned.

Sincerely,

Wood Environment & Infrastructure Solutions,
a Division of Wood Canada Limited

Prepared By: Roxanne Dibbley, B.Sc.
Per: Aquatic Biologist

Reviewed By: Dale Klodnicki, M.E.Sc., C.E.T.
Per: Senior Aquatic Ecologist
9.0 References
AECOM. 2011. Municipal Class Environmental Assessment Study. Fruitland Road from Barton Street to Highway 8. PHASES 1 & 2 REPORT. (City of Hamilton)


Dillon Consulting Ltd. (2010). Natural Heritage Assessment of Lands Bounded by Frutiland Road, Glover Road, Barton Street and Highway 8.


### Appendix A

**Representative Photographs**

#### Project Photos

<table>
<thead>
<tr>
<th>Project Photo</th>
<th>Description</th>
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<tbody>
<tr>
<td><img src="image1.jpg" alt="Photo 1" /></td>
<td>Photo 1: Approximately 50 m downstream of crossing location, facing downstream</td>
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<tr>
<td><img src="image2.jpg" alt="Photo 2" /></td>
<td>Photo 2: Approximately 50 m downstream of crossing location, facing upstream</td>
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<td><img src="image3.jpg" alt="Photo 3" /></td>
<td>Photo 3: Approximately 20 m downstream of crossing location, facing downstream</td>
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<td>Photo 4: Within crossing location, facing downstream</td>
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<td>Photo 5: Within crossing location, facing downstream</td>
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<td>Photo 6: Within crossing location, facing upstream</td>
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</table>
Within crossing location, facing west

Within crossing location, facing east bank

Upstream of crossing location, facing downstream
<table>
<thead>
<tr>
<th>Upstream of crossing location, facing upstream</th>
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</thead>
<tbody>
<tr>
<td>Approximately 15 m upstream of crossing location, facing upstream</td>
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<tr>
<td>Approximately 15 m upstream of crossing location, facing upstream</td>
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</tbody>
</table>
On culvert crossing, facing downstream.

Upstream of existing culvert crossing, facing downstream.

Upstream of existing culvert crossing, facing upstream.
<table>
<thead>
<tr>
<th>Photo</th>
<th>Location Description</th>
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<tbody>
<tr>
<td><img src="image1.jpg" alt="Facing east across Watercourse 5.0 crossing location" /></td>
<td>Facing east across Watercourse 5.0 crossing location</td>
</tr>
<tr>
<td><img src="image2.jpg" alt="Facing west across Watercourse 5.0 crossing location" /></td>
<td>Facing west across Watercourse 5.0 crossing location</td>
</tr>
<tr>
<td><img src="image3.jpg" alt="Potential fish barrier downstream of the Study Area, facing upstream. Photo 1 of 2 at this location." /></td>
<td>Potential fish barrier downstream of the Study Area, facing upstream. Photo 1 of 2 at this location.</td>
</tr>
<tr>
<td>Potential fish barrier downstream of the Study Area, facing upstream. Photo 2 of 2 at this location.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Potential fish barrier approximately 150 m downstream of crossing location. Photo 1 of 2 at this location.</td>
<td></td>
</tr>
<tr>
<td>Potential fish barrier approximately 150 m downstream of crossing location. Photo 2 of 2 at this location.</td>
<td></td>
</tr>
</tbody>
</table>
## WATERCOURSE FIELD COLLECTION FORM

### GENERAL INFORMATION

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Description:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP115082</td>
<td>Gordon Dean Avenue proposed road</td>
<td>March 17, 2020</td>
</tr>
</tbody>
</table>

Is Stream Realignment required for this section:
- [ ] Yes
- [ ] No
- [ ] Unknown

<table>
<thead>
<tr>
<th>Collectors:</th>
<th>Time Started:</th>
<th>Time Finished:</th>
</tr>
</thead>
<tbody>
<tr>
<td>R. Dibbly</td>
<td>—</td>
<td>14:30</td>
</tr>
</tbody>
</table>

