



March 30, 2023

Shoreham Development Limited

Attention: Mr. M. Sooriyakumaran, email: soori@ckm.ca

**Subject: Preliminary Wetland Delineation Survey
Civic Nos. 1226 Cole Harbour Road, and 73 and 77 Bissett Road (PID Nos. 00403014,
00402453 and 00402768), Cole Harbour, NS
Englobe reference: 2109987.000**

Mr. Sooriyakumaran:

A Preliminary wetland identification and delineation survey was conducted by Englobe Corp. (Englobe) on the properties identified as Civic Nos. 1226 Cole Harbour Road, and 73 and 77 Bissett Road (PID Nos. 00403014, 00402453 and 00402768, respectively) in Cole Harbour, Nova Scotia. The purpose of the survey was to conduct field verification for potential wetlands, with delineation of the boundaries if present, at the above-noted properties prior to a proposed development.

1 General Overview of Wetland Determination Procedure

Wetland assessments begin with a review of available desktop information including various aerial images and maps, followed by fieldwork to ground-truth the desktop findings. Wetlands are determined by Englobe using procedures developed by the US Army Corps of Engineers, adapted for the Northeast and North Central regions of the US, and endorsed by Nova Scotia Environment and Climate Change (NSECC). The determination procedures follow a three-parameter approach, using indicators established for vegetation, soils and hydrology to identify the presence of wetlands.

Wetland boundaries are initially identified through visual assessment of vegetation and hydrology. Dominant vegetation in each stratum (tree canopy, shrub and herbaceous layers, if present) is identified using appropriate regional field guides and a Dominance Test worksheet and are assigned their appropriate wetland indicator status for this region. This work identifies whether the dominant vegetation is that which thrives in, or is at least tolerant of, prolonged wet conditions during the growing season. A visual assessment for primary indicators of wetland hydrology (e.g., inundation, water stained leaves) is also conducted during the vegetation survey. This work looks for direct signs of prolonged wet conditions. The visual boundary is then verified through manual excavation of shallow test pits (shovel pits) or auger holes. Soil profiles are examined, and soil properties referenced against the Northeastern US Hydric Soil Indicators with Probable Application in Nova Scotia document to determine if they meet the wetland soils criteria. The shovel pits or auger holes are also examined for additional signs of wetland hydrology (e.g., soil saturation, standing water in the holes, soil that has reduced iron and/or oxidized rhizospheres, etc.). Where all three parameters (vegetation, soil and hydrology) satisfy the wetland criteria, the area is considered wetland.

As the wetland boundaries are identified in the field following this three-parameter approach, the boundary points are recorded using a GPS instrument with an accuracy of 5m or less. The unit generally provides sub meter accuracy, but accuracy can range from 1 to 5 m. Flagging tape is typically hung along the wetland boundary so that surveyors can map the wetlands with higher accuracy.

The official field season for NSECC approved wetland delineation is June 1 to September 30. All wetland work that ultimately will result in a regulatory submission to NSECC must be completed in this growing season or have a follow up visit to confirm that earlier work outside this season remains valid. Given your time constraints, we used our professional judgement to offer an opinion as to whether these development constraints exist before the growing season officially starts. However, if there is an intention to alter wetlands at the site it is recommended to conduct an additional vegetation assessment during NSECC's prescribed period.

2 Site Description

The current area of interest is identified as Civic Nos. 1226 Cole Harbour Road, and 73 and 77 Bissett Road (PID Nos. 00403014, 00402453 and 00402768, respectively) in Cole Harbour, NS. The irregular-shaped parcels together have a land area of approximately 8.30 hectares (20.52 acres) and are located on the south side of Cole Harbour Road and the west side of Bissett Road. Civic Nos. 73 and 77 Bissett Road are occupied by two residential dwellings (one on each property), both near the eastern boundary of the properties. The remainder of the properties including Civic No. 1226 Cole Harbour Road are undeveloped and vegetated. The general site location is provided below in Figure 2-1. A wetland sketch is also provided as Figure 1, Appendix A.

Figure 2-1 Site Location



3 Investigation Results

Based on a review of historic aerial imagery and topographic mapping, the residential dwellings at 73 and 77 Bissett Road have been present since prior to 1964 in the far eastern portions of those properties, with most of the properties' area remaining undeveloped. Around 1983, development of 1226 Cole Harbour Road began, with significant infilling and roadways for a future development being constructed; however, it appears this development was never completed. The on-site wetland on the northwestern corner of 1226 Cole Harbour Road was visible by 1992. The property was later occupied by a driving range and mini-putt business until sometime between 2005 and 2010. According to a review of Google Earth Images, between 2005 and 2010 the on-site vegetated areas changed on the southern properties, showing signs of stressed vegetation. Currently, the areas of stressed vegetation (dead trees) are present and seem to roughly coincide with the location of the on-site wetland area at 73 and 77 Bissett Road.