Weather Conditions:
- [ ] Cloudy

<table>
<thead>
<tr>
<th>Air Temp (°C):</th>
<th>Water Temp (°C):</th>
<th>Conductivity (μS/cm):</th>
<th>Velocity (m/s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Photos Numbers And Descriptions:

### LOCATION

<table>
<thead>
<tr>
<th>Name of Waterbody:</th>
<th>Drainage System:</th>
<th>Crossing #:</th>
<th>Station #:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unnamed Creek</td>
<td>Lake Ontario</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Location Of Crossing:
- [ ] N of Hwy 8, S of Barton St, E of Fruitland Road

GPS Coordinates:
- [ ] 47.85846

MTO Chainage:
- [ ] —
**Ontario**

Ministry of Transportation

<table>
<thead>
<tr>
<th>Township:</th>
<th>MNRF District:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hamilton</td>
<td>Guelph</td>
</tr>
</tbody>
</table>

**LAND USE AND POLLUTION**

<table>
<thead>
<tr>
<th>Surrounding Land Use:</th>
<th>Sources of Pollution:</th>
</tr>
</thead>
<tbody>
<tr>
<td>meadow Residential (west)</td>
<td>roads</td>
</tr>
<tr>
<td>Fruitland Road</td>
<td></td>
</tr>
</tbody>
</table>

**EXISTING STRUCTURE TYPE**

<table>
<thead>
<tr>
<th>Bridge</th>
<th>Box Culvert</th>
<th>Open Foot Culvert</th>
<th>CSP</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>Size: (w x h) m²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SECTION TYPE AND MORPHOLOGY**

<table>
<thead>
<tr>
<th>Section (Reach) Identifier:</th>
<th>Section Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-50 m downstream of proposed road</td>
<td>0-50 m downstream of proposed road</td>
</tr>
<tr>
<td>Associated Wetland:</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stream / River</th>
<th>Channelized</th>
<th>Permanent</th>
<th>Intermittent</th>
<th>Ephemeral</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Total Section (Reach) Length (m):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sub-Sections:</th>
<th>Run</th>
<th>Pool</th>
<th>Riffle</th>
<th>Flats</th>
<th>Culvert</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of Area:</td>
<td>10</td>
<td>&lt;5</td>
<td>5</td>
<td>85</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean wetted depth (m):</td>
<td>0.08</td>
<td>0.4</td>
<td>0.2</td>
<td>022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean wetted width (m):</td>
<td>1.5</td>
<td>1.6</td>
<td>0.8</td>
<td>1.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean bankfull depth (m):</td>
<td>1.0</td>
<td>1.7</td>
<td>1.0</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean bankfull width (m):</td>
<td>2.5</td>
<td>3</td>
<td>2.5</td>
<td>3.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Substrate (type & %)

<table>
<thead>
<tr>
<th>Substrate</th>
<th>Bedrock (Br)</th>
<th>Boulder (Bo)</th>
<th>Cobble (Co)</th>
<th>Gravel (Gr)</th>
<th>Sand (Sa)</th>
<th>Silt (Si)</th>
<th>Clay (Cl)</th>
<th>Muck (Mu)</th>
<th>Detritus (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Bank Stability

<table>
<thead>
<tr>
<th></th>
<th>Stable</th>
<th>Slightly Unstable</th>
<th>Moderately Unstable</th>
<th>Unstable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left Bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Right Bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Habitat

#### In-Stream Cover (% surface area):

<table>
<thead>
<tr>
<th></th>
<th>Undercut banks:</th>
<th>Boulders:</th>
<th>Cobble:</th>
<th>Organic Debris:</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vascular Macrophytes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Instream:</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overhanging:</td>
<td>&lt;5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|                |          |      |       |               |      |
| Woody Debris:  |        |      |       |               |      |
| Instream: | 5       |      |       |               |      |
| Overhanging: |        |      |       |               |      |

### Shore Cover (% stream shaded):

<table>
<thead>
<tr>
<th></th>
<th>100-90%</th>
<th>89-60%</th>
<th>59-30%</th>
<th>29-1%</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O</td>
<td>⬤</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