After review of available background information, field reconnaissance to ground-truth the presence or absence of wetlands was conducted on September 13 and 16, 2021 (for 1226 Cole Harbour Road) and December 15, 2022 (for 73 and 77 Bissett Road). At various areas within the site, Englobe evaluated the wetland determinants - vegetation, soil and hydrology. Due to the timing of the second assessment after the seasonal die-down of herbaceous plants, specific vegetation was not able to be identified at the Bissett Road sites. Nonetheless, we used our experience and judgement when considering the other wetland evidence and making our determination. Site photographs are attached (Appendix B).

Two wetlands, identified as 'Wetland 1' and 'Wetland 2' in this report and associated appendices, and two watercourses were observed in the study area. The approximate wetland and watercourse locations are provided on Figure 1, Appendix A. It should be noted that the wetland and watercourse locations shown on Figure 1 are approximate, and have been determined using our professional judgement and the constraints associated with this time of year.

Wetland 1 is located in the northwestern corner of Civic No. 1226 Cole Harbour Road and was delineated on September 16, 2021. The wetland was identified as a ponded wetland with an intermittent inlet from the east from a drainage feature. No distinct outlets were observed; however, the wetland may discharge to or receive water from the large watercourse to the west in high flow periods. The wetland was dominated by duckweed (*Lemna sp.*), cattails (*Typha sp.*), asters (*Solidago sp.*) and woolgrass (*Scirpus cyperinus*) in the inundated areas. Alders (*Alnus sp.*), rugosa rose (*Rosa Rugosa*) and multiflora rose (*R. multiflora*) were present on the fringes. Soils in Wetland 1 were generally saturated muck. The wetland was inundated. The approximate wetland size is 1,501 square meters.

Wetland 2 is located in the centre to western portions of the Bissett Road properties and was delineated (within the confines of the subject site) on December 15, 2022. The wetland was identified as a riparian swamp. It is bordered by a relatively large watercourse along the western boundary and a small tributary along the northwestern boundary (adjacent to PID No. 00403014). Soils in Wetland 2 were generally saturated muck. Saturation was observed within 5 cm of the ground surface. Standing water and stressed vegetation were noted throughout. The approximate on-site wetland size is 18,000 square meters. The wetland extends offsite to the south, but no attempt was made to delineate the wetland on others' properties.

The upland areas of the property were differentiated from the wetlands by the topography, changes in vegetation community, and hydrology indicators (i.e. no standing water or saturation).

Based on available mapping, the watercourse along the western boundary of the site initiates off-site from the north, flowing north to south, eventually discharging into Bissett Lake. The tributary along the

northwestern boundary of Wetland 2 is a branch of the other, larger, western watercourse. No attempt was made to assess or survey any potential watercourses outside of the subject wetlands.

4 Conclusion

Two wetlands (and associated watercourses) were observed within (or partially within) the bounds of the study area, shown in the site sketch provided (Figure 1, Appendix A). Wetland 1 is a relatively small wetland in the northwestern corner of 1226 Cole Harbour Road. Wetland 2 is a larger wetland at 73 and 77 Bissett Road that is bordered by watercourses on the western and northwestern boundaries, and Wetland 2 appears to extend beyond the subject site to the south.

If there is an intention to alter wetlands at the site, it is recommended to conduct a vegetation assessment during NSECC's prescribed growing season period of June 1 to September 30. Wetland alteration applications require additional detailed assessment, including functional assessment following the Wetland Ecosystems Services Protocol - Atlantic Canada (WESP-AC), and compensation to support the applications. Additional study of any associated watercourses may also be required to support wetland alteration applications.

5 Report Use and Conditions

This report was prepared for the exclusive use of Shoreham Development Limited, and is based on data and information obtained during site visits by Englobe on the subject properties, and is based solely upon the condition of the properties on the dates of such inspection, supplemented by information obtained and described herein.

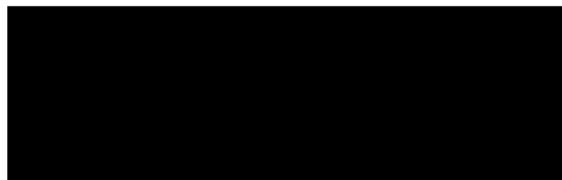
In conducting this wetland delineation assessment, Englobe reviewed available topographic information, traversed the land parcel and conducted site inspection of available vegetation, soil and hydrology conditions. The scope of work may not be sufficient to satisfy third parties. Any use that a third party makes of this report, or any reliance on or decision made based on it, is the sole responsibility of the third party. Englobe accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust the enclosed to your satisfaction. If, however, additional information should be required, please communicate with the undersigned.

Yours very truly,
Englobe Corp.



Lauren Bowser, B.Sc. Env.
Environmental Professional
Environmental Engineering



Doreen Chenard, B.Sc. in Agr.
Technical Director
Environmental Engineering

APPENDICES

Appendix A

Wetland Sketch

Appendix B

Site Photographs

Appendix A

Wetland Sketch





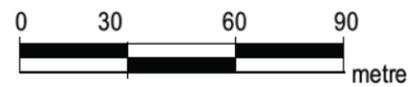
LEGEND:

- - - Subject Properties
- Delineated Wetland
- ~ Watercourse

NOTE:

- Wetland delineation undertaken within subject site only; wetland may extend offsite.

Shoreham Development Limited



Scale 1:2000

Preliminary Wetland Delineation

PID Nos. 00402453 and 00402768
Cole Harbour, NS

Wetland Sketch



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Appendix B

Site Photographs





Photo 1: Wetland 1 in the northwestern corner of Civic No. 1226 Cole Harbour Road.

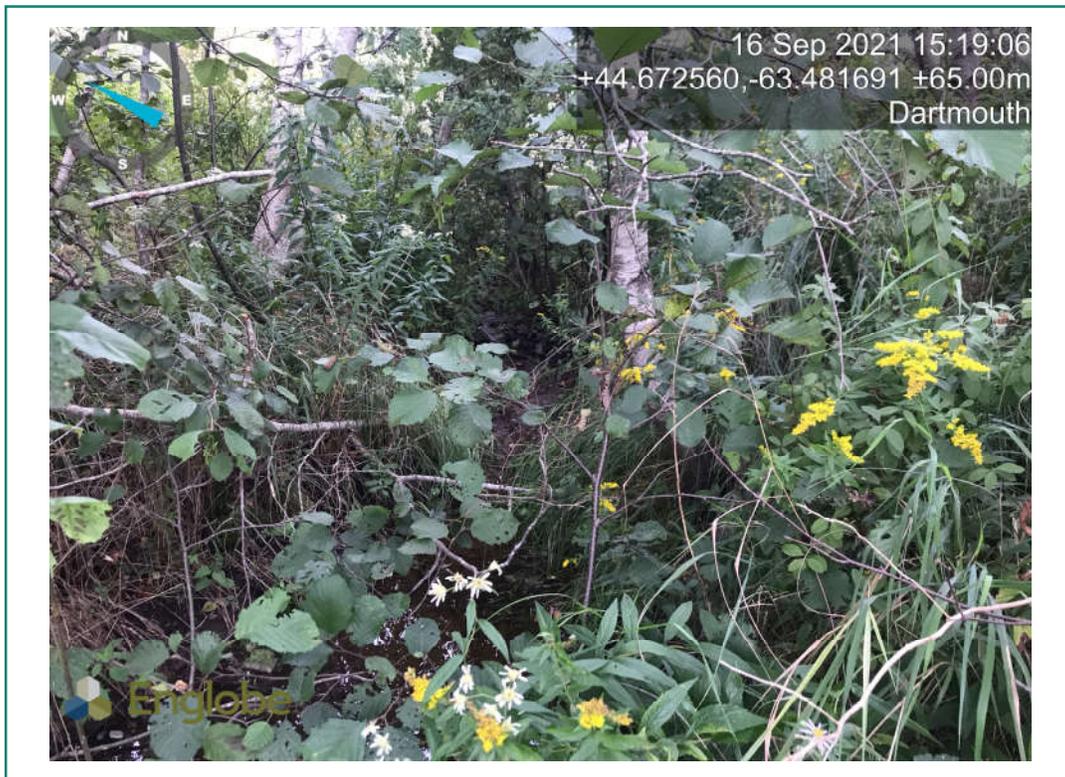


Photo 2: Possible inlet/outlet to the large watercourse west of Wetland 1.



Photo 3: Wetland 2 in the centre portion of Civic Nos. 73 and 77 Bissett Road.



Photo 4: Auger sample of the saturated muck in Wetland 2.



Photo 5: Standing water in Wetland 2.



Photo 6: A portion of the small tributary along the northwestern boundary of Wetland 2.



Photo 7: A portion of the large watercourse along the western boundary of Wetland 2.



Photo 8: Upland area in the eastern portion of Civic Nos. 73 and 77 Bissett Road.