---

Page 3 of 5
### Vegetation Type:

<table>
<thead>
<tr>
<th>Vegetation Type (%)</th>
<th>Submergent</th>
<th>Floating</th>
<th>Emergent</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predominant Species:</td>
<td></td>
<td></td>
<td></td>
<td>0%</td>
</tr>
</tbody>
</table>

### Migratory Obstructions

<table>
<thead>
<tr>
<th></th>
<th>Permanent</th>
<th>Seasonal</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>water level in spots</td>
<td></td>
</tr>
</tbody>
</table>

### Potential Critical Habitat

<table>
<thead>
<tr>
<th></th>
<th>Spawning</th>
<th>Groundwater</th>
<th>Other</th>
</tr>
</thead>
</table>

### Potential Enhancement Opportunities

- Clean up debris
- Banks undercut on both sides of 1.3m diameter culvert
**ADDITIONAL COMMENTS**

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within proposed road</td>
<td>1.4W, 1.5H, no aquatic veg clay 50%, silt 30%, gravel 20%</td>
</tr>
<tr>
<td>Riparian cover</td>
<td>50% silt, banks stable, no special habitat or fish barrier</td>
</tr>
<tr>
<td>Overhanging veg</td>
<td>1%, 95% at 5m run</td>
</tr>
<tr>
<td>0-20 vs - run</td>
<td>70</td>
</tr>
<tr>
<td>Flat</td>
<td>10</td>
</tr>
<tr>
<td>riff 10</td>
<td>5m length, within a 1.3 m diameter metal culvert with a</td>
</tr>
<tr>
<td>Wetted width</td>
<td>0.5m - 1m, and depth of 0.17m. Grass on top of culvert, access over watercourse</td>
</tr>
<tr>
<td>20m - 50m vs of proposed road</td>
<td>mean width 1.3m, mean depth 0.7m</td>
</tr>
<tr>
<td>Flat &amp; run morphology, substrate clay, silt gravel eddies (5%), 80%+ riparian cover</td>
<td></td>
</tr>
</tbody>
</table>

Additional Notes Appended? | Yes
---|---
Number of Pages | 2

No fish observed or collected: Maltech backpack electrofisher - 60 Hz, 150V, 993 sec
Electrofished site, 105m length, 50m downstream of proposed road to ~13m upstream of proposed road (existing culvert), 4 ~ 30m upstream of existing culvert.
<table>
<thead>
<tr>
<th>SECTION IDENTIFIER:</th>
<th>SECTION LOCATION:</th>
<th>SECTION LENGTH (m):</th>
<th>SCALE (cm / m):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proposed road</td>
<td>~ 5.5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROJECT #:</th>
<th>11115032</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MAPPER:</td>
<td>A. Bacteriologic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NAME OF WATERBODY:</td>
<td>Watercourse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CROSSING #:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STATION #:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATE: YY-MMM-DD</td>
<td>2020-MAR-19</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LEGEND**

- 10d depth (cm)
- 6w width (cm)
- → Riffle
- → Run/Glide
- ○ Pool
- ■ Island/Bar
- #: Fine Substrate
- #### Gravel Substrate
- oOooO Cobble/Boulder
- *** Debris
- CT Cattail
- SV/FV Submerg/Float Veg
- EV Emergent Vegetation
- W Watercress
- Fe Iron Staining
- """""""" Eroded Bank
- XXX Riprap/Other Stabilization
- ○ Instream Log/Tree
- ▲▲▲ Dam/Weir/Obstruction
- ◐ Riparian Tree
- ▲► Seep/Spring
- ——— Undercut Bank
- —— Barrier to Fish Movement
- -S- Seasonal Barrier
- -x-x- fence line
- □ Culvert

**PROFILE:**

<table>
<thead>
<tr>
<th>Horz. Scale</th>
<th>Vert. Scale</th>
</tr>
</thead>
</table>

Page 7
Appendix B
Culvert Drawing